Chapter 1

Summary and Findings

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Chapter 1
Summary and Findings

INTRODUCTION

The dissolution of the Soviet Union and the end of the Cold War have profoundly changed U.S. defense needs. Just what a prudent U.S. national defense system will be in the post-Cold War era is not yet clear. But it will almost certainly require less money and fewer people than it did in the 40 years when this Nation faced a hostile and obdurate military superpower with a huge army poised at the borders of Western Europe. Welcome as these changes are, they have serious implications for the people, companies, and communities that have depended on defense spending for their livelihood. The changes also raise some potentially troubling questions about adjustment for the Nation as a whole.

Compared to the size of the national economy, the current cutbacks in defense spending do not loom very large. Even at the height of the Reagan buildup, defense spending never reached as big a share of gross national product (GNP) as in the Korean or Vietnam Wars, not to mention World War II, nor has the decline so far been as steep as in those earlier eras (figure 1-1). It is quite conceivable that retrenchment will go farther than either the Congress or the President has yet contemplated-perhaps far enough to cut another 40 percent from defense spending by the year 2001[1] (figure 1-2). That would accelerate the build-down and drop defense spending, in constant dollars as well as share of GNP, to the lowest levels in half a century; it would also mean bigger impacts on defense workers and communities than those envisioned so far. Even so, the decline would average out to about $12 billion a year (1991 dollars) over 10 years--not a huge amount in an economy running at $5.5 to $6 trillion a year. Defense-related employment in defense industries, civilian jobs in the U.S. Department of Defense (DoD), and the armed forces might drop from 6.0 million in 1991 to as low as 3.5 million a decade later, or an average of 250,000 a year[2] (figures 1-3 and 1-4), a substantial number, but only about 0.2 percent of the 119 million jobs in the U.S. economy in 1991.

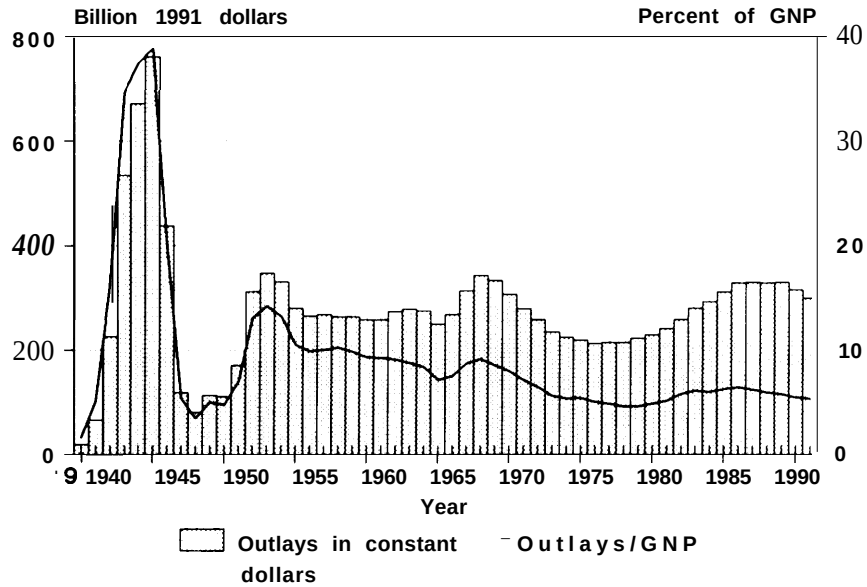
Several cautions should be noted. First, the decline may not be gradual; steep cutbacks could occur in single years, making adjustment more difficult. Moreover, effects in some localities will be much more troublesome than the aggregate figures suggest. Approximately one-half of the defense-related jobs within the United States are in eight States, and within the States certain local areas are exceptionally dependent on defense employment. For example, up to one in five workers in the Norwich-New London labor market of southeastern Connecticut hold defense-related jobs, and many more are in service, transportation, and commercial jobs that serve the everyday needs of these workers. It is in these defense-dependent communities that reductions in defense spending can hurt most. Without detailed analysis at the local level, it is impossible to say just how many American communities are highly defense-dependent, but a rough estimate (based on the value of prime defense contracts per capita and the presence of military bases scheduled for closure) is 160 of the Nation's 3,137 counties.

Some defense-dependent communities might still escape serious problems if their local economies are strong and diverse enough to take up the slack. Also, the adjustment programs discussed in this report—

[1]This figure is based on the estimate of Department of Defense (DoD) spending at a level of $169 billion (1991 dollars) in 2001, as presented in William Kauffman and John Steinbruner, *Decisions for Defense (Washington DC: The* Brookings Institution, 1991). The Kauffman-Steinbrunner estimate is chosen for illustrative purposes because it is near the low end of well-informed estimates. A panel of the Electronic Industries Association (HA) forecast in September 1991 that the DoD budget in 2001 would be between $160 billion and $240 billion, with the most likely level at about $208 billion; this panel's forecasts are well-regarded because they have proved reasonably accurate in the past. See Electronic Industries Association Government Division/Requirements Committee, Ten Year Forecast Subcommittee, Defense *Electronics Market: Ten-Year Forecast, U.S. Department ofDefense and National Aeronautics and Space Administration Budgets, FY1992 to FY2001* (Washington, DC: 1991). For a discussion of future defense needs and the industrial base required to support them, see U.S. Congress, Office of Technology Assessment, *Redesigning Defense: Planning the Transition to the Future U.S. Defense Industrial Base,* OTA-ISC-500 (Washington, DC: U.S. Government Printing Office, July 1991).

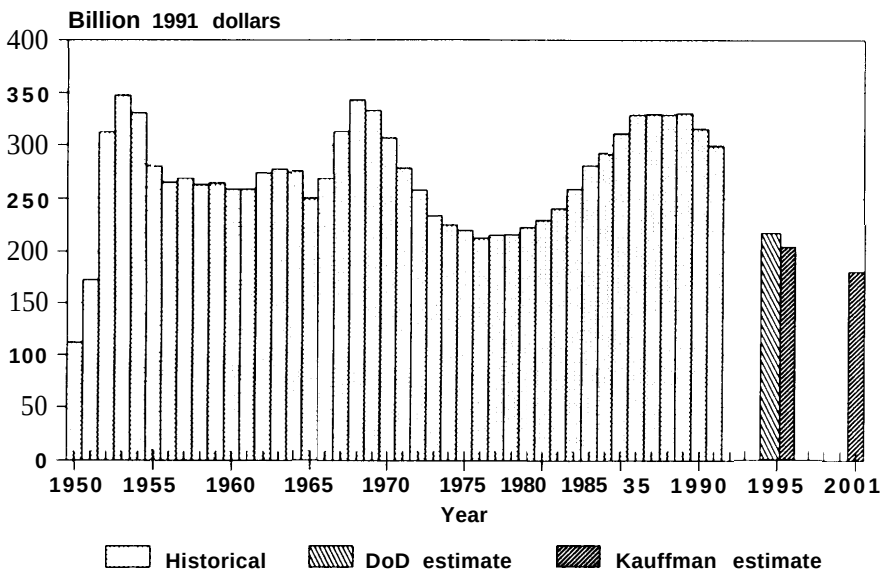
[2]Based on the Kauffman-Steinbruner projection of DoD spending of about $169 billion a year in 2001, OTA estimates that the active duty military forces would number 1.34 million, DoD civilian employment 700,000, and jobs in the defense industries 1.50 to 1.62 million. The total decline in defense-related jobs from 1991 to 2001 would be 2.3 to 2.5 million (see table 1-1 and the discussion in ch. 3). This figure is for positions lost; as discussed below, actual job loss in the active duty armed forces and in DoD civilian employment is likely to be substantially lower.

Figure I-l—Defense Spending, 1940-91



SOURCE: Steven Alexis Cain, *Analysis of the #' 1992-93 Defense Budget Request, With Historical Budget Tables* (Washington, DC: Defense Budget Project, February 1991).

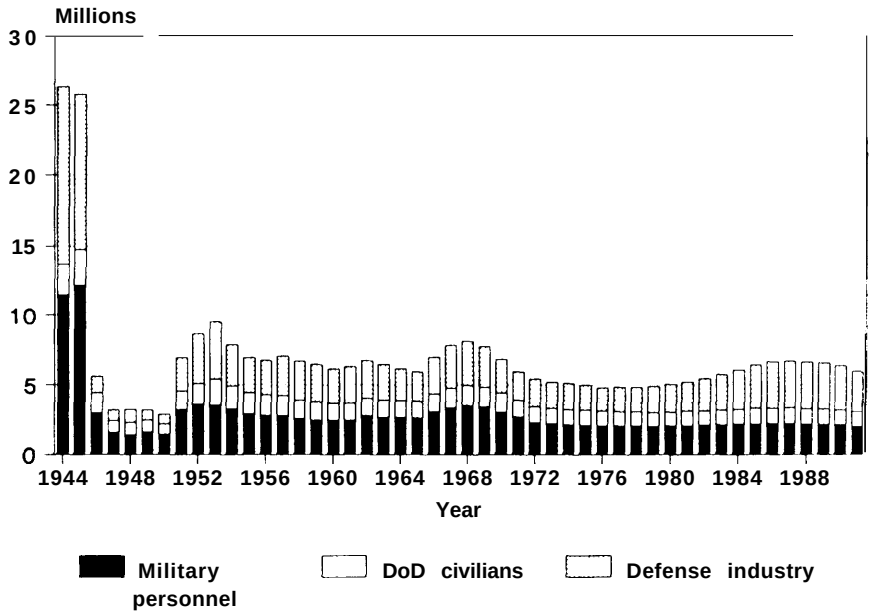
Figure 1-2—National Defense Spending, 1950-2001



SOURCES: Steven Alexis Cain, Analysis *of the FY 1992-93 Defense Budget Request, With Historical Budget Tables* (Washington, DC: Defense Budget Project, February 1991); and OTA projections based on Kauffman, see note to table 1-1.

retraining and reemployment help for displaced workers and veterans of the armed services, local and regional economic development efforts, assistance to firms converting to civilian production--can contribute to a smoother transition. However, if the national economy falters, these moderating influences could count for little. Adjustment problems that are manageable in good times are much more serious matters in a stagnant or recessionary economy, when even small losses in demand can

Figure 1-3-Defense Employment Levels, 1944-91



SOURCE: Department of Defense, Office of the Comptroller, *National Defense Budget* Estimate *for FY* 1992 (Washington, DC: March 1991).

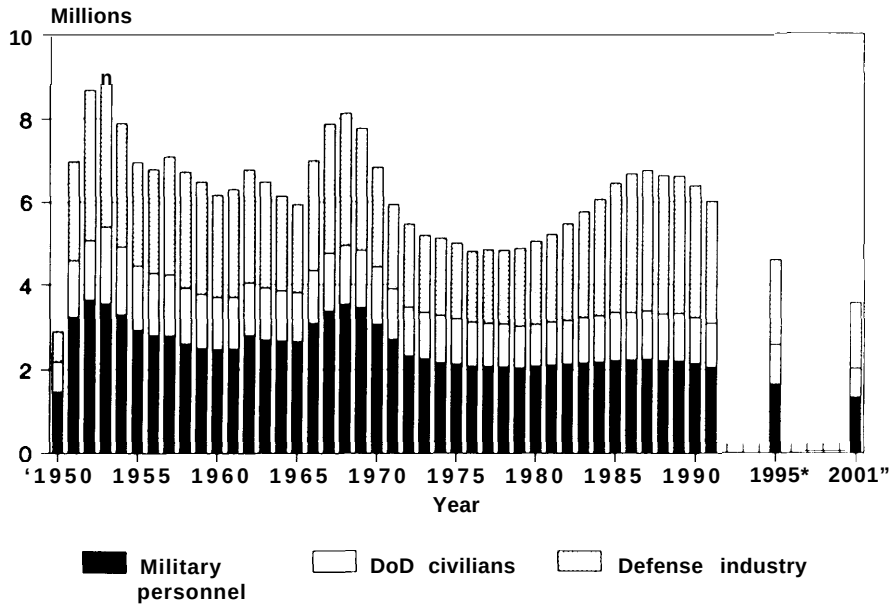
aggravate a downward spiral. While a strong recovery from the 1990-91 recession may yet happen, there were few signs of it at the end of 1991.

More fundamentally, the U.S. economy is not as robust as in earlier defense build-downs. Twenty years ago, the United States was still the world's dominant economic power. Now, it is under challenge as never before from extremely able foreign competitors (principally Japan). U.S. commercial manufacturing in particular is under siege, and will be hard put to take the place of defense industries, which are heavily tilted to manufacturing. Declines in manufacturing are especially costly to the Nation because manufacturing provides well-paid jobs, supports most privately funded research and development (R&D), and dominates international trade.[3] The profile of job creation in the United States in the last decade has been skewed toward low value--added services with low pay, poor benefits, and little knowledge generation.

Other kinds of losses could also follow cutbacks in defense spending. During four decades of Cold War, national defense usually has had more money, prestige, and power than any other government activity, and it has taken on some important social and economic responsibilities beyond the strictly military. A prominent example is equal opportunity employment. The anneal forces have become the most color-blind large institution in the United States, providing opportunities for good jobs, good training, and advancement to high positions hardly available to minorities elsewhere. Another example is in technology advance. DoD pays for some R&D that has as much importance for commercial as for military purposes; moreover, defense purchases have sometimes launched whole new high technology industries (e.g., semiconductors and computers) and have contributed both new technology and financial stability to others (aircraft). Granted, military spending is an expensive, unreliable, and unfocused way of providing support to technologies and industries of great commercial importance, but we have relied on it for many decades. If national defense shrinks as an exemplary source of jobs for minorities, if its support for the generation of

[3]For a discussion of the place of manufacturing in the national economy and international trade, see U.S. Congress, *office* of Technology Assessment, *Paying the Bill: Manufacturing and America's Trade Deficit*, OTA-ITE-390 (Springfield, VA: National Technical Information Service, June 1988). For analysis of the competitive situation of American manufacturing, see *Making Things Better: Competing in Manufacturing*, OTA-ITE-443 (Springfield, VA: National Technical Information Services, February 1990); and *Competing Economies: America, Europe and the Pacific Rim*, OTA-ITE-499 (Washington, DC: U.S. Government Printing Office, October 1991).

Figure 1-4-Defense Employment Levels, 1950-2001



SOURCES: Department of Defense, Office of the Comptroller, *National Defense Budget Estimate for FY* 7992 (Washington, DC: March 1991). Future year estimates by OTA, see note to table 1-1.

advanced technologies and industries declines, and if no other institutions are created to take on these responsibilities, then the Nation will be the poorer.

MACROECONOMIC EFFECTS: A HISTORICAL PERSPECTIVE

After World War II

In **the** past half century, by far the greatest adjustment to a fall in defense activity was the shift to a peacetime economy after World War II. By 1948, defense spending fell from a wartime peak of 38.7 percent of GNP to 3.2 percent, 12.4 million people left employment in defense industries, 10.6 million were discharged from the armed services, and 1.8 million left civilian defense jobs (figures 1-1 and 1-3). This huge adjustment was made with little difficulty; indeed it ushered in a period of growth and prosperity.[4] In hindsight, it might seem obvious that consumers' wartime savings and pent-up demands, private firms retained war profits, and lower taxes would provide enough economic stimulus to avert community dislocations and unemployment, but it was not so clear at the time, when memories of the Great Depression were still fresh.

In addition, some credit for easing the adjustment is due to government foresight in planning for the transition, or "reconversion" as it was then called.[5] As early as 1943, Federal procurement agencies and the Office of War Mobilization were preparing for speedy termination of contracts when the war ended. Included in the scheme were advance agreements with contractors on how to handle termination and, most important, partial payments to contractors-up to 90 percent of their claims-pending final settlement. The partial payments were a vital source of working capital for many contractors, especially smaller ones, during reconversion.[6]

Government tax policy also contributed to companies' ability to retool and quickly swing into

[4]Real (constant dollar) GNp actually declined every year from 1944 through 1947, most steeply in 1946. However, the main reason for this decline was the changeover to civilian production and the rapid departure of women from the labor force. Unemployment rose from the extraordinarily low point of 1.2 percent in 1944, but only to about 3.9 percent in the years 1946-48; this compares to 14.6 percent in 1940 and 9.9 percent in 1941,

[5]Material on government policies easing reconversion after World War II is drawn largely from Jack Stokes Ballard, The Shock *of Peace* (Washington, DC: University Press of America, Inc., 1983), pp. 132-136.

[6]Ibid, p.136. Congress rejected advice from the Comptroller General to delay payments pending a review and audit of settlements by his office, on the grounds that this would freeze billions in working capital and "would mean unemployment by audit."

postwar civilian production. During the war, companies were allowed to charge off new investments in plant and equipment in just 5 years. This liberal amortization fattened record wartime earnings, and because managers generally kept a large share of the earnings in reserve rather than paying them out to stockholders, many companies were able to finance internally their postwar investment needs. At the same time, banks were overflowing with individuals' wartime savings, and were eager to lend to industry. The ample supply of capital drove interest rates to historic lows, which encouraged further investment.

Many companies—perhaps as many as 80 percent -did not even need to retool for the first wave of postwar production. They simply took their prewar machines out of storage and put them back into service in a matter of weeks. General Motors, for example, started producing its prewar models within a couple of months of the war's end. However, some industries (e.g., aluminum, magnesium, and above all, the aircraft industry) faced a glut of production capacity. Postwar unemployment of ex-aircraft workers might have been a real problem, since the industry's jobs had surged from 40,000 in 1939 to 2 million in 1944.

Yet it didn't happen. Although there were no special programs for reemployment and retraining of war production workers, the prompt revival of the auto and other civilian industries opened up millions of jobs. At the same time, many people withdrew from the labor force—a total of about 3 million older workers who normally would have retired if not for the war and younger people who would have stayed in school. Moreover, some 2.7 million women dropped out of the work force between 1944 and 1947. The decline of the average work week from over 45 to 42 hours also eased the transition to civilian employment.

For the millions of returning service men and women, the main adjustment program was the GI Bill. It offered unemployment benefits for a full year; government-guaranteed loans for home, farm, or business; and, most remarkably, financial support for 4 full years of education or training. All this enabled 11 million veterans to reenter the labor market gradually. An estimated 1.7 million ex-service men and women did not immediately look for jobs, and 800,000 enrolled in college in 1946. The programs gave veterans and their families about $20 billion in Federal money over 3 years, supplemented by more than $1.5 billion in State bonuses.[7]

In sum, macroeconomic factors--especially the high business and personal savings during the war and the prompt use of them afterwards, both for investment and for personal consumption—were central to the surprisingly trouble-free conversion after World War II, Government adjustment policies helped. Veterans were given generous choices for reentry to the civilian world, and industry got favorable tax treatment for investment during the war, plus fast, liberal contract termination and disposal of government property afterwards. The phrase "back to business" and the term "reconversion" sum up one more reason for the ease of the transition. There was no large, permanent defense industry in 1945 as there is today after 40 years of Cold War. Civilian production and civilian jobs were the norm for nearly everyone, and people couldn't wait to get back to them.

After the Korean War

Adjustment after the Korean War was a much smaller but rougher affair. Defense spending as a share of GNP fell from 13.4 percent in 1953 to a post-Korea low of 9.4 percent in 1956-still more than double the share in 1948. As figure 1-1 shows, defense spending never afterwards dropped as low as it had been before the Korean War, either in constant dollars or as a share of GNP. Nor did defense employment ever again fall so far (figure 1-3), though it did drop substantially from 1953 to 1956-by 1.6 million in defense industries, 750,000 in the active military services, and 150,000 in civilian DoD jobs. The difference was the onset of the Cold War and the scaling up of American military power to face the Soviet Union. The cutback after the Korean War was to a level that became the Cold War norm.

Despite the higher floor for defense spending and the comparatively moderate size of the adjustment, experience after Korea was bumpier than after World War II. The economy stalled into recession in 1954 and following a brief recovery grew sluggishly in 1956 and 1957; 1958 brought another recession

[7] Ibid., p. 201.

year. Unemployment rates climbed during the period and spiked to 6.8 percent in 1958.

Government macroeconomic policy was a major cause of the postwar recessions. No fiscal policies were adopted to offset the decline of military spending. Federal spending was cut by 10 percent between 1954 and 1957 (in constant dollars). Meanwhile revenues rose, producing budget surpluses in 1956 and 1957 and a consequent deflationary effect. Unlike the situation after World War II, there was no economic stimulus from pent-up consumer demand, since the Korean War had cut very little into consumption. No special government programs were adopted to help defense companies or workers adjust, but returning veterans got much the same provisions as World War II veterans (the GI Bill, guarantees of former jobs, and preference for civil service jobs).

Altogether, the strains in the post-Korean War transition were felt rather generally throughout the economy instead of being concentrated in particular sectors. Within the defense industry, producers of conventional battlefield equipment, such as guns and ammunition, felt the cutbacks most, but some defense sectors suffered very little, or even grew with the Cold War buildup. Military aircraft prospered. The Eisenhower administration emphasized strengthening the Air Force, and by 1955 aircraft purchases were three-fifths of defense procurement. The increasing complexity of weapons required for a strategic intercontinental vigil, rather than for conventional battles in the field, contributed to the growth of a dedicated defense industry-as President Dwight D. Eisenhower recognized in his farewell address, when he cautioned the Nation about the growing power of the military-industrial complex.

After the Vietnam War

The experience after the Vietnam War was uneven, but was especially harsh on the aerospace industry and the communities dependent upon it. Although defense spending was $342 billion (1991 dollars) at its height in 1968-about the same as the high point of Korean War spending-it was never as prominent apart of GNP as in the Korean War, and the decline was more gradual--from 9.6 percent of GNP in 1967 to 5.6 percent in 1974. From 1%8 to 1974 employment in defense industries dropped by 1.4 million, armed forces strength by 1.4 million, and DoD civilian employment by 250,000. These declines reflected not only the progressive disengagement from Vietnam during the Nixon years, but also the Nixon-Kissinger policy of detente with the Soviet Union.

Mindful of the two recessions, slow growth, and rising unemployment after the Korean War, the Johnson administration had planned compensatory fiscal policies-a modest tax cut combined with public sector spending-to spur continued expansion after the Vietnam War. However, the Nixon administration, taking office in 1969, rejected these policies in favor of fiscal restraint to counter inflation; the $25-billion Federal deficit of 1968 was turned into a $3-billion surplus in 1969. The sharp but brief recession of 1970-71 followed. Then, a turnaround to more expansionary fiscal and monetary measures helped to bring about 2 years of strong recovery. The leading cause of the much deeper 1974-75 recession was the oil price shock, although continuing declines in defense spending may have aggravated the downturn.

Throughout the post-Vietnam War retrenchment, even in years when the economy as a whole was booming, the cutbacks in military procurement were the direct cause of some crushing impacts on particular industries and regions. Defense reductions, combined with a steep drop in orders for commercial aircraft and reductions in the space program, led to severe shrinkage in aerospace production and employment. For example, jobs at the Boeing aircraft company in the Seattle area dropped from more than 100,000 in the late 1960s to about 30,000 in the mid- 1970s. This was the time when aerospace engineers were driving taxicabs and the wry joke in Seattle was, “Last one out turn off the lights. ”

When the defense spending reductions of the period began, there were few Federal Government adjustment programs to soften the effects. However, regional distress and rising unemployment led the Nixon administration to create an interagency Economic Adjustment Committee, and expand a small existing office within DoD (the Office of Economic Adjustment) whose job was to help communities plan for adapting to lower defense spending. A new $28-million job development and training program was targeted to scientists, engineers, and technicians. In addition, some States and localities encouraged initiatives by large companies to change

product lines and enter civilian markets-efforts that mostly ended in failure. Recovery of the aerospace industry and the regions in which it was concentrated began with an upswing in commercial aircraft orders in the late 1970s and was bolstered by the military spending of the 1980s.

Structural Changes in the Civilian Economy

The most disruptive regional stresses of the past half century were not related to defense cutbacks, but rather to structural changes in the civilian economy. The departure of the textile industry from New England, the collapse of coal mining in Appalachia, the exodus of farm workers from the land after World War II, and the disappearance of 1.7 million manufacturing jobs from the nation's economy in the 1980s (jobs in basic steel alone dropped from 570,000 to 330,000 from 1979 to 1984, and continued to decline through the decade)-all of these structural changes caused massive dislocation of workers and some brought about deep, long lasting decline of communities. Some of the communities have never recovered. Some of those that made a comeback+. g., New England—took a generation to recover, and owed much of the recovery to DoD spending. Indeed, declines in defense spending, coinciding with a crash in the finance and construction sectors and a downturn in the market for high-tech products, pushed much of New England into an earlier and deeper recession than the rest of the country experienced in 1990-91.

Note that these severe regional stresses, related to declines of particular industries, did not necessarily coincide with economic distress in the Nation as a whole. The decline of Appalachian coal mining, New England textiles, and farm work in the rural South all went on for decades, through good times and bad. The downfall of basic steel and decay of communities in Pennsylvania's central valleys continued throughout the prosperous mid and late 1980s. When and if defense spending drops to a permanently lower level, the story might be the same in highly defense-dependent communities-severe, long lasting local effects but only minor impacts on the national economy.

For another perspective, the potential job losses due to defense cutbacks may be compared with actual worker displacement (mostly unrelated to defense) in the late- 1980s. Over the 5 years 1985-89, about 9.2 million workers lost their jobs due to plant closings or relocation, elimination of a position or shift, or slack work.[8] OTA estimates that over the 4 years 1991-95, 1.0 to 1.4 million positions could disappear in defense industries, the armed forces, and DoD civilian employment.[9] However, not so many people as that would actually lose their jobs. The armed services expect to handle at least three-quarters of their downsizing through attrition (accepting fewer new enlisters); similarly, attrition and a hiring freeze are expected to take care of at least half the decline in civilian DoD jobs. Assuming that the number of people actually losing their jobs in private defense industries would equal the positions lost in those industries,[10] the total number of displaced defense workers over the 4 years could amount to as much as 1.1 million, or an average of 275,000 a year.[11]

Compare this to the actual displacement of about 1.8 million workers per year, on average, from 1985 to 1989. Even in the good times of the late 1980s, "ordinary" displacement accounted for considerably more job loss than can be expected from defense cutbacks in the 1990s, based on a range of cutbacks that appear plausible. However, some of the late- 1980s displacement came from the normal

[8]The Labor Department's Bureau of Labor Statistics (BLS) oversees a special survey every 2 years of adult workers who have lost jobs for the reasons cited above. The BLS defines as 'displaced' workers who had 3 or more years tenure on jobs they lost in these ways. By this definition, some 4.3 million adult American workers were displaced in the 5 years 1985-89. In addition, 4.9 million adult workers who had held jobs for fewer than 3 years lost their jobs for the reasons cited. Public programs seining displaced workers make no distinction between workers who had longer or shorter tenure on their jobs (see ch. 3).

[9]Lower figures for positions lost (1.0 to 1.1 million) are based on the President's budget proposal for fiscal year 1992, which projected a 19 percent reduction in defense outlays from 1991 to 1995, The higher figures (1,3 to 1.4 million) are based on a trajectory that woutd cut defense outlays 41 percent from 1991-2001 (i.e., the Kauffman-Steinbruner projection of defense spending of $169 billion in 2001). See table 1-1. For details and an explanation of OTA's employment projections, see ch. 3.

[10]This will not necessarily be the case; some defense industries will find other customers to replace DoD sales, so job loss maybe less. On the other hand, the estimates of job loss for private industry do not include jobs generated by the pay of defense industry workers; this could be a considerable factor in some defense-dependent communities. It is assumed here that these two factors cancel each other out.

[11]This estimate includes 99,000 involuntary separations from the armed forces, 52,000 civilian DoD employees reduced in force, and 920,000 people losing defense-related jobs in private industry. The estimate assumes a rapid build-down (41 percent cut by 2001), and uses the high end of the range of OTA's estimate of defense industry positions lost (see table 1-1 and the discussion inch. 3).

churning of the U.S. economy—businesses failing and new ones starting up; not all of it represented the kind of permanent structural change, with long-term decline of certain industries, that can depress an entire region. Defense cutbacks are more akin to structural economic change; in some dependent communities they could have seriously disabling local effects over the long run. From the national point of view as well, defense-related displacement of 275,000 per year is a not inconsiderable addition to the 1.8 million otherwise displaced. The kind of jobs lost could make matters worse. By and large, defense jobs pay well, and in private industry are heavily tilted to manufacturing. For production and nonsupervisory workers, defense jobs provide substantial middle-class incomes and good benefits that are hard to find elsewhere in the American economy of the 1990s.

After the Cold War: The 1990s

Measured in constant dollars, U.S. defense spending in 1990 was extremely high by historical standards-nearly as high as at the peak of the Vietnam War (figure l-l). Even after a sizable cut in fiscal year 1991 (10.5 percent in real terms), the regular defense budget of $286 billion was still well above the Cold War floor of about $215 billion (1991 dollars) .12 In some ways, however, the prospects for a smooth transition looked better than in other defense build-downs since World War II. As a percent of GNP, defense spending was lower, and the rates of reduction—at least as proposed through 1993—were slower. By 1990, the defense budget had already declined 13 percent from its 1985 peak (an average yearly decline of 2.7 percent) with little apparent macroeconomic effect. Another positive factor is that many States now have economic development programs to help distressed communities get back on their feet. The Federal-State assistance program for helping displaced workers find or retrain for new jobs has several years' experience, and has scored worthwhile achievements in the States with the best programs.

Negative factors could offset some of these more favorable elements. First is the current state of the economy. Relatively small job losses that can be comfortably tolerated in a prospering economy are not so easily swallowed when growth is flat, still less during a recession. Assuming a job loss from defense cutbacks in the early 1990s of 275,000 per Year,[13] that figure amounts to only 0.2 percent of U.S. employment as of mid- 1991. But recession puts the number in a different light. Total U.S. employment declined 1.4 million from June 1990 to October 1991, while the number of unemployed climbed 2.1 million, to 8.6 million. In such circumstances, an additional loss of as much as 275,000 jobs in a single year could be stressful on the national scale.

There is no guarantee either that the rate of decline in defense-related employment will be gradual and fairly evenly paced. Estimates of yearly job loss usually assume a rough correspondence between reductions in national defense outlays and contraction in employment. This will not necessarily be the case. Major defense firms that become convinced of the reality of a steep continuing slide in contract money, with no prospect of new programs coming down the road, may decide to downsize quite radically and suddenly. Share prices of companies that shed employees often improve, so some firms may adopt this as an effective strategy for raising funds and beating out the competition. The result might be much higher job losses in a single year than the estimated annual average of as much as 275,000 over the 4 years 1991-95.

Another way of looking at the projected job losses is to compare them not with total employment, but with net job creation over a number of years. In the 1970s, the U.S. economy added some 20.1 million jobs and in the 1980s (when growth of the labor force slowed), 18.6 million. The loss over a decade of some 2.5 million positions in the defense sector looks larger in this perspective. Given intelligent handling of government fiscal policy, providing economic stimuli that produce jobs in other sectors, the transition should be manageable. But with a huge and increasing Federal debt, it is now more difficult to use fiscal policy to provide appropriate stimuli than in the past. Eventually, of course, one way or another, national economic growth will create new jobs to supplant the ones that go with defense spending; no one expects a permanent decline in the

[12] The costs of Desert Shield and Desert Storm are not included in the national defense budget, but have been estimated at $52 billion for fiscal years 1990 and 1991. Some of the cost, however, represented a drawdown of inventories (e.g., ordnance) that will not be replaced, and much of the rest was reimbursed by contributions from allied nations.

[13] Based on a cutback of DoD spending to $218 billion in 1995 and to $169 billion in 2001.

U.S. economy. However, the options of increasing government spending in other sectors, or lowering taxes, or both, that have eased some postwar adjustments in the past, are narrower now.

In several ways, in fact, important conditions that smoothed earlier transitions do not exist today. Unlike the situation after World War II (on the face of it, the largest transition), many defense companies and divisions of companies have no civilian business to go back to and no real abilities or interest in converting to civilian production. Even if they wanted to do so, many would lack the means. Major defense firms have loaded on debt to an exceptional degree in the past few years. In the economy as a whole sources for investment are thin. U.S. personal savings rates reached historic lows in the 1980s. Government dissaving (the huge deficits of the 1980s and 1990s) kept the steam up under interest rates.[14] And the need to get the deficit under control leaves less room than in former times for expansionary fiscal policies, should the government wish to use them to counteract recession, or for selected tax incentives to foster a more hospitable environment for investing in new technologies, new equipment, and new products.

The other, more optimistic, side of the coin is that the relative size of the adjustment is simply not as big as it was in past defense build-downs. Consider the reduction after the Vietnam War, up to now the most recent and the most similar in size and pace. From the peak year of the war, 1968 to the postwar trough in 1976, defense-related employment dropped from 8.1 to 4.8 million, plunging 1.8 million in just 2 years, 1969 to 1971. In 1987, at the height of the 1980s buildup, defense employment was 6.7 million. Assuming a large decline in defense spending (to an eventual total of $169 billion in 2001), defense-related jobs are estimated at 4.5 to 4.7 million in 1995, 8 years after the peak, with a maximum drop in defense-related employment of 1.5 million in the 4 years 1991-95.[15] Employment would eventually drop to 3.6 million in 2001, 14 years after the peak (figure 1-4). Considering that total U.S. employment is much larger in the 1990s than 20 years earlier (119 million in the recession year of 1991, compared to 81 million in 1971, when unemployment was also relatively high), it is clear that the present adjustment is smaller.

Another source of optimism is that there exist choices for government policies that could both ease the adjustment and build a stronger foundation for an expanding economy and rising incomes. There are possibilities for new public investments, in areas ranging from environmental protection to advanced transportation and communication systems, that could spur new technologies, support new businesses, and create new jobs. This report only touches on the possibilities; more will be said on the subject on the second and final report of this assessment.

LOCAL AND SECTORAL EFFECTS

Vulnerability to cutbacks of defense spending and jobs is concentrated in particular places and sectors. The best way to anticipate local impacts would be to pinpoint the effects of cancellations or steep cutbacks in big weapons programs or of military base closings on the people and communities where the weapons are produced or the bases located. For example, if production of the B-2 Stealth bomber stops at a handful, as now seems likely, Northrop, prime contractor for the B-2, may well have to close down an entire plant in Palmadale, CA and let thousands of workers go; Boeing, a major subcontractor for the B-2, could lose more thousands of jobs in its military division in Seattle.

For military base closings, there is likely to be enough advance warning that the communities and workers involved can plan ahead for ways to adjust to the losses. (The round of base closings that Congress agreed to in 1989 provided as much as 5 years' notice.) But planning for adjustment to cutbacks in weapons programs is less certain. First, the data needed are scattered and inadequate-not least because DoD does not collect data on defense subcontracts and because information on DoD's "black" programs, such as the B-2, is not made public. Second, which major weapons programs will be cut or canceled is speculative. As of late 1991, neither the administration nor Congress had undertaken the kind of comprehensive review of post-Cold War defense needs that could define the shape

[14]During the 1990-91 recession, the Federal Reserve Bank repeatedly lowered interest rates to stimulate recovery of a stagnant economy, However, as the economy recovers, pressures to raise interest rates will again increase.

[15]Note that 1.5 million is the projected loss in defense-related employment from 1991 to 1995. The number of job losers, or displaced defense workers, is expected to be less (about 1.1 million) because attrition will take care of some of the decline in employment.

of long-term reductions in the overall defense budget.

Other ways of estimating the vulnerability of particular workers, communities, and companies to defense cutbacks are more approximate, but still useful. A major risk factor is the degree of defense dependence. Communities like Lima, OH, whose economic livelihood is tied to production of Army tanks, are in some jeopardy.[16] The U.S. shipbuilding industry, which now sells virtually all of its output to the DoD, is maximally exposed.

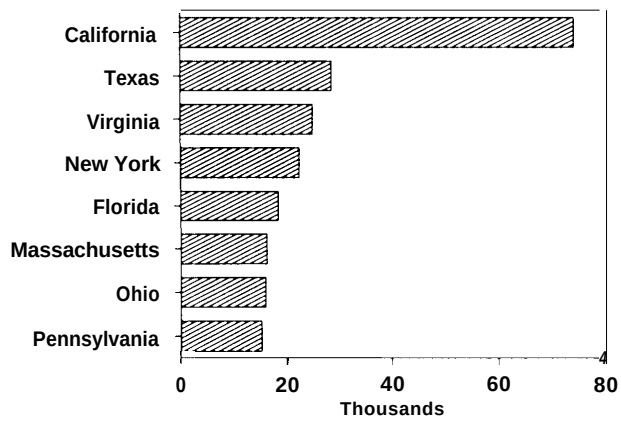
The severity of impacts also depends on what else is happening in the local economy. Size and diversity help, but even a large, diverse economic community can be substantially hurt by defense cutbacks if it is already suffering from weakness in other sectors. For example, the unemployment rate in Los Angeles-Long Beach was 8.5 percent in June 1991, well above the national average of 6.9 percent; the rate had risen from 4.6 percent a year earlier, reflecting a combination of layoffs in finance, banking, construction, and aerospace, the last largely defense.

States and Localities

U.S. defense activities and employment are quite heavily concentrated in certain regions, States, and localities. In 1991, over half of all defense spending was in eight States (figure 1-5).[17] Defense spending amounted to more than 5.8 percent of total purchases in 10 States (figure 1-6). The national average was 4.1 percent; 32 States fell below that level.[18]

In some States military bases account for most defense-related spending while in others defense spending flows primarily to industries that produce goods and services for military use. Insofar as defense spending is reduced through troop cuts, States and communities where military bases are closed are hit hardest, whereas cancellation of big, expensive weapons systems is felt more in the places that rely on those defense industries.

Figure 1-5-Eight States Totaling One-Half of U.S. Defense Spending, 1991



SOURCE: Department of Defense, *Projected Defense Purchases Detail by Industry and State, 1991 to 1997* (Washington, DC: November 1991).

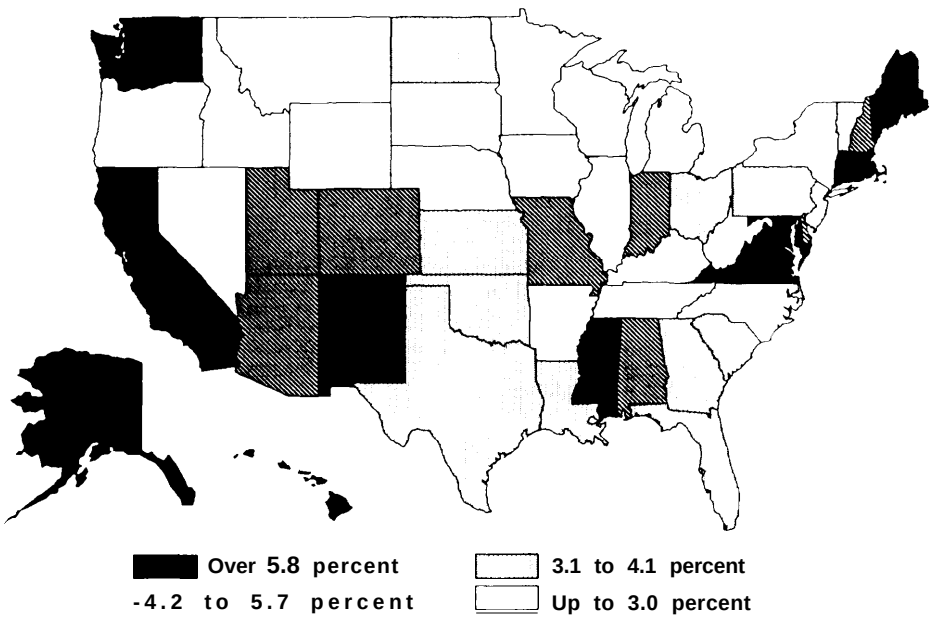
Virginia's high rank in dependence on defense spending is due largely to the huge military establishment at the Pentagon and its dependent consulting fins, and to military bases throughout the State; but the building of Navy ships at Tenneco's big Newport News yard and defense production of telecommunication equipment contribute a large share as well. Mississippi's defense dependence rests almost entirely, and nearly equally, on military bases and the Ingalls shipyard at Pascagoula. The active duty military dominates defense spending in Alaska and Hawaii. The picture is more mixed in the State of Washington, which has important production of ordnance and aircraft as well as a big Navy yard and military bases, and in Maryland, which has a telecommunications industry as well as high DoD employment. Connecticut and Massachusetts, on the other hand, owe most of their defense spending to industry-aircraft engines and submarines in Connecticut, telecommunications in Massachusetts. California, which has far and away the highest defense spending of any State in dollar amounts, has some of everything: military bases; industrial production of ordnance, electronic and communication equipment,

[16] Ch. 6 discusses the effects on different kinds of communities of the defense build-down, and economic development programs to cope with the effects.

[17] "Defense spending" includes purchases of defense-related goods and services, both direct purchases (from prime contractors) and indirect purchases (from subcontractors and suppliers); military pay; and the salaries of DoD civilian employees, "State purchases" differ from State gross product, since they include purchases of intermediate goods and services by producers of end products. State gross product and gross national product figures count only the value of final products, eliminating the double counting involved in adding up intermediate purchases. Data on State defense spending is developed by DoD, using the Defense Employment Impact Modeling System (DEIMS) based on input-output tables for the U.S. economy.

[18] The figure for DOD spending as a share of all U.S. purchases (4.1 percent in 1991) is not comparable with the figure of defense outlays as a share of U.S. Gross National Product (5.5 percent) because of differences in definitions.

Figure 1-5-Defense Spending as a Percent of State Purchases, 1991



SOURCE: Department of Defense, *Projected* Defense *Purchases Detail by State and Industry, 1991 to* 1997 (Washington, DC: November 1991).

and aircraft; and a plethora of defense-related business services.[19]

About one-half of defense-related jobs within the United States are in eight States. Again, California is far in the lead (figure 1-7). In 1991, 5 million people within the United States had jobs linked to U.S. defense spending, including employees of prime contractors to DoD and the primes' subcontractors and suppliers, men and women in active duty military service, and civilian DoD employees. This amounted to 4.2 percent of U.S. employment. (This figure is used for purposes of analyzing defense-related employment State by State. However, the hundreds of thousands of defense-related jobs, mostly military, outside the United States should be taken into account when the whole Nation's dependency on defense jobs is considered. In 1991, 5.1 percent of all U.S. jobs were defense-related.)

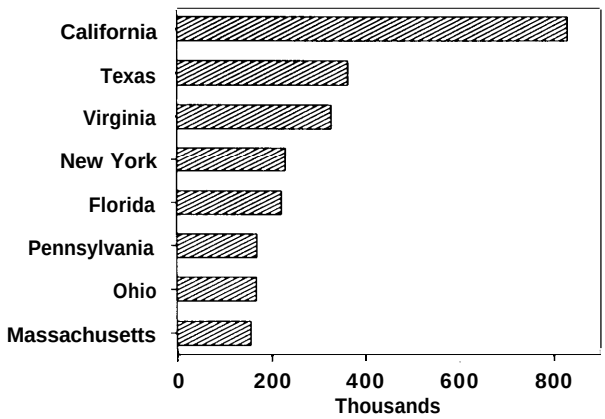
Defense dependency in employment—the percentage of all jobs within a geographic area that are defense-related—is likewise concentrated. Three States, Alaska, Hawaii, and Virginia, plus the District of Columbia, were far above the average in defense-dependent employment (figure 1-8); most of these defense jobs were in active duty military service and DoD civilian employment, although Virginia also had a much higher than average share of defense industry jobs. In eight States defense-related jobs were 5.8 percent or more of total employment. Twenty-seven States fell below the national average of 4.2 percent.

As in the Nation as a whole, defense dependence has steadily declined even in States that are most involved with defense industries and military bases. In California, the top-ranking State in amount of defense spending and numbers of jobs, defense spending dropped from 15.6 percent of gross State product in 1964 to 7.8 percent in 1990. Although California's defense spending in constant dollars was much greater in the 1980s than at the height of the Vietnam War, the still greater rise in the State's gross product lessened defense dependency (figure 1-9).

Statewide averages of defense dependence can obscure local vulnerabilities. For example, 2.2

[19]Department of Defense, Directorate for Information *operations* and Reports, *Projected Defense Purchases Detail by Industry and State: Calendar Years 1991 through 1997 (Washington DC:* November 1989).

Figure 1-7—Eight States Totaling One-Half of U.S. Defense-Related Employment, 1991



SOURCE: Department of Defense, *Projected* Defense Purchases, *Detail by State and Industry, 1991 to* 7997(Washington, DC: November 1991); Department of Defense, Office of the Comptroller, *National Defense Budget Estimate for FY 1992* (Washington, DC: 1991); Department of Defense, Washington Headquarters Services, *SelectedManpower Statistics, FY 1990* (Washington, DC: 1991).

percent of jobs in Maine were in private defense industries in 1991—below the national average of 2.5 percent for defense industry employment. Yet Maine's largest employer is Bath Iron Works, located in a little coastal town with a population of no more than 11,000, but employing 11,700 workers drawn from a 30-mile strip on the State's southern coast. Bath Iron Works gets 85 percent of its business from ships it builds for the Navy. Its managers would like to diversify into merchant ships, but that business is in total collapse in the United States: one U.S. merchant ship is currently in production, compared with about 400 in Japan, Korea, and Europe. In 1990, the president of Bath Iron Works expected the defense backlog to keep the company going for another 2 or 3 years; but without major new business, a reduction of at least 3,000 jobs could be expected over that time.[20]

Of course, some defense-dependent communities will continue to do well, if the military programs they rely on survive. Connecticut, for example, ranks near the top among all the States in dependence on defense spending, but its unemployment rate was slightly below average in the 1991 recession year, and future prospects looked good-at least for the western part of the State. The Pratt and Whitney aircraft engine company, located in Hartford, won the hotly contested decision to make the jet engine for DoD's one big new military aircraft program, the F-22, or Advanced Tactical Fighter; the company and its local subcontractors are also doing well in the commercial aircraft business. At the same time, the aforementioned Norwich-New London-Groton area of southeast Connecticut, whose livelihood is submarines, is in trouble. Here, United Nuclear Corp., which made nuclear engines for submarines, is already closing, and General Dynamics' big Electric Boat outfit, assembler of submarines, has lost business, is laying off workers, and has announced that it will close down altogether if it does not win all the Navy's dwindling contracts (down to one a year) for the Seawolf attack submarine.[21]

Though it is not possible to pinpoint which or even how many communities are at serious risk in the defense build-down, data on DoD prime contract awards by county provide some rough approximations. In 1989,93 of the Nation's 3,137 counties got awards worth over three times the national average, per employed person. Those counties encompassed 8.5 million workers, or 7 percent of the employed labor force. Another way to measure vulnerability is to combine concentration of prime contract awards with the county's unemployment rate, compared to the national rate at the time. Using these measures, 138 are most at risk with either high unemployment (over 6 percent; the national rate was then 5.4 percent) and moderate to high defense dependency (greater than the national average), or moderate unemployment (4.5 to 6 percent) and high defense dependency. These counties were home to 4.9 million workers, or 4 percent of employed people.

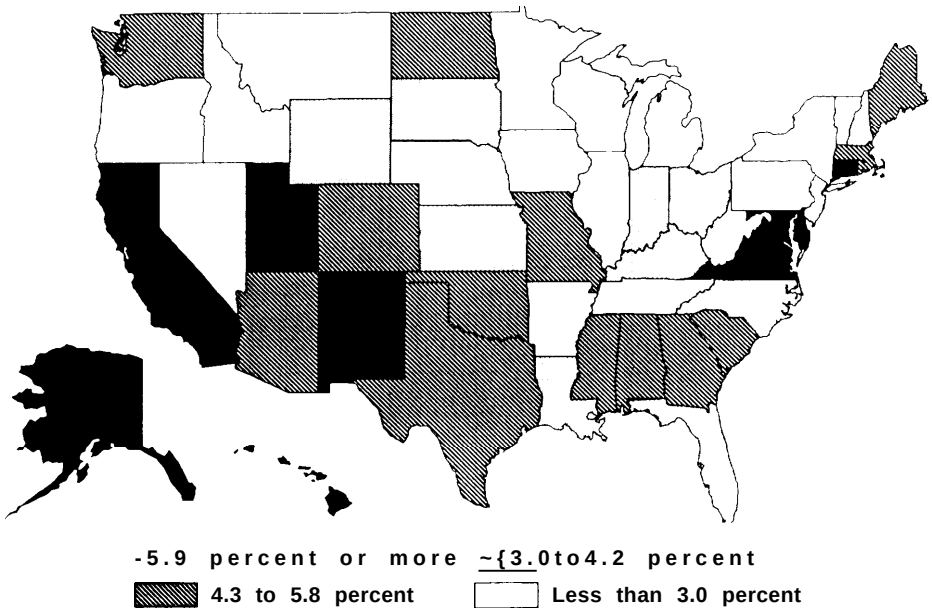
Industries

The big buildup in defense spending in the early 1980s mostly went to development and purchase of hardware, not to higher troop strength. Defense industry business, especially in aircraft and electronics, expanded enormously. As shown in figure 1-10, aircraft and communications equipment were the

[20] William E. Haggett, Chairman, Bath Iron Works, testimony before the Subcommittee on Defense Industry and Technology, Committee on Armed Services, U.S. Senate, May 4, 1990; and personal communication, cited in Linda Kravitz, "Wages of Peace: Community and Industry Experience with Military cutbacks," contractor report prepared for the Office of Technology Assessment, July 1990.

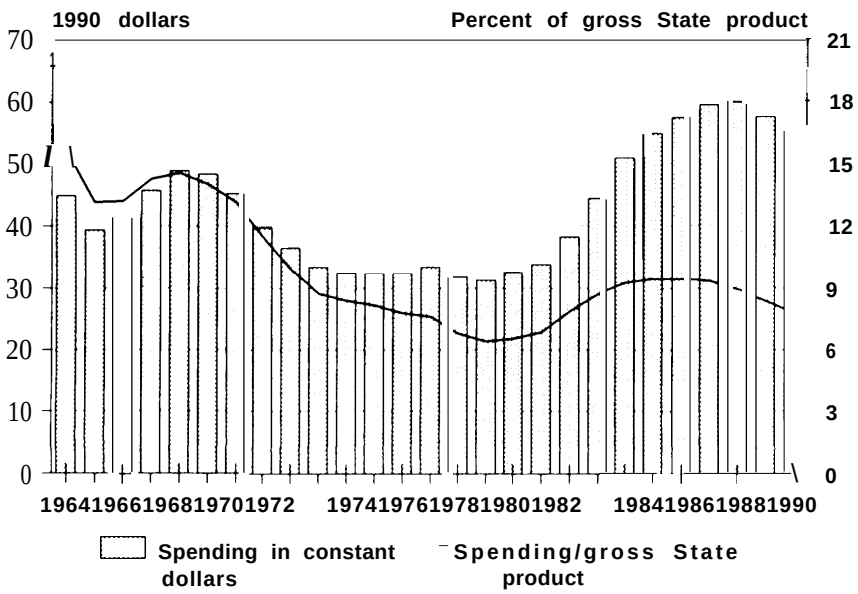
[21] Robert Holzer, "Navy's Seawolf Sub Award Threatens Future of Losing Shipyard," *Defense* News, Mar. 25, 1991.

Figure 1-8-Percent of State Employment in Defense, 1991



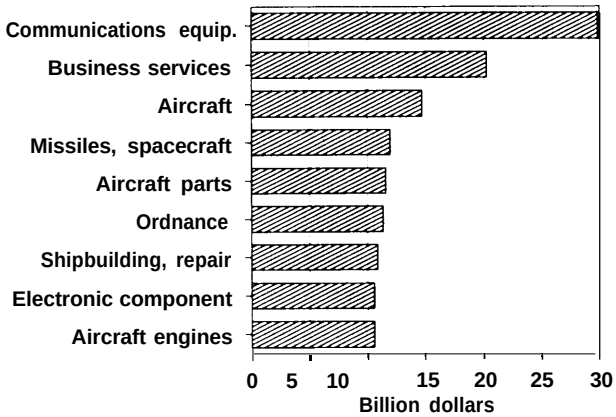
SOURCES: Department of Defense, *Projected Defense Purchasesm, Detail by State and Industry, 1991 to 1997* (Washington, DC: November 1991); Department of Defense, Office of the Comptroller, *National Defense Budget Estimate for FY 1992* (Washington, DC: 1991); Department of Defense, Washington Headquarters Services, *Selected Manpower Statistics, FY 1990,* (Washington, DC: Department of Defense, 1991); Department of Labor, Bureau of Labor Statistics, *Employment and Earnings,* October 1991).

Figure 1-9-Direct Defense Spending in California, 1964-90



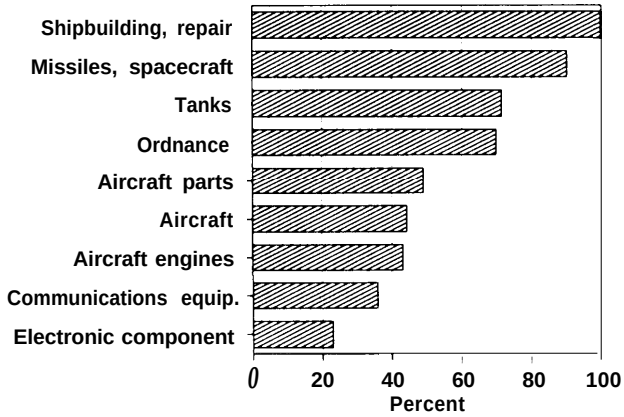
SOURCE: California commission on State Finance, *Defense Spending in the 1990s: Impact on California* (Sacramento, CA: California Commission on State Finance, summer 1990).

Figure 1-10-ToP 10 Defense Industries by Value of Defense Output, 1990



SOURCE: Department of Commerce, Office of Business Analysis, unpublished data.

Figure 1-11—ToP 15 Defense Industries by Defense Share of Industry Output, 1988



SOURCE: Department of Commerce, Bureau of Economic Analysis, unpublished data.

largest defense industries in 1990, and both were highly dependent on defense dollars. Though they did not approach the near-100 percent defense dependency of shipbuilding, they did sell between 40 to 60 percent of their output to military purchasers (figure 1-1 1).

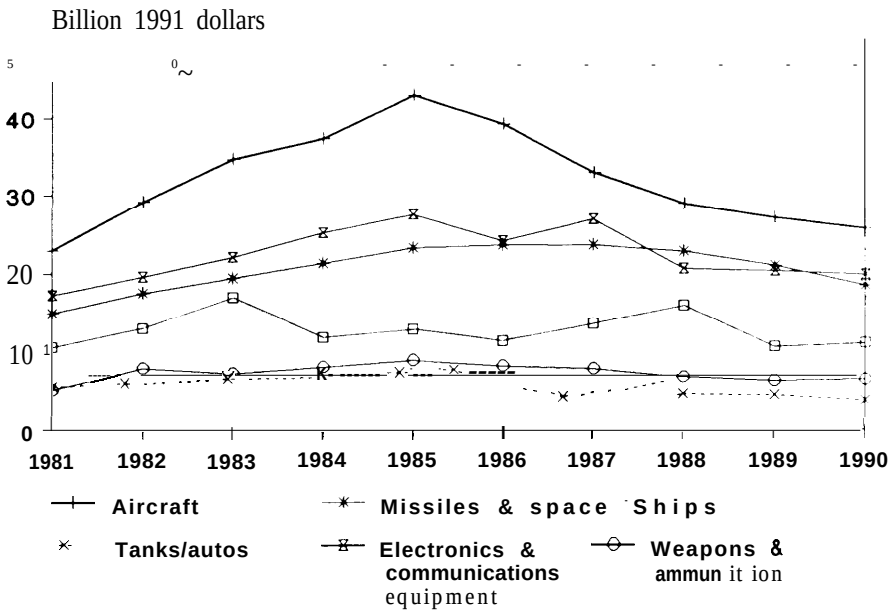
Of the major military systems-aircraft, missiles, ships, tanks and other land vehicles, ammunition—aircraft got the lion's share of procurement dollars in the defense buildup (figure 1-12).[22] Similarly, as defense budgets have declined, aircraft has also taken the biggest hit, although it is still the leader among the major military systems. Effects of defense reductions were clearly visible in the aircraft industry by 1990, and there was every expectation of still deeper cuts in coming years. Three of the four tactical aircraft programs of the 1970s and 1980s are slated to end soon, with only the Navy's F/A-18 lasting past 1993. Also, in January 1991, Secretary of Defense Richard B. Cheney canceled the Navy's A-12 attack aircraft program because of excessive cost overruns, resulting in immediate layoffs of 5,000 people from the McDonnell Aircraft Co. in St. Louis and another 2,000 from General Dynamics in Fort Worth. Although impacts of defense cutbacks might be relatively greater in industries that are more exclusively military, such as ordnance or tanks, the aircraft industry is the big one, and the size of the cuts will be greatest there.

The aircraft industry as a whole was not in a tailspin in 1991. While defense orders were being slashed and the military airframe companies faced trouble, the commercial aircraft market was holding up. Even the Gulf War and the recession did not greatly dampen the demand of many airlines for new equipment, and the commercial companies' huge backlog of orders stayed relatively intact. Nevertheless, employment in the aircraft and aircraft parts industry was down by 64,000 (from 708,000 to 644,000) from July 1990 to July 1991, and another 20,000 jobs disappeared in missiles and space equipment. McDonnell Douglas, for example, abolished over 17,000 jobs in 1990, many in the commercial business in Long Beach, CA, but about 4,000 on the military side in St. Louis; another 5,000 went with the A-12 decision. Long Island has been losing aircraft industry jobs since 1987 when the Fairchild-Republic plant closed up shop, with the loss of 3,300 jobs, after DoD canceled the T-46 Navy jet trainer. Grumman, the biggest defense employer on the Island, reduced its work force from 34,000 to 25,000 in the following 3 years, and in 1991 announced additional cuts of 1,900. Other leading military contractors on Long Island, such as Eaton AIL and Hazeltine, abolished many more jobs.[23]

[22]Much of research, development, and testing was also concentrated in aircraft, although in that category spending is not separately reported by major military systems.

[23]The figures given here are illustrative. No satisfactory totals exist of layoffs in defense industries in 1990-91.

Figure I-12—Prime Contracts for Hard **Goods**



SOURCE: Department of Defense., Washington Headquarters Services, *Prime* Contracts Awards, *FY 1990,* P03 (Washington, DC: Departmentof Defense, 1991).

In many cases, the prospect of fewer and smaller defense contracts is driving layoffs in the aircraft industry, as much as the cancellation or early cutoff of current programs. For example, the 1990 layoffs at McDonnell Douglas in St. Louis (before the A-12 decision) reflected the fact that no new defense programs could be seen coming down the pike. Many of the 4,000 jobs abolished were in engineering, computer programming, clerical work, and management—relatively few in production work, since actual output had not yet declined. Aside from Boeing, the industry giant, and McDonnell Douglas,[24] the other time companies have very little commercial business except for some subcontract work. Some of these military airframes face "dire prospects, " according to financia.l analysts. Too many defense companies are chasing too few programs, these analysts say, and the "moderate" work force reductions that have taken place so far are only the beginning.[25]

As defense spending winds down, public concerns about effects on the civilian side of the economy center on two issues: jobs and technology. Reductions in defense spending will always involve job losses, with some disruption and hardship even if other economic activities eventually replace the jobs. Concentrated job losses in a local labor market can force many of the job losers into long spells of unemployment or acceptance of ill-paid dead-end jobs. If the losses are great enough, the whole community can suffer. Obviously, defense spending should not be either a jobs program or an economic development program, but there is a justified public concern about the aftermath of government decisions that deprive people of their livelihood. The concern is not only for hardships to individual job losers, but also for the costs to society as a whole--directly in payment of unemployment benefits and loss of tax receipts, and indirectly in the waste of human abilities.

Another concern is the possible dissipation of valuable technological resources in the transition to an economy less devoted to defense. Mainly, this means people. The thousands of engineers and

[24]The future of McDonnell Douglas as a commercial aircraft manufacturer is in some doubt. In November 1991 the company announced its intention to forma partnership with Taiwanese interests (including the government of Taiwan) to gain enough financial backing for production of the MD-12, which is planned as a competitor to Boeing's 747.

[25]Anthony Velocci, Jr., ' 'Third-Quarter Results Mask Defense Industry Weakness, " *Aviation Week and Space Technology, Nov. 12,* 1990, pp. 20-22.

computer specialists being laid off by the military aircraft industry are technological assets. So are the managers and productions workers-in small defense companies as well as large ones-with years of experience in meeting technically demanding requirements in military contracts. When teams of people break up, labs close down, and divisions or whole companies disappear, the technological know-how those teams and institutions possess can disappear with them.

DISPLACED DEFENSE WORKERS

The Dimensions of Displacement

In 1991, national defense employed about 6 million people in the private defense industry, DoD civilian ranks, and the active duty military services. Based on projections of defense spending in the President's 1992 budget, as many as 1.1 million of those positions could disappear by 1995. If defense spending is cut deeper and faster (to $169 billion, or 41 percent, by 2001), the defense jobs lost in the 4 years 1991-95 could add up to as much as 1.4 million, and in the 10 years ending in 2001, to 2.5 million (table l-l).

Nearly 4 million of the defense-related jobs in 1991 were civilian jobs, about 1 million in DoD and 2.9 million in the industries that produce goods and services for DoD. From 1991 to 1995, as many as 1 million of those positions could vanish as defense spending dwindles, and by 2001, 1.7 million.

These figures may overstate the number of jobs that will actually be lost. As noted, it is likely that at least half of the loss of civilian jobs in DoD can be taken care of by attrition without the need for layoffs. Many private defense jobs are in industries that provide goods and services not specifically and uniquely military. Assuming healthy economic growth, some defense jobs in those industries will never disappear at all, because commercial customers will take the place of defense procurement. This could be the case, for example, in such diverse sectors as banking, textile manufacture, and steelmaking. Defense companies that also make commercial products-especially in aircraft and electronics-might expand that side of the business and move some employees over from the military side. In addition, normal attrition-people moving to new jobs, retiring, or otherwise voluntarily leaving the work force-could moderate the impact of some of the job loss. On the other hand, these numbers do not count jobs generated by the pay of defense workers--anything from grocery store clerk to school psychologist. In communities hit hard by defense cutbacks such jobs could disappear without much hope of early replacement.

Prospects for Displaced Defense Workers

In some ways, displaced defense workers are better off than displaced workers generally. Defense industries have higher concentrations of professionals and skilled workers than the overall economy; engineers, scientists, and technicians represent more than 10 percent of the work force in defense industries, but only 4 percent of the U.S. work force, and precision production workers are nearly 7 percent of defense industry workers, but 3 percent of workers in general. Such highly skilled people are usually in demand in the labor market.

On the other hand, 57 percent of defense employment is manufacturing, compared with only 17 percent in the economy at large. Manufacturing workers, especially semiskilled blue-collar workers, have a harder time than other displaced workers in finding new jobs. The continuing decline in manufacturing employment generally does not bode well for the less skilled manufacturing worker displaced from the defense sector. Also, lower and midlevel managers may be caught in the squeeze of streamlining production and the automation of many of their tasks.

A positive factor is that public and private efforts to help displaced workers find or retrain for new jobs are better developed than in the past. First, the Worker Adjustment and Retraining Notification Act (WARN) that took effect in 1989 means that many displaced defense workers will get at least 60 days' notice of layoff (though some will not, because of exceptions and loopholes in the law). Lead time of at least 60 days is crucial in providing effective adjustment services. Second, public adjustment services are more experienced and better funded than in times past, and most large defense companies now provide some services for their displaced workers.

These positive factors must also be qualified. The major assistance program for displaced workers is the federally supported Economic Dislocation and Worker Adjustment Assistance (EDWAA) program

Table I-l—Projected Defense Spending and Employment Levels

Year	Total defense outlays (051) (billions)	Active duty military (thousands)	DoD civilians (thousands)	Defense industry employment (thousands)	Defense employment (thousands)
1991 DoD estimate	**$287.5**	**2,049**	**1,044**	**2,900**	**5,993**
1995 DoD estimate	**$235.7**	**1,653**	**940**	**2,280 to 2,370**	**4,873 to 4,963**
Loss from 1991	**$51.8**	**396**	**104**	**530 to 620**	**1,030 to 1,120**
Percent loss	**18%**	**19"!0**	**10%**	**18 to 21 %**	**17 to 19"/0**
1995 **faster paced reduction**	**$218.0**	**1,653**	**940**	**1,980 to 2,080**	**4,573 to 4,673**
Loss from 1991	**$69.5**	**396**	**104**	**820 to 920**	**1,320 to 1,420**
Percent loss	**24%**	**19%**	**1 o%**	**28 to** 32%	**22** to 24%
2001 faster paced reduction	**$168.6**	**1,340**	**697**	**1,500 to 1,620**	**3,537 to 3,657**
Loss from 1991	**$118.9**	**709**	**347**	**1,280 to 1,400**	**2,336 to 2,456**
Percent loss	**41 "/0**	**350/0**	**33%**	**44 to 48%**	**39 to 4170**
Loss from 1995,	**$49.4**	**313**	**243**	**360 to 580**	**916 to 1,136**
Percent loss	**23%**	**19Y0**	**26%**	**18 to 28%**	**20 to 24%**

NOTES: All dollars are constant 1991 dollars. Total employment in this table includes DoD civilian and military personnel stationed overseas.

SOURCES: DoD estimates from the Office of the Assistant Secretary of Defense (Public Affairs), "FY 1992-93 Department of Defense Budget Request," News Release No. 52-91, Feb. 4, 1991; except defense industry employment, which is estimated by OTA based on DoD projection of defense purchases. Faster pace alternative budget estimates from William Kauffman, *Glasnost, Perestroika and U.S. Defense Spending* (Washington, DC: Brookings Institution, 1990; and William Kauffman and John Steinbruner, *Decisions for Defense* (Washington, DC: Brookings Institution, 1991). The 2001 alternative uses projections of troop and civilian personnel levels given by Kauffman in *Glasnost, Perestroika and U.S. Defense Spending* (Kauffman's scenario D). Industry employment levels estimated by OTA from budget estimates given by Kauffman. The 1995 budget estimates are from Kauffman and Steinbruner, *Decisions for Defense,* and reflect savings through reductions in procurement of new systems and a reduction in nuclear forces, assuming no additional reduction in the estimates of manpower given by DoD. Industry employment for 1995 was estimated by OTA based on level of defense purchases.

(originally created by Congress in 1982 as Title III of the Job Training Partnership Act (JTPA) and amended and renamed EDWAA in 1988). EDWAA programs are operated at the State and local levels, and they are uneven in quality. The best have benefited from nearly a decade of experience and are doing an excellent job, but the majority fall below that level—some far below. As discussed below, some problems in the design and administration of EDWAA hinder even the top programs from doing their best. As for large private firms, most are more generous with services for salaried workers (managers, professionals, and other white-collar workers) than for their blue-collar production workers; however, a few make no such distinctions, providing top quality services for all,

An important negative influence in 1991 was the recession and weak recovery, which made job prospects for many displaced workers bleak and put adjustment programs under strain. EDWAA funding has recently been higher than ever before, at $527 million in fiscal year 1991 and $577 million in 1992. Even so, by fall 1991 many States were in danger of running short of money in the 1991-92 program year because the recession had greatly increased demand for services. Congress has supplemented the regular EDWAA appropriation with an extra $150 million in DoD funds earmarked for services to displaced defense workers from 1991 to 1993, but there are problems in getting this money quickly to where it is needed.

The recession hit especially hard in some defense-dependent areas. In Los Angeles-Long Beach, the unemployment rate was 9.3 percent in September 1991, and in the mid-Massachusetts industrial belt, 10 to 12 percent, compared to a national unemployment rate of 6.6 percent. Worker adjustment programs that work quite well in good times are of less use when job openings scarcely exist. The fact that only about 30 percent of unemployed workers were receiving unemployment insurance benefits in 1990, compared to 50 percent in previous recessions, added to the negative outlook for workers displaced from defense jobs.

Adjustment Assistance for Displaced Defense Workers

Many studies and years of experience have shown that well-run adjustment assistance projects are a genuine help to displaced workers. On average, workers who take part in adjustment projects find jobs sooner, stay employed more steadily, and earn

more than they would without such help.[26] The elements that make for success in a displaced worker program are also well established. Key factors are:

- . early action-offering adjustment services before layoffs begin if possible,
- . cooperative efforts by management, worker representatives, and public service agencies,
- . a full range of services, and
- . training that is carefully matched to workers' background and abilities.[27]

Projects supported by EDWAA can offer an array of services, including counseling, skills assessment, job search skill training, job development, relocation assistance, and retraining (including training in basic skills of reading and math when needed). As noted, FY91 and FY92 appropriations for EDWAA were relatively generous, and were supplemented by funds to be transferred from DoD.[28]

In its first few years, the Title III program was moderately successful in getting jobs for participants, achieving placement rates of 65 to 70 percent, but it was reaching only about 5 to 7 percent of eligible workers. Related problems were that many States did not have active programs, were failing to spend their allocated funds, and were carrying over large and increasing unspent funds every year. Few States were getting services to workers quickly after layoff-or still better, before layoff-which was one reason the program reached so few workers; participation rates are much higher and outcomes better if services are available early .29 Further, many projects were giving scant attention to training.

The 1988 EDWAA amendments were designed to put more emphasis on rapid response, give more attention to training, and set up incentives for spending appropriated funds to serve the needs of more displaced workers. Two years after the amendments took effect, one visible positive change is that the proportion of eligible workers served had risen to about 9 percent. Participation will never be, and should not be, 100 percent; many displaced workers are well able to find new jobs on their own. Judging by experience in Canada (which has long had a small but effective rapid response program run by the government),[30] an overall participation rate between two and three times the current one-say 20 to 25 percent-might be expected as the program improves.[31]

The biggest continuing shortcoming in the EDWAA program is that rapid response is far from universal and often nonexistent. The responsibility for rapid response lies mainly with States, some of which (e.g., Colorado, Massachusetts) are doing an excellent job. But for every State where rapid response is working, there are probably two more where it is not. One recent study for the U.S. Department of Labor (DOL) found that of 15 States examined, five had rapid response procedures that were well established and working well, six had problems, and four had a "low commitment" to rapid response.[32]

The way EDWAA funds are divided up, both among the States and within the States, puts further obstacles in the way of quick response. The money is distributed in advance, and may not be where the displaced workers turn out to be. By law, 80 percent of EDWAA funds are allocated to the States; the

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[26]For a summary of studies evaluating such projects, see U.S. Congress, Office of Technology Assessment, *Technology and Structural Unemployment: Reemploying Displaced Adults, OTA-IT'E250* (Springfield, VA: National Technical Information Service, February 1986), ch. 6, especially pp. 231-233.

[27]Ibid., especially pp. 233-42.

[28]The full amount may not be made available *to* displaced defense workers. In 1990, Congress appropriated $200 million in DoD funds to assist workers and communities affected by the defense build-down, $150 million for workers and $50 million for communities, in fiscal years 1991-93. The defense authorization and appropriations acts passed by Congress in November 1991 provided that up to $30 million of the $200 million could be transferred to the Small Business Administration for loans to small businesses that suffered ''sevexe economic injury' as a result of the emergency deployment of troops to the Persian Gulf after July 31, 1990. Three-quarters of the $30 million would come from the fund for workers, the other one-quarter from the fund for communities. The full $30 million may not be granted; the seriously injured small businesses may turn out to be rather few.

[29]Ibid; also, U.S. Congress, Office of Technology Assessment, *Plant Closing: Advance Notice andRapidResponse,* OTA-ITE-321 (Springfield, VA: National Technical Information Service, September 1986), pp. 13-18.

[30]For discussion of Canada's Industrial Adjustment Service, see U.S. Congress, Office of Technology Assessment *Technology and Structural Unemployment: Reemploying Displaced Adults,* OTA-ITE-250 (Springfield, VA: National Technical Information Service, February 1986).

[31]Participation is Often much higher—up t. 70 or 80 percent—in mass layoffs and plant closings when projects provide a good range of services early, *at* least by the time of the layoff. Ibid.

[32]SRI International, *Study of th, Implementation of the Economic Dislocation and Worker Adjustment Assistance Act,* report prepared for the U.S. Department of Labor, Employment and Training Administration (Washington, DC: October 1990), p. VI-19.

allocation occurs at the beginning of the fiscal year, 9 months before the program year begins. (The reason is to give States and localities time to plan for their next year's programs.) At least half of the State allotment must be further allocated in advance to substate areas. The law takes some account of the unpredictability of displacement, allowing States to reserve 10 percent of their allocation to be spent as the need arises in substate areas, and keeping 20 percent of the whole EDWAA appropriation in a national reserve fund, to be dispensed to States and localities as needed by the Secretary of Labor. However, the emergency reserve system does not work well; delays at both the Federal and State levels mean that the money is often not available until weeks or months after the layoffs for which they are intended.

Staff at DOL have tried to hasten the process, but there are still bureaucratic roadblocks that could be removed, especially requirements for exacting detail in proposals for grants from the fund. Also, virtually every State EDWAAfficial interviewed by OTA said that delays in services are aggravated by the DOL rule that prevents State and local agencies from paying for services up front with their own money and then getting reimbursed for their share if and when the national reserve fund comes through. If they respond to the present need with their own funds, they risk not being able to respond to layoffs later in the year.

The 1990-91 recession highlighted the problems of getting the Federal discretionary funds to where they are needed. It was already evident in October 1991, barely into the second quarter of EDWAA's 1991 program year,[33] that demands for services were so exceptionally high that several States could run out of funds before the year was over. Some State managers were practicing a form of triage, giving only minimal services to workers they thought had the best chance of finding jobs on their own. Yet at the same time, requests for grants from the $105 million in the national reserve fund were running behind the rate that would exhaust the fund by the end of the year. A major reason, according to one DOL official, is that many State EDWAA managers simply can' t handle the complexities of applying for the grants; the few that can are too swamped with work to write more than a limited number of proposals. The same reasons may explain why requests for grants from the $150-million fund earmarked for displaced defense workers have been few so far.

Some problems are apparent in the quality and mix of services, especially when provided by organizations whose primary purpose and experience is in employment and training services for low-income and disadvantaged people, not displaced workers. The 1988 amendments required States to establish substate areas with at least 200,000 population and allocate 60 percent of the States' EDWAA funds to them. Within the substate areas, the grantee responsible for providing services is often the Service Delivery Area agency (SDA), which also provides services in the much bigger JTPA program for low-income people. The law does not require that States designate SDAs as the local agencies to serve displaced workers, but more often than not they do--partly because many of the SDAs have powerful political patrons. Some SDAs do a good job serving displaced workers, but many do not, because their outlook is shaped by their experience with low-income people.

Problems sometimes arise from the law's requirement that half of EDWAA funds be spent on training, not for other adjustment services. (In particular projects, State Governors may reduce the requirement to 30 percent). The requirement can have perverse effects, leading service providers to choose expensive training or ignore other programs that might provide training funds. And it can reduce flexibility in projects trying to serve a large number of displaced professionals, whose needs may not include training. Another problem is that DOL policy generally rules out EDWAA training for displaced workers who are already skilled but want to refresh or upgrade their skills in the same occupation. This limitation is at cross purposes with the goal of providing a more adept and highly skilled work force to U.S. industry and thereby improving competitiveness.

Finally, DOL's information sharing and technical assistance to States and localities is scanty, reflecting in part a small budget and bare bones staff at headquarters. This is one reason for the big gap

[33] The EDWAA program year runs from July 1 to the following June 30, and is funded by appropriations made 9 months before for the fiscal year ending September 30, or the end of the first quarter of the EDWAA program year. Thus, the $527 million appropriation for fiscal year 1991 (October 1, 1990 to September 30, 1991) was to be spent in the program year July 1, 1991 to June 30, 1992.

between best practice in a few States and typical practice.

DoD civilian employees are in a less exposed position than defense industry workers. First, it is not likely that many will be laid off or RIFed (reduced in force), because a DoD hiring freeze and attrition will take care of much of the downsizing. However, individuals in some positions and some locations will still face displacement. For example, all eight Navy shipyards are scheduled for RIFs in 1991, and further cuts are expected in future years. Furthermore, DoD estimates of civilian positions to be eliminated do not include those that will disappear in the second round of military base closings. Most of these closings and associated job losses will not occur until 1995 and thereafter.

DoD civilian workers who are laid off are eligible for EDWAA, but the department has also set up several other programs to help its displaced workers. The cornerstone program is the Priority Placement Program (PPP). Under the program, RIFed employees must be hired to fill DoD openings for which they are qualified. DoD employees receiving RIFs are automatically signed up for PPP, but may specify locations where they are willing to work and are not expected to take more than minor reductions in pay or status.[34] Once they are offered a job under PPP, they must decide within 24 hours whether to accept it; refusal is usually grounds for revocation of DoD's generous severance pay (though exceptions can be made). While PPP has worked well in the past, there is some question whether it can take care of the large number of people threatened with RIFs in the defense build-down. However, the rate of natural attrition from DoD, plus the fact that PPP registrants can be hired under the hiring freeze, make it likely that PPP will continue to place a moderate proportion of registrants (say one-quarter, compared to more than one-third in the past). DoD also makes many of its military transition programs available to civilian workers; among them is the Transition Assistance Program, a 3-day workshop that provides skills assessment, job search skills training, and other outplacement services. However, the quality of this program varies from one DoD facility to another, and links to the EDWAA program, which provides more complete, longer term services, are not well established.

Most large private companies provide some reemployment assistance. However, the quality and extent of services varies greatly among fins, from outstanding to virtually nonexistent. For example, both Texas Instruments and General Electric provide not only outplacement services but also training money for displaced workers. At the other extreme, at least one large defense company provided almost no services itself, and refused to allow local EDWAA providers into the plant to acquaint workers with what was publicly available. Some companies give more advance warning than the 60 days required by law, but others have scheduled layoffs in ways that escape WARN requirements.

Although company-provided services for salaried workers are often superior to those for blue-collar workers, some companies (e.g., GE Aerospace in Burlington and Pittsfield, MA) offer high quality services to all displaced employees in one physical location.[35] Many of the best company programs are developed and operated by labor-management committees, or at least with the cooperation of labor. Company participation at the early stages of a layoff can be especially valuable, because company managers are the frost to know of layoff plans and can promptly provide space and staff to kick off provision of services early.

The displaced defense workers likely to be hardest to reach are those who are laid off from small firms that lack the resources to provide assistance, and who don't get WARN notices because the layoff is too small to trigger the requirements or even to get much public attention. The other group of defense workers likely to fare badly are those living in defense-dependent communities where prospects for alternative sources of economic growth are poor. For some displaced workers in such communities, the best recourse is to move, as professionals and managers often do. For example, when 4,900 workers were laid off between 1986 and 1991 in Pittsfield, MA (population of about 50,000), virtually all professionals and top managers moved away. Very few of the blue-collar workers moved. Many had roots in the community going back several generations; moreover, relocation is a high risk choice for workers without the distinctive resumes that managers and professionals usually have. Also, for families that depend on income from two wage

[34]Employees also receive counseling so that they understand their choices under PPP.

[35]The Burlington project is partially funded by EDWAA.

earners, moving is risky for the working spouse who has not been laid off. A valuable service displaced worker projects can perform is to collect information about work opportunities in other areas for blue--collar workers or lower level managers, to help them in a realistic evaluation of their options.[36]

ENGINEERS: A SPECIAL CASE

Engineers form a higher proportion of the defense work force than of U.S. industry at large. With the scaling down of the defense industry, many of these highly qualified employees will be let go. As many as 127,000 of the estimated 342,000 defense engineering positions in 1990 may evaporate by 1995.[37] As a group, these engineers embody the kind of technical know-how that the United States needs to improve commercial competitiveness. It is in the national interest to integrate these workers into the civilian sector as quickly and fully as possible.

In the long term, for the Nation as a whole, displacement of engineers is not likely to present major problems. In 1970-73, the civilian aerospace industry declined at the same time the Vietnam War was winding down, and the combination triggered an intense bout of unemployment among defense industry engineers. Today, the civilian aircraft industry, a major alternative employer, has plenty of orders. At the same time, the supply of engineers is falling. The number of new graduates has been decreasing and is likely to continue doing so, as the college age population falls and fewer students choose engineering. Experienced engineers displaced from defense industry jobs might be able to fill the gap left by a smaller supply of young engineers entering the work force.

Despite the generally positive long-term outlook, engineers losing their jobs in the current cutbacks will need help in finding new employment. During the defense buildup of the 1980s, if there were layoffs at one defense company another one was hiring. Most laid-off defense engineers simply moved on to the next contractor. In layoffs since 1989, many engineers have also moved to other defense fins. However, this source of jobs is drying up in some previously rich areas, such as southern California. And those who took new jobs in defense may find themselves laid off again as military spending continues to shrink.

Defense contractors, the government, and the engineers themselves have all taken steps to cope with the loss of defense engineering jobs. Many of the services displaced engineers need are the same as for any displaced worker: skills assessment, counseling, job search skills coaching, and job development, including company-sponsored job fairs. However, engineers and blue-collar workers may require a different mix and duration of services, since the engineer's job search is likely to take longer and range more widely across the country .38

The most important of the relevant Federal Government programs for displaced engineers are the mandate for early notification of layoffs (WARN) and the program for reemployment assistance (JTPA/EDWAA). However, State and local EDWAA programs tend to focus more on the needs of blue-collar workers than of engineers and other white-collar workers, often from the belief that those with superior academic and professional qualifications are better able to fend for themselves-but sometimes simply from inexperience in dealing with professionals. State agencies vary widely in what they are prepared to do for engineers. In the 1991 recession year, when demands for services outran available EDWAA funds in a number of States, some State managers decided they had to sacrifice services for engineers and other professionals and save resources for needier workers.

On the other hand, most large defense companies are providing quite substantial outplacement services for their displaced engineers, managers, and other salaried workers-better services as a rule than are offered to blue-collar workers. State agencies

[36]Note that relocation assistance, while helpful to the workers involved, may have some ill effects on the community left behind, if it removes the more highly skilled, educated, or motivated people.

[37]Total defense engineering WOrk force estimated by OTA on the basis of BLS figures for total engineering employment (1.862 million in 1990) and National Science Foundation survey data on defense-related employment of engineers; National Science Foundation *U.S. Scientists and Engineers: 1986*, NSF 87-322 (Washington, DC: 1987). Loss estimate is based on an assumption that engineering positions are cut in the same proportions as positions in the private defense industry and in DoD civilian employment. However, if spending cuts for research, development, testing, and evaluation (RDT&E) are relatively smaller tbanforotherparts of the defense budget, engineering jobs could be affected less than other kinds of work and the number of positions lost smaller.

[38]It is common for highly paid managers and professionals to take a longer time than production workers to find new jobs after layoff. One provider of services for displaced workers estimated that for every $10,000 in pay it takes a month to find a new job.

that do provide assistance tailored to the needs of professionals often do so, initially at least, through projects set up by the companies, which can often act more quickly than the local government. The government provides funds and technical assistance, and often takes over service delivery after the initial company response.

The median cost of the outplacement services provided by 11 aerospace firms in 1989-90 was $1,000 per employee. Services typically included job search training, counseling, and the use of facilities to prepare resumes and reach potential new employers. Few companies provide grants for retraining, usually the most costly of services; GE Aerospace, with generous education and training grants for displaced employees, is an exception. Most company projects rely on government programs for training funds. However, few engineers are actually getting retraining or continuing education through EDWAA. Many displaced engineers have so far been able to find new jobs, and have not asked for retraining, but if they do the EDWAA project may not be able to comply. Meaningful training for engineers is likely to be longer term than the typical 4-month EDWAA training course; training for even a few engineers could use up all of a project's training funds. If EDWAA funds are available for an engineer's training, the DOL policy that discourages upgrade training could be an obstacle.

Not many firms have attempted large-scale retraining of engineers for new positions within the company. One of the few examples is a program at the Wichita Division of Boeing's Commercial Airplane Group that is training mechanical, civil, and aeronautical engineers from the military side of the firm in structural engineering. A few employers have supported programs to train engineers and scientists who are about to be laid off or retire to become high school math or science teachers. This is a more attractive option for retirees than for most younger engineers, since school teacher pay usually does not equal that for engineers, but it can be a highly beneficial option for society.

A stereotypical view of defense industry engineers is that they expect higher salaries than their civilian counterparts, are narrowly specialized in skills peculiar to defense and, in the case of those losing their jobs in the present cuts, are too old and set in their ways to adapt to a different environment. This reputation, which could handicap engineers seeking civilian jobs, appears to be unwarranted. Although much of the data is anecdotal, statistical evidence suggests that salary levels for engineers with comparable experience and academic qualifications are not clearly higher inside defense than outside. There is also evidence that a large number of engineers did in fact move from military to civilian jobs in the 1980s.

Some groups of engineers are having difficulty finding jobs during the current cutbacks: older engineers, those without bachelor's degrees (who therefore lack the broad foundation of technical knowledge that allows easy acquisition of new skills), middle-aged midlevel managers, and those who have spent a long time in narrow military fields.[39]

Typically, engineers have been willing to relocate to find new jobs; this is probably getting to be more difficult with the increasing prevalence of two-earner families, but it remains an important factor in displaced engineers' success in finding new jobs. What emerges as the most important factor, however, is whether the engineer has remained flexible by keeping technical skills up-to-date. Career-long education-a responsibility of both the engineer and the company, achieved through postgraduate courses and job rotation-is paramount.

VETERANS' ADJUSTMENT

By 1995, the U.S. active duty military forces will, according to congressional mandate, be 23 percent smaller than in 1990, shrinking from 2.1 to 1.6 million. This will make it the smallest military force the United States has had since 1950. The Army and the Air Force are facing the largest reductions both in absolute numbers and percentages.

To meet the reduced manpower levels Congress has mandated, some military personnel will have to be separated, or laid off, involuntarily. However, because of the high rate of turnover, especially in the

[39] A substantial number of displaced engineers could be in these categories. In 1986, 23 percent of employed engineers were over 55 years old, and 11 percent were recorded as lacking a bachelor's or advanced degree. (There maybe some overlap in these categories.) Data are not available on numbers of engineers in midlevel managerial positions or in narrow military fields. Source of the data is National Science Foundation *U.S. Scientists and Engineers:* 1986, NSF-87-322 (Washington DC: 1987), tables B-12 and B-14.

enlisted ranks, most of the reduction in manpower is likely to be accomplished through normal attrition combined with reduced levels of accession (enlistment). Involuntary separations are not expected to exceed 100,000 or about 20 percent of the total reduction. The officer ranks will be thinned by more involuntary separations, but these will probably still account for less than half of the reductions.

The numbers of dislocated military personnel are thus likely to be small compared to workers losing jobs in defense industries, but there are special problems involved. A top drawing card for the military services during the era of All Volunteer Force (AVF) has been job security. Involuntary separation of soldiers can have a negative effect on the morale of those who remain and may discourage others from enlisting. For these reasons, as well as equitable treatment of the Nation's service men and women, it is important that military separates make a smooth transition to the civilian economy.

In general, today's ex-service people should be better able to move into the civilian economy than their predecessors in the Vietnam and early AVF eras. The occupational distribution within the military is now more like that of the private sector; therefore, more soldiers should have transferable job skills. Perhaps more important, the education and aptitude levels of today's soldiers are higher than they have been at any point in the last 25 years, and are at least comparable to the levels of their civilian age cohort. Nearly all enlisted personnel today have high school diplomas.

Despite the relatively manageable overall impact of reduction in the military forces, it could have a bigger adverse effect on minorities, especially blacks. African Americans are several times more dependent on the military for employment than whites. Of all employed black men between the ages of 18 and 29, 10.6 percent are in military service, compared to 5.4 percent of white males. Not only are African Americans overrepresented in the military, they may again be overrepresented among those involuntarily separated. Because the military services have been integrated so successfully and have given unusual opportunities to minorities, the impact of the drawdown on young black people is of special concern.

In response to the planned reduction in forces, DoD, in cooperation with the Department of Veterans' Affairs and DOL, has developed several programs to provide transitional assistance to service people. Every departing service member will receive job search skills training in the Transition Assistance Program (TAP), a 3-day seminar that covers the basics of resume writing, interviewing, and looking for job leads. In addition, each of the military services has also developed its own program of transition assistance. The most advanced of these is the Army 's. The Army also faces the largest cut (50 percent of all reductions).

Benefits available to service people will include generous severance pay for those serving more than 6 years; like civilians, veterans will also be eligible for up to 26 weeks of unemployment compensation. In addition, more than 70 percent of servicemen and women have Montgomery GI Bill educational benefits. The GI Bill can provide up to $25,000 of tuition assistance. Many service members will also receive transitional health care and relocation benefits. Military personnel, unlike most defense industry workers, will have about 180 days of notice before being separated from the services.

While it is too soon to assess the success of the transition services offered by the military, the basic programs appear to be more accessible and complete than adjustment programs for displaced defense industry workers. The larger cost of the drawdown may be borne by those who will not be able to join up in the future-a genuine loss of opportunity for minorities and disadvantaged young people. This is also a loss to society, unless comparable training/education/ upward mobility opportunities are created in other ways.

DEFENSE-DEPENDENT COMMUNITIES

The number of State and local economies that are highly dependent on defense spending is not very large. Assuming that the national economy resumes growth at a healthy pace, most U.S. communities will not be seriously affected by spending cuts. However, places like Groton, CT, Bath, ME, and Newport News, VA, where defense has been the community's livelihood, are at risk. Closure of military bases or sharp drops in defense orders could cause real distress, especially in smaller defense-dependent communities. A few larger cities such as St. Louis, where the local economy depends considerably on defense dollars, will also be affected, though probably not to the degree of the smaller

places. Defense cuts could also add to the distress of some cities, such as Boston, that have already lost other sources of economic support.

Without detailed local analysis, it is not possible to pinpoint all the States or communities likely to suffer most from defense cuts. However, it is possible to identify factors that put communities at risk and suggest how economic development programs might mitigate the damage.

A major risk factor is defense dependence: the higher the share of the local economy that rests on military spending, the greater the vulnerability. As discussed above, the less-than-robust competitive condition of the U.S. economy adds vulnerability at the national level and may make recovery more difficult for affected communities now than in the post-Vietnam era. Factors that reduce vulnerability are a large, prosperous, and diverse local economy, as well as a growing national economy. Gradual reductions in defense spending over several years, as well as plenty of advance notice to affected communities, make the impacts more manageable.

Because per-capita defense spending is three times greater in metropolitan than in rural areas, larger cities are likely to bear most of the brunt of the cuts, and that is a hopeful sign. To the extent that defense cuts occur in crowded, expensive metropolitan areas such as Long Island, Los Angeles, and Washington, DC, and not in rural areas or slow growing cities, overall adjustment will be easier. In fact, lower defense spending in congested metropolitan places can have some offsetting effects by reducing the pressure in an overheated economy, stemming immigration, and possibly encouraging some outmigration. It can reduce relative business costs (e.g., rents, wages) and improve local quality of life (e.g., lower housing costs), which in turn can make recovery easier.

While any defense spending cuts can cause dislocation, fears of disruption from military base closings are often exaggerated. In fact, military base closings are likely to be easier for communities to tolerate than equivalent cuts in defense production or R&D. Military bases are usually less interconnected with local economies than defense manufacturing firms or R&D facilities, because they tend to buy less from local suppliers. The impacts on the local employment rate are less since most military people (and some civilians) from closed bases are transferred to other facilities and do not add to the rolls of the jobless locally. Finally, while the closure of a few bases could cause significant local impacts, the effects will be minor in most cases. The majority of closures in the first round will involve virtually no job loss. In fact, 52 of 91 facilities to be closed are stand-alone housing units. There are 3,800 DoD installations in the United States; 173 are slated to be closed or cut back in the two rounds. About 55 communities can expect more than minimal impacts from the closures. In 24 of these, jobs at risk at the base represent more than 1 percent of local employment. In seven of the communities, 2 to 8 percent of local jobs are at risk, and in six, 11 to 21 percent. On the other hand, some metropolitan areas whose economies are strong and diversified may actually benefit from using for other purposes the land these military facilities relinquish.

Reuse of closed bases for new civilian activities can create new jobs. However, the process can take time, especially if planning and redevelopment are delayed. Certain Federal policies and practices could threaten an early start. A critical element in successful reuse is prompt disposal of land, but disposal of base property can be cumbersome. There are legal obstacles (e.g., other claimants besides the local community, including Federal agencies and representatives of the homeless, have to sign off first); also DoD may not be fully aware that prompt disposal is important to community economic health. Another potentially more serious problem is that pollution at some bases could make civilian reuse difficult. Most DoD facilities have environmental problems, some so bad that they may be beyond remediation. Current law is unclear as to whether reuse of the nonpolluted part of the property can begin before a base is completely cleaned up. Environmental difficulties are already obstructing the transfer of several bases slated for closure.

Despite mitigating factors, some communities are very likely to suffer economic distress from the defense build-down-rising unemployment and outmigration, an eroding tax base, and underused public and private investments. Federal, State, and local economic development programs can soften the blow. But weaknesses in the funding, organization, and strategic orientation of these programs limit what they can accomplish.

Federal economic development and infrastructure programs played a significant role in helping defense-dependent communities adjust to the post-Vietnam

defense build-down. Today, States and communities cannot expect more than minimal assistance from this quarter. Federal programs are simply no longer funded at levels adequate to provide much meaningful help. Depending on how it is defined, Federal funding for economic development declined by 60 to 90 percent in constant dollars from 1978 to 1991. While the $50 million appropriated by Congress in 1991 for community adjustment to defense cutbacks is a significant increase, funding is still less than it was in the 1970s. Moreover, 1 year after Congress legislated that DoD transfer $50 million to the Economic Development Administration (EDA) for community adjustment, the finds still had not been transferred. If the build-down proceeds rapidly and if national economic growth remains sluggish, the resources for community adjustment will certainly fall short of what is needed.

A bright spot for communities is DoD's Office of Economic Adjustment (OEA), whose job is to coordinate a Federal response to community disruption brought about by military cutbacks. OEA provides communities with both technical assistance and grants for economic development plans. Staffed by competent professionals, OEA usually responds quickly and flexibly. However, OEA support stops at the preparation of plans. Many communities have a harder time with the next step of implementing the plans.

The EDA's Sudden and Severe Economic Dislocation (Title IX) program is the main Federal source of financial help to communities affected by defense cuts. Delays in releasing what funds are available and administrative inflexibility compound the general insufficiency of funds. Communities often wait a long time for approval of an EDA grant and meanwhile miss the chance to get a vital early start on efforts to stimulate economic recovery. Because it is impossible to predict which communities will be most affected by reductions in defense spending, and when it will happen, rapid, flexible response is particularly important.

With the shrinkage in Federal programs, the mantle for economic development has passed to the States and localities. Many of them have put in place aggressive economic development programs and strategies, including business finance, manufacturing modernization, technology development, management assistance, and export programs. However, the increased State and local activism has not fully compensated for the decline in Federal support. Nor are all States and cities so activist; some have well-funded, well-designed, and innovative programs, but others do not. Recent budget difficulties in States and cities have made matters worse. Many of the State and local efforts, including some of the best, are being cut back or eliminated in the face of budget crises.

Two additional factors make economic development efforts less effective than they could be. First, despite widespread recognition that industrial recruitment or "smokestack chasing" is a zero-sum game, many cities and States still play it. At a time when, more than ever, States and cities need to invest in infrastructure, education, and programs for improving manufacturing competitiveness, they often find themselves caught in a self-defeating race to see who can provide the biggest subsidies to companies considering moving. Worse, economically distressed areas are not the only ones bidding for firm relocations. Communities that are quite well off also compete, making it more difficult for those hurt by defense cuts or other blows to their economy to attract needed industry.

Another serious shortcoming of some public economic development programs is too much focus on financial incentives that reduce short-term costs of business, instead of services that help manufacturing and technically oriented service firms develop new products, increase productivity and quality, and find new markets. Costly business subsidies are not aimed directly at improving competitiveness. Industrial service programs are.

Some States and cities have recognized these weaknesses and are taking steps to improve their efforts. A new model of economic development is emerging. It provides a full range of industrial services to manufacturing and technically oriented service industries, including training for workers and managers, selection and use of modern equipment, support for product innovation, marketing, financing, and promotion of cooperative industrial networks. Often the services are provided by intermediate nongovernmental organizations that have the specialized knowledge needed to work effectively with particular industries. Business organizations are often active players in designing, funding, and operating these services. An important feature is access in one place to the range of services. Too often, governments establish separate programs for

various business needs (e.g., financing, marketing, technology). Firms must then be adept at locating the right agency, whether at the Federal, State, or local government level-or perhaps in a university—to find the help they need.

Another important feature is to target economic development programs to the kinds of enterprise that are basic to the local economy, that create economic activity and jobs in other sectors (i.e., have a high multiplier effect), and that sell goods and services outside the local community. For example, a manufacturing plant or a service enterprise that sells to more than local customers would get more support than a mom-and-pop dry cleaning plant. Most public economic development programs, particularly at the Federal level, are not targeted to industries that generate added economic activity.

Given the problems and weaknesses of economic development programs, how well have they worked in the past? Are they likely to lessen distress from defense spending cuts in the future? While little systematic work has been done on their effectiveness, informed opinion and anecdotal evidence indicate that the programs do make a difference but cannot by themselves revive a stalled community economy. Local communities in serious economic trouble require other favorable factors working together-most importantly, a growing national or regional economy. However, economic development programs can surely work better if they are funded adequately and the money is spent on genuine services to industry rather than on subsidies to recruit firms or incentives to lower business costs.

DEFENSE COMPANIES

Defense companies are facing serious long-term adjustments. In constant dollars, defense outlays were higher in the 4 peak years of the 1980s than in any 4-year period of the Vietnam or Korean Wars. Although defense spending as a share of GNP never reached the heights of those earlier wartime periods, DoD sales in the 1980s were fully as significant to companies doing military business as at any time since World War II.

Declines in defense spending are now cutting deeply into programs that defense companies expected to sustain them for years to come. These cuts are threatening the stability, perhaps the existence, of some defense contractors. This raises concerns that a weakened industrial base may not be able to meet future defense needs. OTA is addressing these national security concerns in a companion assessment; this assessment is concerned with issues related to defense companies from the standpoint of the civilian side of the economy.

On the civilian side, the chief worries about the survival of defense companies include effects on jobs, communities, and technologies that could support commercial competitiveness. Effects on jobs are already evident, with tens of thousands of layoffs by defense companies in 1990-91. Some communities are feeling the pinch, especially where defense cutbacks aggravate the effects of recession.

The other major concern about defense companies is that if they shrink drastically or close down R&D facilities, valuable experience and technologies will go with them. The huge amount of defense spending in the past four decades has resulted in some remarkable advances in commercial technologies, though there is some evidence that benefits to the civilian side have slowed in recent years. Even though military R&D and production may not be efficient or reliable sources of commercially important technologies, they have had beneficial effects through sheer size. If labs close down, production lines stop, and teams of people disappear, the tacit technological knowledge those teams possess can disappear, too.

The strategies of major defense companies in the face of spending cutbacks are considered here from the perspective of jobs, communities, and technologies. A major question is the potential for conversion in both large and small defense companies—that is, replacing lost military business with commercial business in ways that use the current work force and develop commercial applications for military technologies. Some of the implications of companies' adjustment strategies are touched on only briefly here, and are reserved for a later report. The potential for redirecting technological resources-including those that defense companies possess—from military purposes to dual use or strategic commercial applications will be the subject of a second and final report in OTA's assessment of Technology and Economic Conversion.

The Outlook for Major Defense Companies

The top defense companies, in terms of the dollar amounts of DoD prime contracts they receive, vary greatly in their dependence on government sales.

Some, like General Dynamics, Grumman, and McDonnell Douglas, count on DoD for over half their sales. Another group, including Martin Marietta, Raytheon, and Lockheed, are heavily dependent on the government for their sales, but their major customers include other agencies besides DoD-notably NASA and the Federal Aviation Administration. Still others are diversified commercially, counting on the defense for less than one-third of their sales; this group includes United Technologies (the parent company of the aircraft engine manufacturer Pratt and Whitney), Boeing, and Rockwell International. A final group is made up of large firms that are fundamentally commercial but maintain defense divisions; among them are General Electric, Westinghouse, General Motors, IBM, GTE, and ITT.

From the community and workers' point of view, however, this description is misleading. Defense dependence at the corporate level gives an idea of the vulnerability of the company, its managers, and its stockholders to defense cutbacks, but it does not accurately portray the impacts on jobs in particular communities. For example, General Electric as a corporation is low in defense dependence, but its aerospace division is essentially a defense company. When GE Aerospace employment drops from 7,800 to 2,900 in a town like Pittsfield, MA, with its population of 50,000, the community effects are just as devastating as if a whole defense company had gone out of business.

Most large defense companies see two principal options: one is to stay concentrated in defense and the other is to broaden out into the civilian economy. Most companies are following more than one of the strategies outlined below, although they may single out one as their main choice.

Companies that decide to stay concentrated in defense may have to shrink substantially, laying off workers and getting down to a smaller core defense business. They may also try to increase military exports, as part of their overall plan to adjust to lower levels of U.S. defense spending. Although international competition for defense markets is intense, the superior performance of American weapons in the Persian Gulf War has increased foreign demand for them. A policy allowing increased export of U.S. weapons might help a few of the larger defense companies maintain profits in the short run, but it would also increase the risk of proliferating advanced conventional weapons and the associated military technologies.[40]

If the option chosen is greater activity in the civilian economy, one alternative is to diversify at the corporate level through purchase of going concerns that already sell commercial products. An option in the aircraft business, and perhaps a few others where military and commercial products have much in common, is to switch resources into making the commercial product, The potential for this kind of switch is probably greater with subsystems and components than with end products, though much depends on the companies' marketing abilities. Some firms, figuring they know how to deal with the government, are pursuing nondefense government agencies as customers for systems and technologies originally developed for the military. Not part of company plans, but an interesting possibility from the standpoint of technology transfer, is the startup company formed by a few entrepreneurs peeling off from R&D labs of large defense fins, to exploit technologies of military origin for commercial markets. The option that comes dead last, in the estimation of most large defense companies, is what is usually termed conversion: that is, the company itself develops a new commercial product line that makes use of plant, equipment, work force, and technological know-how formerly devoted to military products, and lines up the financing and marketing needed to make large-scale production viable.

The main reason defense companies give for reluctance to venture into commercial production is the great differences in company practice and culture between defense and commercial business. Most large defense contractors that assemble complex weapons systems or make major subsystems are geared to low-volume production of highly specialized, expensive equipment. In designing the equipment, the main emphasis is on technical performance. In contrast, many commercial products have to combine reliability and affordable cost with high-volume manufacture. The DoD practice of imposing rigid, detailed specifications and standards throughout procurement further exaggerates the differences. Still more pervasive are different management prac-

[40]For a discussion of the international arms trade, see OTA's recent assessment, *Global Arms Trade: Commerce in Advanced Military Technology and Weapons,* OTA-ISC-460 (Washington, DC: U.S. Government Printing Office, June 1991)

tices. These are, in large part, a response to close government supervision, which involves detailed recordkeeping and frequent reviews and audits—and Criminal liability for failure to comply with the government requirements. The reason for requiring such detailed oversight has been the government's concern to prevent fraud and waste of the taxpayers' dollar. But it does add to the differences in commercial and defense company culture, requiring a different outlook and abilities in managers and officers. And it creates high overhead expenses that are passed along to the government, but would be a heavy burden in commercial markets. An important factor beyond all this is that commercial marketing and distribution are alien to defense companies and divisions. Finally, many defense companies are burdened with a heavy load of debt. They are not in financial condition to launch risky new enterprises.

The record of defense companies' attempts at conversion in the 1970s is not quite the unmitigated disaster that is often portrayed. There were some modest successes, especially in technological innovations. There were also some large technological failures, as aircraft companies ventured into the unfamiliar but seemingly simpler businesses of making light rail cars and buses. It proved harder than it looked. Another significant factor was the different demands on managers in a commercial versus a defense business, including both manufacturing and marketing know-how. Finally and importantly, the companies' difficulties were compounded by shifting government policy. For example, after a few years' experience, Boeing managed to correct the technical problems that originally plagued its light rail cars; Boeing-manufactured cars are still giving satisfactory service in Chicago and San Francisco. But when the Federal Government first drew back from a policy of promulgating uniform national standards for light rail cars and then, in the early 1980s, sharply reduced support for mass transit, the long-term prospects for light rail cars took a nosedive. At the same time, the government's vastly increased orders for military hardware promised greater profits in that direction.

The fact remains that many defense companies have developed technologies for military use that they recognize as possessing commercial, or at least nonmilitary, promise. The easiest move is into nondefense sales to governments. Also, it is more feasible to move into products, as well as markets, that the defense companies know best. Two kinds of products that seem promising are information management systems and monitoring systems that rely on remote-sensing devices. The latter might find application in environmental programs, as well as in security systems. In addition, defense technologies that have achieved high performance in hostile environments might find uses by commercial companies that operate under similar conditions (e.g., in the deep sea, the desert, or polar regions).

The same factor, product similarity, also makes it feasible for many companies in the aircraft business to shift from military to commercial work. None of the dedicated defense companies that do final assembly of military airplanes plan to become full-scale commercial airframes but all are doing subcontract work for the commercial companies or plan to do so. Some have gone into repair and rework of commercial aircraft on a fairly large scale. At the subsystems and components level, the opportunities to shift to the commercial side are still greater.

What major defense companies are reluctant to do is embark on large-scale production of big hardware systems with which they have no familiarity+. g., subway cars. The transit business was frustrating to aircraft companies in the 1970s not only because of their technological and management inexperience, and consequent false starts or failures, but also because of inconsistent government policy. However, there could be a new opportunity in the 1990s for defense companies to use their technical expertise in developing some challenging new transportation technologies-electric vehicles, "smart" cars and highways. In California, the State government strong support for developing these technologies makes the prospects more attractive.

Small Business and the Defense Industry[41]

Many large companies in the defense business can expect to survive cutbacks, though perhaps at the cost of brutal downsizing. Many smaller companies face just two choices: get more commercial business or go under. Not only the motivation but also the opportunities for switching over may be greater for small firms, which typically make parts and components, than for large prime contractors whose

[41] A small business is defined as one that is independently owned, is not dominant in its field, and has no more than a specified number of employees (500 to 1,000, depending on the product). For service companies, the criterion is dollar volume of sales.

business is assembling big ticket items such as tanks or missiles. Machine shops, for example, regularly use the same tools and processes to make metal parts for trucks as for tanks.

Although information about small defense companies is limited, it appears that they supply a significant share of DoD purchases of goods and services. Roughly one-third of the total DoD buys from private businesses, directly through prime contracts and indirectly through subcontracts, comes from small business.[42] There is also evidence that most small defense firms have both military and commercial customers. It seems reasonable to expect that these small companies are in position to increase their commercial sales. In these small fins, the managers and work force, very often the production equipment, and sometimes the product itself are the same for military and commercial customers. Unlike larger companies that have both defense and civilian business, small companies rarely have separate defense divisions. Small metalworking companies, in particular, are inherently dual use.

While it may be technically feasible for these companies to substitute commercial work for declining defense contracts, it is not necessarily easy. There may not be enough commercial work to go around. Aside from this difficulty, many small companies prefer commercial to defense business. The owner of one small metalworking shop explained that there is no loyalty in DoD contracting and little repeat business, which means there is a new learning curve on each order, which in turn lowers profits. DoD business also involves waste of time-in waiting for contracts, waiting for clarification of drawings, extra paperwork, and the incredible detail of military specifications, down to packaging. With commercial customers, the shop can develop long-term relationships and trust, take orders or ask for clarifications over the phone, and get orders for many different parts or long runs of particular parts without going through new bids and competition.

The main worry of most small to medium-size defense firm in shifting to more commercial business is in sales and marketing. Those who have succeeded have indeed made vigorous efforts to sell to new customers, including hiring a new sales force with experience in the commercial world. But efforts did not stop there. Successful companies also had to improve productivity and lower costs. In some cases, this was achieved by a new management style based on improved worker training and labor-management collaboration.

Several government programs that are designed to assist small business generally could be suitable for helping small defense firms expand their commercial business-notably, technology extension and other kinds of technical assistance.[43] The contribution technology extension can best make to small firms is not so much state-of-the-art products straight out of the R&D lab, but rather acquaintance with best practice in manufacturing. In addition, these firms can make good use of financial, marketing, and product development assistance, especially if these services are provided in a one-stop center. States are the chief providers of this kind of assistance (the Federal program of technology extension to small manufacturers is still very small and new), but few offer a broad, integrated, well-funded range of services.

POLICY ISSUES AND OPTIONS

Several Federal programs are in place to help workers and communities adjust to economic disruption, and a few exist to help companies improve their competitive performance. These programs can be extended to help workers, communities, and companies affected by defense spending cutbacks; in fact Congress has already earmarked extra funds for defense-related adjustment efforts, But the programs

[42] Small and medium-size firms (' 'small business' received 19 to 20 percent of DoD prime contract awards over the past decade. Complete figures on subcontracts are not available, but it appears that subcontracts bring the total for small business to about 35 to 37 percent. See ch. 7.

[43] Two recent OTA reports, *Making Things Better: Competing in Manufacturing*, OTA-ITE-443 (Washington, DC: U.S. Government Printing Office, February 1990) and *Competing Economies: America, Europe, and the Pacific Rim, OTA-HE-498* (Washington, DC: U.S. Government Printing Office, October 1991) discuss in some detail options for improving technology diffusion to small and medium size manufacturers. They also discuss broader options for improving competitiveness of U.S. manufacturing, including options to improve the U.S. financial environment for long-term investments in new technologies and modem production equipment; to upgrade education and training of American managers, engineers, and production workers; and to form industry-government partnerships for R&D in commercial technologies that are risky or long-term but have the potential for large public benefits. *Competing Economies also* considers options for creating a new governmental body that, in collaboration with industry representatives, could develop and supervise a strategy for raising U.S. competitiveness. A strategic approach would coordinate the financial, human resource, and technology policies mentioned above, together with trade policies where appropriate, to foster the growth and survival within the United States of industries that create well-paid jobs and advance knowledge.

need improvement in quality, reach, and resources if they are to be effective in easing the transition to a more commercially oriented economy.

State and local agencies run the day-to-day operation of federally funded programs for displaced workers. Their performance is highly uneven. A few do an excellent job, many fall considerably below that level, and some do very little at all. Strong Federal efforts are needed to help bring the performance of the average State program nearer to the level of the best. A signal weakness of many displaced worker programs is failure to respond promptly to calls for help. While current Federal funding for the displaced worker program is generous compared to levels in the past, the 1990-91 recession has increased needs for services and is straining many States' ability to react.

The main Federal economic development programs-located in the Commerce Department's Economic Development Administration (EDA)--have been starved for funds and repeatedly threatened with extinction for the past decade. They may now lack the institutional know-how to offer effective help to defense-dependent communities. They are certainly underfunded compared to the post-Vietnam era, despite recent increased appropriations from Congress.[44] In the past decade, many States and communities took over responsibility for aggressive, innovative economic development programs, but not all have done so. Today, some of the best are slashing their programs because of budget crises.

Defense companies that want to convert to more commercial production could benefit from government programs that offer technical assistance for manufacturing modernization, better marketing, improved management, and possibly financial aid to acquire up-to-date production equipment. Some government programs of this kind exist, mostly targeted to small and medium-size manufacturers. They could offer real help to defense companies in conversion efforts, as well as improving competitiveness among manufacturing firms generally, if they were widely available. They are not. Federal programs for this purpose are small and new, though Congress has shown considerable interest in expanding them. Programs at the State level are a bit more numerous and experienced but are nevertheless scattered and underfunded. Once more, States' performance is uneven.

Some of these programs can give a real boost to economic performance, growth, and prosperity. Some, however, are mainly reactive. They apply band-aids. And the band-aids have been applied repeatedly in the past decade, as American industry struggled to meet increasingly adept foreign competition. There are other, more proactive choices.

In the post-Cold War era, there are some signs that a new national purpose is taking shape, based on a redefinition of national security to include excellence in economic performance, the provision of a comfortable and rising standard of living for all Americans, and renewed leadership in a more peaceful, prosperous, democratic world. Several new national initiatives could contribute to this purpose. One might be a strong commitment to environmental protection and cleanup that would also promote an internationally competitive environment industry. Another could be rededication to top quality education and training so that our managers, engineers, and workers are equal to the world's best. A third possibility is restoration of a first-class transportation and communication infrastructure, including support of advanced technologies such as electric cars.

This report focuses mainly on adjustment programs and policies. Discussion of new national initiatives that could generate new technologies, spur the formation of new enterprises, and contribute to greater industrial competitiveness is reserved for the final report of this assessment. Adjustment programs can help displaced workers find better jobs sooner than they might on their own; they can help keep distressed communities from falling into a downward spiral; and by working with firms on adoption of best-practice technologies and new product development, they can make a real contribution to improving American industrial competitiveness. But they are not the whole story. It takes a wholehearted national effort in everything from public school education to technology partnerships between government and industry to grow the knowledge-intensive, wealth-creating industries the Nation needs to strengthen its economic security.

[44] In fiscal year 1978, total funding for EDA was $957 million (1990 dollars) and in fiscal year 1990, $216 million. EDA's principal program for economic development aid to distressed communities (Title IX) was funded at $137 million in 1978 (1990 dollars) and at $48 million in 1990. The regular Title IX appropriation for 1990 was $24 million, but Congress provided an extra $24 million to help communities damaged by Hurricane Hugo.

Displaced Defense Workers

The federally funded EDWAA program is the main source of reemployment and retraining help for workers displaced from defense industries, and is also open to displaced DoD civilian workers and ex-members of the armed forces. Building on nearly a decade of experience, the EDWAA program has inched upward in the proportion of displaced workers served and has a respectable record of placements for participants. A major failing of the program has been and continues to be uneven quality from one State to another. Federal program managers cannot solve this problem alone. The law gives much of the responsibility to States and localities. But it is up to DOL managers to make stronger efforts than they have so far to collect information from the best-run State programs, share it with the others, urge and help the average State to do better, and strive to make relationships with State EDWAA officials collaborative, not adversarial. Regular, structured meetings at the regional level could help to make Federal technical assistance effective. Congress may wish to encourage these efforts through oversight.

Rapid response is the problem most in need of attention. All the States need to understand that rapid response means genuine delivery of services as soon as possible in one well-located center—not a single visit by a State official telling workers where to go to apply for unemployment insurance. Congress might consider requiring States to report on how quickly they arrange for these services to be provided after notice of layoff. This would help to identify States that are doing poorly and need help or incentives to improve, and those that are doing well enough to serve as models.

Another approach is to encourage faster and more flexible responses by DOL to proposals for EDWAA discretionary funds, which the Secretary of Labor controls+ specially since all the extra $150 million earmarked for displaced defense workers is in these discretionary funds. One option would be to direct that DOL allow State and local agencies to pay themselves back from these funds, if and when granted, for money they have advanced up front for rapid response. Also, Congress may wish to encourage DOL to simplify the requirements for proposals for discretionary funds.

Congress might revisit the issue of training. The 1988 amendments to EDWAA require that every project spend half its funds on training (unless, in specific cases, the State Governor reduces the requirement to 30 percent). The amendment has the laudable purpose of encouraging training, but it does reduce project flexibility and may be counterproductive in projects serving professionals and managers. (Defense industry layoffs so far have included a relatively high proportion of engineers and related professionals; many of them do not want or need retraining.) Yet while both the law and DOL insist on the primacy of training, DOL policy discourages the use of EDWAA funds to improve a worker's skill in his or her same occupation, if the worker already possesses marketable skills. This could affect both professionals and blue-collar workers who want to take advantage of EDWAA-funded retraining to improve their skills, their appeal to employers, and their earning power. It is not only hard on the individual worker involved, but could defeat the purpose of providing a more adept and highly skilled work force to U.S. industry and thereby improving competitiveness. Congress might wish to state explicitly that EDWAA funds may be used for displaced workers to upgrade their skills.

Many of the options to improve EDWAA services for displaced workers in general apply equally to engineers (e.g., rapid response). Displaced engineers' retraining needs are often special, however. As noted, many engineers have salable skills and don't want retraining. On the other hand, meaningful training for the engineers who want it could take an inordinate share of an EDWAA project's budget. Government-sponsored retraining for engineers might be designed specifically for them, especially since there is a long-recognized but often unmet need for continuing education for engineers, whether or not they are displaced. Congress might wish to consider adding other government sources besides EDWAA for engineers' training. For example, the National Science Foundation might provide grants and scholarships for continuing education for engineers; or something like the 1950s-era National Defense Education Act might be revived to pay tuition for displaced or retiring engineers who want to teach math or science in public schools.

Congress might also want to consider the option of providing Federal support for retraining workers who are currently employed in defense companies. Managers, engineers, and production workers might

all benefit from training in technologies and skills that are needed in commercial production. In general, EDWAA funds can be used only for workers who are laid off or have received notice of layoff, but a portion of the extra $150 million that is earmarked for displaced defense workers can be used in demonstration projects for training of active workers; Congress might wish to encourage DOL in such a project.

Another aspect of EDWAA as amended in 1988 might be reexamined by Congress. The law requires that 60 percent of the EDWAA funds allocated to each State be further allocated to substate areas, with substate grantees in charge of running the local programs. Very often, States appoint as substate grantees Service Delivery Areas (SDAS), which are responsible for the larger JTPA employment and training program for low-income and disadvantaged people and often have little experience dealing with displaced workers. The mandatory allocation system has had only a 2-year trial so far. Through oversight, Congress might wish to examine how it is working in several respects: 1) Does it splinter the States' EDWAA funds into such small portions that it is hard to create viable entities? 2) Does it deprive States of the flexibility needed to respond to unforeseen displacement? and 3) Are SDAs generally the right service providers for displaced workers, or should States look further for grantees?

Finally, Congress may wish to keep a close watch on EDWAA funding to see whether the present funding, even though generous by the standards of the past, is adequate. The recession has already presented many States with more demands for services than they can meet. Furthermore, as programs improve--especially if rapid response becomes more widespread--demand for services is likely to rise. The difficulty of predicting when demands stemming from defense reductions will be at their greatest underscores the importance of keeping an eye on adequacy of funding. Multiyear tiding, as Congress provided in the DoD appropriations for services to displaced workers and distressed communities, are especially useful when the timing of maximum impacts is so uncertain. Equally important is streamlined program administration that will allow these funds to get out quickly to the States and localities where they are needed.

Defense-Dependent Communities

Federal funding and institutional capacity to help communities recover from economic losses is at a low level. Not only is Federal economic development funding itself cut to the bone, compared to the post-Vietnam build-down, but Federal infrastructure programs of the 1970s that had the added effect of promoting community development are gone or nearly so. The Commerce Department's Economic Development Administration, weakened by years of struggle to stay alive, has little ability to originate or carry out innovative programs, and is hampered by inflexibility and delay in responding to communities' calls for help. DoD's small Office of Economic Adjustment (OEA) is fleeter and more flexible, but its services stop with planning; also, it has more experience with military base closings than with defense plant cutbacks or shutdowns.

In October 1990, Congress appropriated an extra $50 million in DoD funds, to be transferred to EDA for economic development assistance to defense-dependent communities in fiscal years 1991-93 (the funds had not yet been transferred at this writing, 1 year later). This is a notable increase over the $12 million otherwise available to EDA's Sudden and Severe Economic Dislocation (SSED) program, but is far short of the resources available in the 1970s.[45] States and localities have put some creative and useful economic development programs in place, but many States are now running short of funds and cutting the programs.

Congress may wish, first of all, to monitor the availability of funds for economic development assistance to defense-affected communities, and consider providing more if needed. Congress may also wish to encourage faster responses to community distress and concentration of limited resources on the most effective measures and the neediest communities. Congress might opt to set deadlines for response to community proposals; or it might allow OEA to give planning grants to defense-dependent communities before plant closings are announced. OEA and EDA could focus efforts on communities with a large proportion of jobs in defense and with high unemployment and low job growth. They could encourage and assist States and communities to target their business development

[45] The SSED program is under EDA's Title IX program, which also includes assistance to communities suffering from longer term decline. The regular appropriation for all of Title IX was about $24 million in fiscal years 1990 and 1991.

assistance to industries that are basic to the local economy, that generate economic activity in other sectors, and that sell goods and services outside the local community.

Because States are now the main actors in economic development efforts directed toward growing new businesses and expanding existing ones, Congress may wish to direct some Federal funds into support of those programs (as discussed below). Also, Federal economic development agencies could be encouraged to collect and share with other States information on the best of these State programs.

Finally, Congress may wish to consider some adjustment in policies related to closure of military bases. Although the communities facing serious problems from base closings are relatively few, recovery in these communities could be difficult, especially if base reuse efforts do not begin promptly. To speed these efforts, Congress might direct or encourage base commanders to work with local communities in rapid transfer of property, possibly vacating sections piecemeal and leasing them on an interim basis. Congress might wish, in a very few cases of exceptional defense dependence, to direct that DoD transfer property to communities at below market prices, or even free. Perhaps the most important obstacle to transfer of base property is interpretation of the law to require environmental cleanup of the entire property before any part of it can be transferred. Congress may wish to allow DoD to transfer portions of bases as they are cleaned up. Also, priority for cleanup might be given to bases scheduled for closure.

Defense Companies

Although some major defense companies consider the strategies they adopt in response to defense cutbacks their business alone, there are possibilities for a constructive government role in the transition of defense companies into more commercial activities. The potential is perhaps greatest for small and medium-size companies. Many already have some commercial customers, but need to shift to more commercial production to survive. Technical, marketing, or financial assistance from government programs can help some small firms make the shift.

As a first step, Congress may wish to add resources and focus to existing programs for technology diffusion that could also help defense companies make the transition to more commercial production. At the top of the list is a Federal-State partnership. Congress might wish to expand significantly the National Institute of Standards and Technology (NIST) program of support for existing State technology extension programs (STEP). So far the STEP program has been limited in scope, with finding never more than $1.3 million a year. The defense authorization act passed by Congress in 1991 provided for a much broader program of Federal support for State technology extension efforts, to be funded at $50 million a year. However, Congress declined to fund the program for fiscal year 1992. Nevertheless, congressional interest in stronger support for technology extension programs for small and medium-size manufacturers appears to be growing. For example, Congress raised the FY92 appropriation for the Federal Manufacturing Technology Centers supervised by NIST, to $15 million from $10 million the year before.[46]

A more comprehensive option would be Federal support for State programs that offer a wide range of services to improve companies' performance, including such things as financial and marketing services, worker training, and projects to generate new technology development, as well as manufacturing modernization. Federal support might be designed to encourage States to provide an array of services in one center (e.g., Pennsylvania's Industrial Resource Centers). Defense companies might be singled out for priority in such programs. Federal finding of about $25 million per year would be enough to help States serve as many as 5,000 to 20,000 defense firms, depending on the level and kind of service.

Another option Congress might wish to consider is technology assistance to help small firms create cooperative networks for purchase of equipment, bids on large contracts, and marketing efforts. Still another would be to form a government purchase and leasing system for modern production equipment, such as computer numerically controlled machine tools or robots. The system could serve two purposes: to be a reliable purchaser of U.S.-made advanced equipment, and a supplier of the equip-

[46]The purpose of the centers is demonstration of up-to-date technologies and diffusion of the technologies to small and medium-size manufacturers; five centers have been established and a sixth will open soon.

ment at subsidized rates to U.S. manufacturing fins, especially small fins. Such a system might be particularly helpful to small defense firms wishing to convert to commercial production, but would also contribute more generally to stronger performance by American manufacturers. The cost to the government of such a program might rise from about $5 million in the first year (assuming a modest beginning) to a few tens of millions per year for a mature program.[47]

Another set of proposals might be useful for defense firms that see possible commercial applications for technologies developed for the military, but are unwilling to bear all the risks involved.[48] A small program for government-industry partnership in generating new technologies already exists (NIST's Advanced Technology Program); Congress increased funding for the program to $47 million for fiscal year 1992, up from $36 million the year before. Another idea is to found regional Critical Technology Application Centers, based around geographic concentrations of firms and supported cooperatively by industry, the Federal Government, State and local agencies, and universities, to help firms commercialize critical technologies.[49] Still another proposal is to establish companion government-industry cooperative programs in the Departments of Defense and Commerce to develop commercial applications of defense companies' military technologies.

Congress might wish to give tax breaks to defense companies converting to commercial production, possibly in the form of a tax credit for R&D to develop commercial products, or as accelerated depreciation for investments in new production equipment. There is some question about the efficacy of such tax measures, and they are certainly expensive---especially tax incentives for investments in new equipment.[50] The problem of expense is aggravated in a time of towering budget deficits. However, the relatively high capital costs paid by American manufacturers are a distinct competitive disadvantage; U.S. firms generally would benefit from lower capital costs, to stimulate long-term investments in new technologies and equipment. If Congress wishes to consider tax incentives to stimulate long-term investment, the potential benefits from making the incentives broadly applicable are clearer than the benefits from limiting the incentives to conversion by defense companies.

There is one kind of tax incentive that might usefully be targeted to defense companies. Defense companies that do not want to enter commercial production themselves might still be encouraged to help entrepreneurs do so. Congress might consider giving favorable tax treatment to investments by large companies in startup companies formed for the purpose of developing commercial applications of military technologies; for example, the large company might be allowed to deduct such investments from taxable income. Alternatively, the same tax treatment could be available to any large company that provides financial assistance to a small entrepreneurial spinoff company, whether or not the technology involved was originally military.

Finally, Congress might direct DoD to abolish its requirement that companies pay the department back for what it spent on a military technology if the company develops the technology commercially and sells the product to a non-DoD customer. Nothing in law specifically requires DoD to demand a payback under these circumstances. The requirement is inconsistent with laws that encourage granting private companies intellectual property rights to technologies developed in Federal laboratories, and is an impediment to commercialization of military technologies. DoD's insistence on control over data rights related to development of military technologies and systems could also be a barrier to commercialization. Congress may wish to encourage DoD to work with industry on a settlement of this issue in ways that protect legitimate government interests but also allow companies to keep data rights secure, so that commercialization of the technology is more appealing.

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[47] A similar program in Japan leased or sold (on preferential installment purchase terms) $350 million of equipment in 1987. Assuming that the government paid 20 percent of that cost, in subsidies and administrative expenses, the government cost would be $70 million a year.

[48] For further discussion of this subject, see OTA, *Making Things Better*, op. cit., *Competing Economies*, op. cit..

[49] The Defense Authorization Act authorized $50 million for Critical Technology centers, but the conference committee on appropriations declined to fund the program.

[50] OTA, *Making Things Better*, op. cit., chs. 2 and 3, and *Competing Economies*, op. cit., ch. 2, discuss the financial environment for long-term capital investments in the United States, comparing it to the more hospitable environments of Japan and Germany. Both reports discuss several options for improving the U.S. environment (including tax incentives).