Chapter Five

DUAL-USE PRODUCTION

At the outset of defense downsizing, Congress and others expected that its effects on the economy and the defense industry might be alleviated by aggressive transfer of defense technology to commercial applications. An increased overlap between defense and commercial production is also seen to be desirable to maintain an adequate industrial defense capacity, improve efficiency in the defense sector, and allow for technological spillovers between the commercial and defense spheres (National Economic Council, 1995; Office of Science and Technology Assessment, 1994).

To encourage an increase in the overlap between defense and commercial production and promote the development of dual-use technology, the Clinton administration provided close to $1 billion per year from 1993 to 1995 for its dual-use technology initiatives. The program defines dual-use as broadly encompassing products, services, standards, processes, and acquisition practices that are capable of meeting requirements for military and nonmilitary applications. It provides funding to overcome perceived barriers to dual-use production, including lack of access to capital, high risks, and onerous federal regulations governing contractual requirements.

In our interviews we asked about each firm's experience with dual-use products and production processes, about their advantages and disadvantages, about use of government programs supporting dual-use, and about changes that DoD might consider in order to make dual-use production more feasible. This chapter discusses our findings regarding the extent of dual-use production, dual-use production processes, and barriers to increasing dual-use production.

Firms' use of governmental programs to encourage dual-use as well as other governmental assistance programs related to defense downsizing are discussed in the next chapter.

EXTENT AND CHARACTERISTICS OF DUAL-USE PRODUCTION

With regard to dual-use production, firms in our sample fell into one of two groups: (1) they made products for both defense and commercial aerospace or (2) they made products for nonaerospace commercial applications in addition to producing for the defense and commercial aerospace industry (Table 5.1). Although the extent of dual-use production varied significantly among firms, all firms saw the advantages for economies of scale, evening out the business cycles in the two/three markets, and hedging against defense cuts to outweigh the costs. None of the firms interviewed produced exclusively for defense, a finding seemingly in contrast with earlier studies of dual-use, which had focused on the larger prime contractors.[1]

Firms that produce exclusively for aerospace indicated using the same production processes for products manufactured or assembled for aerospace defense or commercial applications. Our respondents

Table 5.1

Differences in Dual-Use Processes by Type of Firm

Type of Firm	Number Using Identical Processes	Number Using Significantly Different Processes
Produce for aerospace market only	12	1
Produce for aerospace and other commercial markets	10	2
Total	22	3

[1]For instance, after surveying 206 (primarily large) companies with $60 billion in federal sales, van Opstal (1993) concluded that most companies that operate in both the commercial and federal markets either physically segregate some portion of their operations or set up a separate data management system to do business with the government.

stressed that there were no real differences in the product requirements—precision, testing, and quality control—required by these two markets. They used the same machinery and assembly processes.

Firms in the second group also indicated making no major differences in their production processes for defense and commercial applications (including the auto and sports equipment industries) even though precision and quality control requirements were generally less stringent for commercial applications.[2] In most cases, defense requirements drove their production process. Only one firm in our sample had (recently) separated physically its defense from commercial production lines. This separation was seemingly not instituted because of production incompatibility for its dual-use products; rather, it was instituted as a means to overcome difficulties the firm had had in meeting cost accounting and quality assurance requirements in its defense products. Another two firms had separate stockroom and testing facilities for defense and commercial products.

ISSUES IN DUAL-USE PRODUCTION

Defense procurement regulations—including accounting requirements, specifications and standards, and other unique contract requirements—are often cited as barriers to dual-use production. Nevertheless, all firms in our sample adjusted their accounting, testing, quality control, and production processes to meet the requirements of the defense and commercial markets with the attitude that it was a given, i.e., part of doing business.

This is not to say that there are no differences (hence, costs) associated with dual-use production. Chief among various differences mentioned by our respondents were the added traceability, more stringent testing requirements, and the 100-percent inspection requirement on shipments for defense, compared with products made for commercial applications. To most respondents this added a sig-

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[2]This finding is consistent with Kelley and Watkins (1995), who found that “the vast majority of defense contractors manufacture military products in the same plants with the same workers and equipment employed in producing items for commercial customers” (p. 531).

nificant amount of paperwork, which they have to absorb in their overhead costs. A few respondents indicated that this affected their price competitiveness for commercial products. But no one could provide a reliable estimate of the added costs resulting from these higher traceability and accountability requirements imposed by the federal government. One respondent estimated that defense paperwork takes 50 percent more time to deal with than commercial paperwork. Another estimated that DoD procurement requirements added 50 percent to the cost of a part relative to the cost of the same part produced for a commercial nonaerospace client.

Implementation in many firms of a computerized production planning system, allowing the itemization of each part order, is helping some of the larger firms to ease this problem. A few firms have dealt with it squarely, passing through the added costs to the government. Two firms, one large and one small, have two price lists for the same product, one for defense clients and one for commercial clients. And one small firm directly charges quality assurance, testing, and inspection costs: “There is no problem with dual production as long one has traceability on each product.”

Other differences that were noted by our respondents were idiosyncratic to their particular products. One firm indicated that its products for defense applications had to be tested at much higher extremes of temperature than commercial products. Another indicated that defense clients required more daily and weekly interaction than commercial clients. And another medium-sized firm indicated that doing business for defense requires it to keep a more capable engineering department; technicians (instead of engineers) would suffice for commercial applications.

BARRIERS TO EXPANSION OF DUAL-USE PRODUCTION

All firms in our sample were already engaged in some form of dual-use production prior to defense downsizing. Hence, production processes and government regulations, while the source of frustration and added costs, did not appear to be the prime barrier to expansion and/or development of their products for commercial applications. For these firms, the primary barriers to dual-use expansion lie elsewhere and differ by type of industry.

Firms that produce exclusively for the aerospace industry, albeit both defense and commercial, are primarily machine shops and aircraft parts firms. As noted in the previous chapter, these firms had great difficulties penetrating the commercial market for nonaerospace applications and were largely unsuccessful even when they tried. In addition to having a cost structure and machines that do not lend themselves easily to more competitive and larger-volume applications, they typically lack knowledge of the commercial market and have no commercial marketing experience. Smaller firms have the added handicap of limited access to capital and of having the responsibilities for overseeing day-to-day operations, development, and marketing concentrated in one person, typically the owner.

These difficulties are reflected in the fact that only three out of the 13 machine shops and aircraft shops in our sample were successful in developing a foothold in the nonaerospace commercial market—making molds for automobile parts, gas turbines for power plants, and a new product for telephones.

Electronics and materials firms were more successful in expanding into the nonaerospace commercial markets for one or both of two reasons: (1) They already had experience with the commercial market; (2) demand for their high-tech products was strong. They also typically had a significant engineering development department. By and large, however, these firms stayed with what they knew best and, with one exception, did not make changes in their production processes. And by 1995, all technology transfer had taken place one way, from defense to commercial applications.