# DEFENSE SPENDING INCREASES AND INFLATION

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## I. INTRODUCTION AND SUMMARY

The Senate Budget Committee asked the Congressional Budget Office to assess the potential inflationary impact of the Administration's planned increase for defense spending, as well as the potential impact of a higher spending path. The Committee expressed particular interest in whether such increases might encounter bottlenecks in specific sectors of the economy.

The CBO review reaches four major conclusions:

1. The macroeconomic effect of both the President's proposal, which provides approximately 5 percent real growth in budget authority over fiscal year 1980, and a higher path providing 10 percent, is quite modest. By the fourth quarter of calendar year 1982 the President's program would increase the Consumer Price Index (CPI) two-tenths of a percentage point over what it would be under current law estimates of the defense budget; the alternative package would result in three-tenths of a percentage point increase in the CPI. Both these results assume that the increase over current law is not offset by spending cuts elsewhere in the federal budget. On the other hand, these results assume no bottleneck problems.

2. It is the procurement of new equipment that is most likely to encounter bottleneck problems. On balance, it is unclear whether the Administration's fiscal year 1981 proposal really provides a more rapid pace of such procurement than the fiscal year 1980 budget (as approved by the Congress). Increases in procurement of tracked combat vehicles are balanced by reductions in aircraft procurement, and by a reduction in the real value of naval shipbuilding. A higher spending program would presumably add to the President's procurement requests, however.

3. If any bottlenecks occur, they are most likely to take place in the aircraft industry, and less likely to occur in those industries supplying tracked vehicles or naval ships. Such bottlenecks would not involve prime contractors, but subcontractors and the supplies of certain raw materials. Whether these bottlenecks actually materialize depends on the actual course of the business cycle. The longer and deeper any recession, the less likely that such bottlenecks will be binding. The

shorter and shallower, the more likely an aircraft production constraint--and resulting price increases--from these sources.

4. Whatever course for defense spending the Congress selects, a steady buildup will minimize bottleneck problems, because it is more likely to encourage capacity expansion. In addition, there are steps that the Department of Defense can take to increase the number of potential bidders on defense contracts, thus further lessening any inflationary pressures that might materialize.

The remainder of this paper analyzes the content of the President's budget request, and the likely content of a higher spending alternative; estimates their macroeconomic effects; reviews the available evidence on possible bottlenecks; and offers concluding observations on ways to minimize any bottleneck problems that might occur.

## II. WHAT HAS THE PRESIDENT REQUESTED? AND WHAT WOULD A HIGHER REQUEST ENTAIL?

There has been considerable variability in the Administration's long-run spending plans for defense. Until recently the Administration had been requesting a defense spending program intended to increase 3 percent per year in real terms, consistent with the joint pledge of the NATO allies to raise their defense budgets by this amount. In December 1979, following Committee hearings on the SALT II treaty and the adequacy of U.S. military forces, the Secretary of Defense announced a program of increased defense budget authority averaging 5 percent per year in real terms for the period fiscal years 1981-1985.

In line with the Secretary's December 1979 statement, the President has requested $158.1 billion in budget authority 1/ for fiscal year 1981 for function 051, "Department of Defense--Military." Under the Administration's January economic assumptions, this would represent 5.4 percent real growth over the fiscal year 1980 request (including anticipated supplementals). Under CBO's March economic assumptions, this represents only 4.7 percent real growth. Over the entire period fiscal years 1981-1985, the

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1/ As reestimated by CBO.

President indicated that he anticipates real increases averaging 4.6 percent per year in budget authority.

The final size of the President's fiscal year 1981 defense budget, and the precise amount of real growth it entails, will depend on supplemental requests and amendments yet to be received by the Congress. In announcing the fiscal year 1981 budget request, the Secretary of Defense stressed that it does not include the full cost of the fuel and other petroleum products that the Department normally consumes. This reflects the rapid rise in the world oil price. The actual size of the shortfall is a matter of considerable dispute, but estimates range between $2 billion and $4.5 billion for fiscal year 1981. A similar problem exists in the fiscal year 1980 budget. One possibility in the current Administration search for anti-inflation initiatives may be a decision to limit the additional amounts requested for this purpose. The amount of real growth actually entailed by the President's request will depend on the outcome of this decision, among others.

As it now stands, the President's budget request does not propose any major changes in force structure. No increase in the number of air wings or Army divisions is planned, although the number of ships in the active fleet will increase by about 10 percent as the Navy takes delivery of earlier orders. Nor is any major increase in the number of military or civilian personnel employed by the Department of Defense (DoD) anticipated. Reflecting these facts, the major real increases in the fiscal year 1981 defense budget request relate to the operation and modernization of existing forces, and for research and development of future weapons systems.

On balance, however, it is unclear whether the Administration's fiscal year 1981 proposal provides a more rapid pace of modernization than the fiscal year 1980 budget now contains (Table 1). While the number of tracked vehicles that the Administration plans to buy is up substantially (principally reflecting procurement of the Army's infantry fighting vehicle), the number of aircraft planned for purchase is down sharply. Although the number of ships for which the Administration is seeking authorization is much larger than in fiscal year 1980, this measure is somewhat misleading. The approved fiscal year 1980 budget contains a nuclear-powered aircraft carrier, which limited the number of other types of vessels that could be procured. The fiscal year 1981 budget request does not contain an aircraft carrier, but expands procurement of other ship types. In real

TABLE 1. MAJOR ELEMENTS OF DEFENSE MODERNIZATION: UNITS OF EQUIPMENT PLANNED FOR PROCUREMENT

| | Quantity in Program for | | |
|---|---|---|---|
| | Fiscal Year 1980 | Fiscal Year 1981 | Change |
| Aircraft | 633 | 466 | -167 |
| Tracked Combat Vehicles | 1,029 | 1,494 | +465 |
| Ships | 12 | 17 | + 5 |

dollar terms, the Navy shipbuilding request is down 16 percent from the fiscal year 1980 approved level and approximately equal to the fiscal year 1979 approved level.

Some critics of the President's budget believe that present plans are inadequate, and that real increases averaging closer to 10 percent per year are required. Like the President, however, these critics do not propose any immediate changes in force structure or manpower levels. Rather, they emphasize increased funding of operating costs and a more rapid rate of modernization than the Administration now plans. In its March 15 report, for example, the House Armed Services Committee proposes adding $7.0 billion for operations and maintenance to the President's request, and $4.5 billion in procurement (principally for aircraft, ships, and missiles). These two areas account for 85 percent of the Committee's recommended changes to the President's 1981 request.

## III. WHAT ARE THE LIKELY MACROECONOMIC EFFECTS OF INCREASED DEFENSE SPENDING, ASSUMING NO BOTTLENECKS?

The macroeconomic impact of the President's proposed defense spending level--as well as higher, alternative programs--depends upon the baseline against which it is compared. We have therefore compared the President's proposal and a higher alternative against a CBO "baseline" estimate of defense spending, a "current law" estimate, and the Senate's earlier fiscal year 1981 budget plan, using the same set of economic assumptions and estimating methodology.

The "current law" spending estimate represents the continuation of the fiscal year 1980 spending level, adjusted for changes in defense programs, but with no discretionary adjustments for price increases. The "baseline" estimate reflects full adjustments for inflation. 2/

While the conference report on the Second Budget Resolution for fiscal year 1980 adopted no outyear spending totals, it did take note of the Senate's fiscal year 1981 budget plan. This is therefore used as a third point of comparison here.

The macroeconomic effect of defense spending decisions also depends upon assumptions about offsetting actions elsewhere in the federal budget. A moderate increase in defense spending would not generate a significant increase in overall demand, and thus in general inflationary pressures, if it were financed by offsetting cuts of approximately equal magnitude elsewhere in the budget. If increased defense spending were financed by an increased deficit, the likely result would be higher inflation, albeit with some delay.

The delay partly reflects the fact that proposals for increased defense spending have been couched in terms of budget authority. While anticipatory business decisions may follow the enactment of budget authority, or its obligation, the effects on overall demand derive principally from orders and outlays--the actual expenditure of funds. Some types of defense budget authority (most notably those for military personnel) result in large immediate outlays (Table 2). Others (especially budget authority for procurement and for military construction) do not result in significant outlays until the year following the budget year.

Table 3 presents the effects on defense outlays of two proposals for increases in defense spending, measured against the three points of comparison discussed above, assuming no offsetting budgetary adjustments. The first package includes the Administration's budget proposal plus an assumed supplemental increase for increased pay and higher fuel costs. The second package assumes the supplemental plus an increase sufficient to achieve a 10

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2/ See Congressional Budget Office, Five-Year Budget Projections: Fiscal Years 1981-1985 (February 1980), Appendix B.

TABLE 2. AVERAGE OUTLAY RATES FOR DEFENSE ACCOUNTS

| Account | Percent Expended In: | | | | |
|---|---|---|---|---|---|
| | Budget Year | 2nd Year | 3rd Year | 4th Year | 5th Year |
| Military Personnel | 97 | 2 | -- | -- | -- |
| Operations & Maintenance | 81 | 14 | 3 | 1 | -- |
| Research & Development | 58 | 33 | 6 | 3 | -- |
| Procurement | 9 | 36 | 27 | 13 | 8 |
| Military Construction | 4 | 41 | 32 | 14 | 6 |

NOTE: Numbers do not add to 100 because of allowance for lapsed appropriations, and because outlays for major procurement and construction projects can extend beyond five years.

TABLE 3. FISCAL YEAR 1981 OUTLAY EFFECTS OF TWO ALTERNATIVE DEFENSE PROGRAMS: IN BILLIONS OF DOLLARS a/

| Increase Over | Package 1 (Administration) | Package 2 (10 Percent Growth) |
|---|---|---|
| Senate Second Resolution | 6.3 | 8.9 |
| CBO "Baseline" | 8.2 | 10.8 |
| "Current Law" | 12.8 | 15.4 |

a/ Both packages include supplementals in fiscal years 1980 and 1981 for pay and fuel.

percent increase in budget authority in fiscal year 1981. The outlay increase in fiscal year 1981 is smaller, reflecting the assumption that the increase is concentrated in procurement and that outlays would build up more gradually.

A rough estimate of the economic impact of the largest measure of the spending increase implied by either package--i.e., the increase over "current law"--is shown in Table 4. As Table 4 indicates, CBO estimates that real GNP would be modestly higher, and the unemployment rate slightly lower, if either defense program were pursued. The effect on the Consumer Price Index (CPI) in 1981 would be quite small, but would rise in 1982. By the fourth quarter of 1982, Package 1 would add two-tenths of a percentage point to the CPI; Package 2 would add three-tenths of a percentage point.

TABLE 4. ESTIMATED ECONOMIC IMPACT OF INCREASED DEFENSE SPENDING

| Economic Variable | Package 1 | Package 2 |
|---|---|---|
| | By the Fourth Quarter of 1981 | |
| GNP (billions of current dollars) | 18 | 27 |
| GNP (billions of 1972 dollars) | 8 | 12 |
| Unemployment rate (percentage points) | -0.2 | -0.3 |
| CPI (percentage points) | Less than 0.1 | Less than 0.1 |

NOTE: By the fourth quarter of 1982, package 1 would add 0.2 to the CPI; package 2, 0.3.

Some analysts expect the impact of higher defense spending on the economy to occur sooner than shown in Table 4. By their reasoning, defense contractors might increase employment or

investment in anticipation of future orders. But even if such effects do occur, they are not likely to be large. At present interest rates this would be a relatively expensive step; therefore, a decision to increase capacity substantially before new orders are in hand would be surprising. As a result, the contemplated increase in defense spending is not likely to have a significant impact on the U.S. economy until late 1981.

## IV. THE MICROECONOMIC EFFECTS OF INCREASED DEFENSE SPENDING: WILL THESE PLANS ENCOUNTER BOTTLENECKS?

The inflationary impact estimated above assumes that DoD confronts no special "bottlenecks" in expending its funds. At the present moment, the manufacturing sector is running at a relatively high rate of capacity utilization (although still below past peaks) (Table 5). 3/ As a result, some observers have asserted that increases in defense procurement would run into specific sectoral constraints, and that increases in procurement budget authority at this time would have a disproportionate effect on inflation. These constraints might appear at the level of the prime contractor, at the subcontractor level, among suppliers of raw materials, or in the supply of skilled manpower. Each of these is considered in turn.

### A. Capacity Limits Among Prime Contractors

Current Administration proposals for the procurement of aircraft, tracked vehicles, and ships do not appear to be limited by facilities constraints on the part of prime contractors.

Except for the F/A-18, aircraft purchase rates planned by the Administration for fiscal years 1981-1985 are generally lower--sometimes substantially lower--than rates sustained in recent years (Table 6). Even taking into account the increased procurement of F/A-18s, the Administration plans to buy significantly fewer aircraft in fiscal year 1981 than are planned for purchase in fiscal year 1980, as was indicated in Table 1.

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3/ Some believe that inflationary effects now begin at lower levels of capacity utilization than in the past, however. See Stephen Brooks, "Supply Constraints and the 1980-1981 Recovery," Data Resources U.S. Review (September 1979), pp. I-10 to I-13.

TABLE 5. CAPACITY UTILIZATION RATES, IN PERCENTAGES

| Year a/ | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All Manufacturing b/ | 85 | 85 | 84 | 80 | 80 | 85 | 85 | 78 | 79 | 81 | 82 | 84 | 82 |
| Non-electrical machinery b/ | 90 | 89 | 91 | 83 | 82 | 86 | 86 | 87 | 81 | 86 | 90 | 92 | 91 |
| Aircraft b/ | 82 | 81 | 75 | 65 | 66 | 70 | 70 | 72 | 64 | 66 | 67 | 72 | 77 |
| Materials c/ | 86 | 87 | 88 | 80 | 81 | 90 | 92 | 81 | 77 | 81 | 83 | 88 | 87 |
| Basic Metal Materials c/ | 84 | 86 | 95 | 81 | 74 | 92 | 97 | 88 | 72 | 81 | 82 | 95 | 90 |

a/ Seasonally adjusted fourth quarter data are used for all years except 1979 when third quarter data are the latest available.

b/ U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business.

c/ Board of Governors of the Federal Reserve System, Statistical Release G.12.3, Industrial Production.

TABLE 6. PROCUREMENT OF SELECTED COMBAT AIRCRAFT, BY FISCAL YEARS

| | Actual | | | Requested | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| A-10 | 144 | 144 | 144 | 60 | 46 | 46 | 46 | 0 |
| F-14 | 44 | 36 | 30 | 24 | 24 | 12 | 6 | 0 |
| F-15 | 97 | 78 | 60 | 30 | 30 | 30 | 0 | 0 |
| F-16 | 105 | 145 | 175 | 180 | 120 | 120 | 120 | 120 |
| F/A-18 | 0 | 9 | 25 | 48 | 96 | 147 | 174 | 191 |

For tracked combat vehicles, the Army is just beginning a major modernization program, so there is no historical record against which to judge Administration plans. They can be evaluated, however, against the capacity levels planned by the prime contractors. In fiscal years 1980 and 1981, production of the XM-1 tank is expected to proceed at rates consistent with Chrysler's capacity, but beginning in fiscal year 1982 will drop significantly below planned capacity. Planned capacity is expected to reach 1,100 tanks per year in fiscal year 1982, rising to 1,560 in fiscal year 1983, and 1,800 in fiscal year 1984 or 1985. In contrast, the Administration now plans to buy 720 XM-1 tanks in fiscal years 1982 and 1983, 802 in fiscal year 1984, and 1,080 in fiscal year 1985.

Procurement of the Infantry Fighting Vehicle (XM-2/3) is planned to increase gradually from the fiscal year 1982 rate of 50 per month to 90 per month in fiscal year 1984, consistent with FMC's capacity. But with additional tooling investment now, capacity could be increased as early as fiscal year 1983. Production could also be expanded by moving from the presently planned work level of two eight-hour shifts a day (five days a week) to three eight-hour shifts (the surge level).

Likewise, there does not appear to be any capacity limit among prime contractors that would restrain contemplated increases in naval shipbuilding. In fact, the U.S. shipbuilding industry is widely viewed as operating well below the capacity of existing facilities, 4/ and both commercial and military shipbuilding plans are not viewed as sufficient to maintain the level of employment enjoyed in the late 1970s. 5/

The shipbuilding picture is somewhat complicated by the fact that only one yard, Newport News, is currently capable of building nuclear-powered surface vessels, and only one other yard is engaged in producing nuclear submarines (Electric Boat). Present Administration plans for building nuclear submarines in fiscal years 1981 and 1982 are believed to be well within present capacity, and modest expansion of Administration plans is probably feasible. For non-nuclear escort vessels, there is no doubt that substantial excess facilities capacity currently exists.

## B. Potential Subcontractor and Raw Material Bottlenecks

While there does not appear to be much concern about the facilities of the prime contractors, there is less confidence that the subcontractors who produce the items that the prime contractors use would be able to respond as readily to increased rates of procurement for military equipment. One piece of evidence cited in this regard is the long lead times that now characterize many items produced by subcontractors, especially items crucial to aircraft production.

These long lead-times reflect the fact that the economy is at the peak of a business cycle. Table 7 provides lead-time data for a series of items used in the manufacture of military hardware. From a comparison of Table 7 with the data in Table 5, it appears

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4/ See, for example, testimony of former Undersecretary of the Navy James Woolsey before the Senate Budget Committe, March 3, 1980; and A.A. Tinajero, "Submarine Shipbuilding Capability and Capacity of U.S. Private Shipyards," Congressional Research Service Report No. 79-111 F, August 7, 1979.

5/ Assistant Secretary of the Navy for Manpower, Reserve Affairs, and Logistics, Naval Ship Procurement Process Study: Final Report (July 1978), pp. 81 ff.

TABLE 7. AVERAGE MANUFACTURING LEAD TIMES FOR MILITARY INPUTS, EXPRESSED IN WEEKS

| | January 1972 | March 1973 | March 1974 | January 1975 | January 1976 | January 1977 | January 1978 | January 1979 | January 1980 |
|---|---|---|---|---|---|---|---|---|---|
| Fourteen raw materials | 13 | 12 | 20 | 25 | 14 | 15 | 12 | 20 | 27 |
| Thirteen castings and forgings | 17 | 18 | 28 | 42 | 30 | 21 | 16 | 19 | 23 |
| Fifteen ship components | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 15 | 17 |

SOURCE: Naval Shipbuilding Scheduling Office (NAVSHIPSO)

that these lead times lag the peak of the business cycle by about a year. 6/ During the most recent expansion, these lead times remained relatively low until late in the business cycle. On this basis, if current macroeconomic policies succeed in cooling off the economy in the second half of 1980, declines in lead times should begin by late 1981. Obligation of fiscal year 1981 budget authority may precede this cyclical change, but only by a matter of months. Thus, by the time the fiscal year 1981 budget is executed, lead times for many critical components may be much less of a problem than now might appear.

In testimony before the Senate Armed Services Committee March 5, 1980, Mr. Dale Church (Deputy Under Secretary of Defense for Acquisition Policy) identified two sectors as particularly likely to constrain the rate of defense procurement: forgings and titanium sponge. The remainder of this section reports the results of interviews that CBO conducted with representatives of industry and labor, as well as independent observers, regarding potential capacity problems in these two sectors.

1. Forgings. Forging compresses cold metal into dies, using vertical force to shape the ingot.

Most observers agree that the capacity problem in forgings involves the large presses used by the aircraft industry. Long lead times in this sector reflect strong demand for new aircraft in the U.S. and abroad, 7/ and Boeing's plans for two new commercial aircraft (the 757 and 767).

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6/ In the last business cycle, GNP peaked in the fourth quarter of 1973 and reached the trough in the first quarter of 1975. Lead times for the items displayed in Table 7 peaked in January 1975 and then fell sharply.

7/ Contributing to domestic commercial demand has been the boom in air travel following deregulation of fares; and the requirement to meet future noise and emissions standards. Moreover, airlines at home and abroad are substituting new, more fuel-efficient aircraft for older models in response to rising fuel prices.

Some decline in foreign purchases of U.S.-made aircraft may occur if there is an increase in the ability of foreign producers to compete with U.S. manufacturers. It is thought

Currently there are four large forging presses--40,000 to 50,000 ton machines--in the United States (two at Alcoa and two at Wyman Gordon), and three foreign presses (in the U.K., France and Germany). The British and German presses already have orders from Boeing and other U.S. companies. All four U.S. presses were built by the government in the 1950s and are owned by the U.S. Air Force. The U.S. government leases these presses to the companies for use in both defense and commercial forgings. A privately owned press (Cameron of Houston, Texas) of the intermediate (30,000 ton) size is also operating at full capacity with orders from aerospace and oil companies.

It is not likely that forging companies will expand large-press capacity on their own initiative. There is an incentive to replace smaller presses for the sake of fuel efficiency and more output per machine, and Webber Metals in California is installing a new intermediate-size press (35,000 tons). But the companies are unlikely to add large presses because of their cost, the long lead time for construction (five years), and because, in their view, a cyclical downturn or a drop in demand for wide bodied commercial jets would mean that a new press would operate at only 10 to 20 percent of capacity without a surge in defense procurement. Given the sizable capital outlay, it has been proposed that the government build a new, even larger press. This proposal is strongly supported by the aerospace companies, but not by the forgers who note that, given their expectations of low capacity utilization, it might be unprofitable even to lease the press from the government under the terms now used for the other large presses. (Obviously, those terms could be changed to make the lease more attractive.)

Given these factors, while forgings currently pose a problem for the aircraft industry, the severity of the problem appears likely to ease significantly over the next year or two. If capacity is anticipated as a problem over the longer run, and if private-sector actions are unlikely to relieve forecast constraints, the federal government could reconsider the question of financing any needed expansion.

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that the introduction of procurement priorities for military aircraft would encourage this development and some U.S. manufacturers and suppliers are therefore reluctant to endorse their use.

Concern has also been expressed, however, about another aspect of the materials base for the aircraft industry--extrusion capacity. The presses used for extrusions force heated metal (primarily aluminum; some titanium) through a die to shape the metal into the desired components. 8/ The process is used primarily for making large structural shapes for aircraft such as landing gear and large wing spars.

There are actually four presses in the United States of the 14,000-ton size capable of producing large extrusions, and one in Japan. All the large U.S. presses are privately owned. 9/ Industry representatives are reluctant to provide information on the cost or time involved in constructing additional presses, or possible plans for expansion, but agree that extrusion capacity is a problem. There are only two presses capable of producing large wing spars and capacity could be seriously strained by C-5 wing modification and CX procurement proposals.

The industry does not favor expanding capacity through government construction and ownership of extrusion presses. Their view conforms to the general opinion of forgers that the government does not belong in the facilities business; they call instead for better planning information from the Defense Department as a basis for planning by industry, and for a shift to multi-year funding of defense programs.

2. Titanium Sponge. Mr. Church's testimony also identified titanium sponge as a principal bottleneck for the aerospace industry. There are only three integrated titanium companies in the United States capable of making the sponge necessary for producing titanium ingot. The non-integrated fabricators that convert titanium ingot into billet, bar, sheet, plate and tubing must purchase sponge from these producers or import it from

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8/ The process can be thought of as similar to squeezing toothpaste out of a tube, with interchangeable caps (dies) in different shapes.

9/ One is at Martin Marietta's California plant, two at Alcoa's Cleveland facility, and one at Consolidated Aluminum in St. Louis. There are also smaller extrusion presses owned by the government. Curtis-Wright leases an Air Force-owned press used for the extrusion of exotic metals and Kaiser operates an Air Force-owned press in Baltimore (Alcoa).

Japan, the other major source of the material. Titanium milled products are used in the production of military airframes and engines, commercial airframes and engines, and by industrial users that require corrosion resistant metals.

The largest U.S. producer of titanium sponge, Timet, imports its raw material--rutile, a 95 percent titanium bearing ore concentrate--from Australia. The process used by this company begins with the chlorination of the ore to produce titanium tetrachloride. Titanium tetrachloride is then purified in several steps and reacted with magnesium to produce a raw, porous titanium metal called sponge.

There is no question that titanium sponge is in short supply worldwide. One of the major U.S. producers argues, however, that the reported shortage of titanium has been caused by titanium consumers attempting to purchase more titanium products than most forecasts of aircraft deliveries indicate is required.

The non-integrated titanium companies and some forgers are supporting a bill (H.R. 3591) to alleviate the problem in the short term by reducing the ad valorem tariff on titanium sponge from 18 to 9 percent. 10/ While this might reduce current prices in the U.S. domestic market, over the longer run it will discourage additions to U.S. sponge capacity, and the integrated companies urge that the bill be tabled on these grounds. 11/

C. Skilled Manpower Constraints

Since the President's budget request does not envisage any significant additions to force structure, no major changes are

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10/ A gradual reduction in the U.S. tariff was negotiated under the Tokyo Round, but there will be no actual reduction until January 1982 (from 18 to 15 percent), and the final reduction (to 12 percent) will be higher than European tariffs.

11/ Lowering the tariff would not change overall U.S. dependence on foreign supplies regarding this key material, but it would change the nature of that dependence. At the moment, the U.S. depends on foreign supplies for the raw material (rutile); lower tariff barriers would, over time, substitute a dependence on foreign manufacturers of sponge.

planned in the level of military or civilian employment by the Department of Defense. Similarly, few if any of the proposals for increasing defense spending beyond the President's budget request have included force structure changes that would enlarge the number of people in uniform, or add significantly to civilians employed directly by DoD. Were the size of the active-duty forces enlarged, however, the Defense Department would be compelled to increase compensation for enlisted personnel beyond currently planned amounts if it wished to maintain present quality levels. 12/

Increased purchases from the civil sector under either the President's proposal or proposals for higher spending would place additional demands on the civilian labor force, however. Given the nature of the President's budget request, and the content of likely alternatives, such additional demands are likely to be concentrated in those sectors supplying research and development services, and those sectors manufacturing equipment for the military.

Although concern has been expressed about the supply of skilled workers for both the aerospace industry and for shipbuilding, perceived shortages partly reflect the current high level of economic activity, and this situation could be quite different by the time fiscal year 1981 budget monies were committed. The skilled manpower constraint that an expansion of defense spending is more likely to encounter is the one for engineers. 13/ This reflects the secular decline that took place in engineering enrollments in the early 1970s (Table 8), responding to a diminution in job opportunities in that period. Engineering enrollments have since turned back up, and a lagged effect can be expected on the supply of engineers in the early 1980s (although part of the increase is accounted for by increased enrollments of non-resident aliens).

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12/ CBO estimates that some of this increase will be needed even at current active-duty strength levels (see Congressional Budget Office, Manning the Active-Duty Military, forthcoming).

13 Some observers believe that part of the current "shortage" of engineers has been caused by firms stockpiling their personnel in anticipation of future orders.

TABLE 8. ENGINEERING ENROLLMENT IN FOUR-YEAR INSTITUTIONS OF HIGHER EDUCATION IN THE UNITED STATES, FALL 1969 to FALL 1976: IN THOUSANDS

| 1965 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|---|---|---|---|
| 309 | 318 | 316 | 289 | 267 | 260 | 275 | 310 | 338 | 371 |

SOURCE: National Center for Education Statistics. No data are available for 1966-68, nor are comparable data available beyond 1977.

There may develop, of course, other skilled labor shortages that are not visible in current data. Certain parts of the U.S. capital stock are going through an unusual replacement phase, responding to the extraordinary recent changes in energy prices, in some cases reinforced by federal requirements designed to accelerate the pace of adjustment (e.g., automobiles). This has created strong demand for certain segments of the machine tool industry, with consequent effects on the demand for tool and die workers.

## V. CONCLUDING OBSERVATIONS

Any bottlenecks that increased defense spending might encounter will depend on the state of the overall economy when the spending takes place (one to two years from now). Moreover, potential bottlenecks depend not only on the size of the increase planned, but on where it is spent. If any bottlenecks develop, they are more likely to involve the aircraft industry than those supplying either tracked combat vehicles or ships to the Department of Defense (for the range of increases being considered).

Even for aircraft, it would be unwise to exaggerate potential bottleneck problems. It is notable that aircraft represent the area where the President actually proposes buying significantly fewer items in fiscal year 1981 than were bought in fiscal year 1980. Together with the expected softening of demand for commercial aircraft, this makes the actual development of aircraft-related bottlenecks less likely than might now appear.

It is also clear that avoiding bottlenecks in the future depends on how the private sector responds to any defense buildup. Because the economy is near the peak of a business cycle, lead times for some subcontractors are quite lengthy. Discussions with industry representatives do not disclose immediate plans for major additions to capacity, which is consistent with the consensus forecast of a business downturn in the near future. Both common sense and discussions with industry representatives suggest that capacity additions are more likely to be made if there is a steady, sustained program of defense spending increases than if defense spending proceeds in fits and starts. In the shipbuilding industry, for example, a gradual buildup permits the yards to fill some of the requirements for skilled workers through their own training programs. Moreover, an erratic trajectory for future spending is also likely to require the Department of Defense to use its authority to set priorities, giving itself an earlier place in the queue, but at the potential expense of the export competitiveness of the industries involved. Should the use of the defense priority system be necessary, a judicious and selective application will help limit any inflationary pressures that would be created for the rest of the economy.

A smooth private sector response to any defense increase is more likely the more numerous the companies qualified to bid on defense contracts. In this regard, recent testimony before the Senate Budget Committee indicates that a number of steps might be taken to lower barriers to entry into the defense marketplace. 14/ These include modifying or eliminating unnecessary specialized requirements associated with defense procurements, especially administrative requirements. Such steps have also been endorsed by the Navy. 15/ While certain aspects of defense procurement are likely to remain relatively concentrated, increasing the number of firms bidding on defense contracts will improve competitiveness, and help minimize bottlenecks that might otherwise occur.

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14/ See statement by Geneese Baumbusch before the Senate Budget Committee, March 3, 1980.

15/ The Naval Ship Procurement Process Study states (p. 88): ". . . the technical requirements and documentation demanded for Navy work so far exceed those required for other business that some vendors simply drop many product lines. . . Navy technical and documentation requirements work to reduce the number of sources, resulting in increased costs, and making ship construction schedules more dependent on the performance of fewer and fewer subcontractors."