

CBO TESTIMONY

Statement of
Cindy Williams
Assistant Director
National Security Division
Congressional Budget Office

on
Modernizing Tactical Aircraft

before the
Subcommittee on Airland Forces
Committee on Armed Services
United States Senate

April 16, 1997

NOTICE

This statement is not available
for public release until it is
delivered at 10:00 a.m. (EDT),
Wednesday, April 16, 1997.



CONGRESSIONAL BUDGET OFFICE
SECOND AND D STREETS, S.W.
WASHINGTON, D.C. 20515

I appreciate the opportunity to appear before you today to discuss the Congressional Budget Office's (CBO's) analysis of tactical aircraft plans for the Department of Defense (DoD). That analysis appeared in a recent CBO study titled *A Look at Tomorrow's Tactical Air Forces*. I will highlight CBO's major findings in my testimony today.

Our analysis suggests that DoD's planned aircraft purchases for fighter fleets will be difficult to afford. CBO projected prices for the three new fighters the department plans to buy: the F-22, the Joint Strike Fighter (JSF), and the F/A-18E/F. The costs of two of those planes—the F-22 and the JSF—are likely to far exceed DoD's current goals. Since CBO released its analysis, DoD has released an estimate of F-22 program costs that sheds further light on the potential for cost growth in the fighter program. That estimate was part of a Congressionally mandated report on the F-22's cost. Prepared by the Office of the Secretary of Defense's Cost Analysis Improvement Group, that report expressed concerns similar to those raised by CBO about the potential for higher prices. I will have more to say about that later in my testimony.

Another problem for DoD will be the aging of its aircraft fleets. Even though current plans call for buying about 4,400 new aircraft between now and 2030, the planned pace of purchases will mean that to prevent shortfalls, the services will have to operate aircraft to unprecedented ages. The average age of aircraft today is about 10 years, reflecting the historical practice of replacing tactical fighter and attack

aircraft as they approach 20 years of service. By 2003, however, the average age for all Air Force tactical aircraft will exceed 15 years, and it will peak at 18 years by 2010. The Department of the Navy's tactical aircraft fleet will also age but to a lesser extent, reaching an average age of 15 years by 2008. Joint Strike Fighters begin to arrive in quantity after 2008, so then the average age of the Navy's fleet begins to decline.

CBO's analysis presents policy alternatives that address the problems of affordability and aging. It lays out specific alternatives that illustrate the hard choices that DoD might have to make if current plans for tactical aviation prove to be unaffordable. After providing background on DoD's plans, my remarks will focus on the issue of affordability and the potential for growth in the cost of fighter aircraft. I will also discuss several alternatives that illustrate approaches to reducing spending.

DoD's PLANS FOR U.S. TACTICAL AIR FORCES

The Air Force, Navy, and Marine Corps all employ fixed-wing fighter and attack aircraft that fight enemy planes in the air and attack targets on the ground. Current plans call for the equivalent of 20 Air Force tactical fighter wings, 11 wings that operate from the Navy's large deck carriers, and four wings of fixed-wing fighter and

attack aircraft for the Marine Corps. To fill out those force levels, DoD needs to retain about 3,500 aircraft in inventory.

The bulk of DoD's current inventory comprises four kinds of fighter and attack aircraft. Most of the Air Force fleet consists of F-16s (a small, relatively inexpensive, multipurpose plane—that is, one that performs both fighter and attack roles) and F-15s (a larger, more capable, more expensive fighter). The major portion of the Navy and Marine Corps inventory consists of F/A-18s, a multipurpose plane. F/A-18s operate both in Navy carrier-based air wings and in fighter squadrons in the Marine Corps. The Marine Corps also operates the AV-8B Harrier, which can take off in short distances and land vertically—the so-called short takeoff vertical landing (STOVL) capability.

DoD's plans for modernization call for replacing all of those planes with three types of aircraft: the F-22, the F/A-18E/F, and the Joint Strike Fighter. DoD expects to acquire 438 F-22 fighters for the Air Force and 1,000 F/A-18E/Fs for the Navy. U.S. purchases of the Joint Strike Fighter—a multipurpose plane being developed for all three services as well as the British Royal Navy—may total 2,978. All three planes are to be more effective than the planes they will replace.

The planes will also be expensive. CBO estimates that the total cost to develop and acquire the roughly 4,400 planes in DoD's 1998 plan amounts to more

than \$350 billion, even without factoring in inflation (see Table 1). That estimate includes total funds for development and procurement. DoD also intends to spend about \$45.9 billion (in 1997 dollars) on the three new aircraft over the 1998-2003 period.

DoD's PLANS WILL BE COSTLY AND DIFFICULT TO AFFORD WITHOUT CHANGING SPENDING PATTERNS

The Administration's plans to modernize are already costly. CBO made two estimates of the cost of fighter aircraft. We based one estimate on the prices for the F-22 and the F/A-18 included in DoD's Selected Acquisition Report reflecting the Administration's 1998 budget plan, a report that DoD presents to the Congress each year on the costs of major weapons. (CBO's estimates represent an update of the numbers in our January report, since we did not receive DoD's new estimates until last week.) That projection also included an estimate of what the Joint Strike Fighter could cost if DoD meets its goals for the price of the fighter. We based the other estimate on historical relationships between the cost of fighter aircraft and such factors as weight and capability. We then looked at the shares of past budgets that DoD has devoted to purchasing fighters to give us a benchmark for the funds that might be available.

TABLE 1. PLANS FOR TACTICAL FIGHTER AND ATTACK AIRCRAFT
IN THE ADMINISTRATION'S 1998 BUDGET

| Aircraft | Aircraft It Will Replace | First Enters the Force in Bulk | Quantity | Budget Authority (Billions of 1997 dollars) | | | | | |
|--------------|---------------------------------|--------------------------------------|--------------|--|--------------------|--------------|--------------------------------|------------------|--------------|
| | | | | Administration's Estimate | | | CBO's Estimate ^a | | |
| | | | | RDT&E | Procure- ment | Total | RDT&E | Procure- ment | Total |
| F-22 | F-15A-D | 2003-2010 | 438 | 23.8 | 38.7 | 62.5 | 23.8 | 48.1 | 71.9 |
| F/A-18E/F | F/A-18A-D | 2000-2005 | 1,000 | 5.7 | 56.7 | 62.4 | 5.7 | 62.2 | 67.9 |
| JSF | A-10, F-16, F/A-18, AV-8B | Early 2010s | 2,978 | 20.0 | 144.8 ^b | 164.5 | 21.5 | 197.3 | 218.8 |
| Total | | | 4,416 | 49.5 | 240.2 | 289.7 | 51.0 | 307.6 | 358.6 |

SOURCE: Congressional Budget Office.

NOTE: RDT&E = research, development, test, and evaluation; JSF = Joint Strike Fighter.

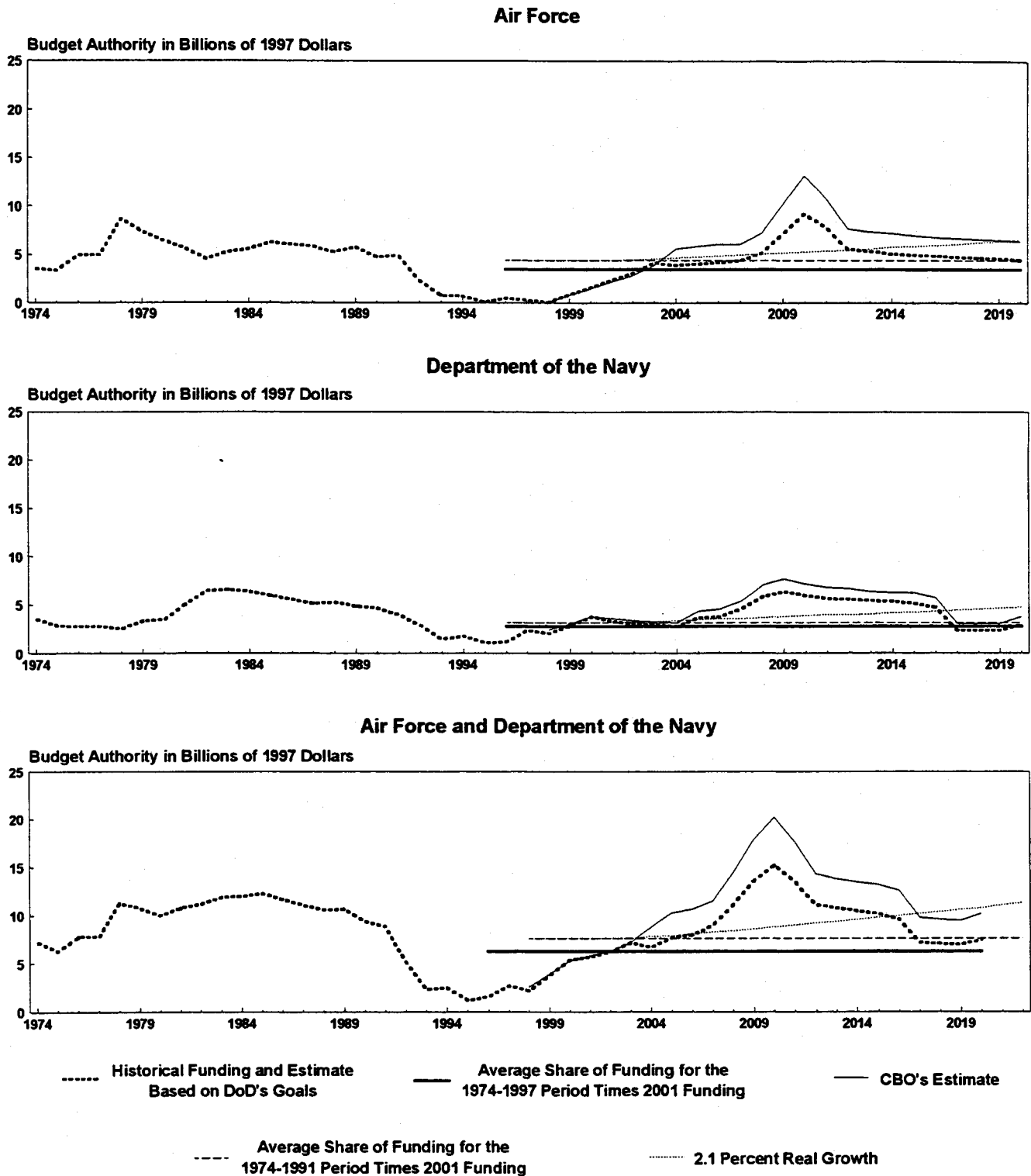
- a. These estimates differ from the estimates in CBO's January 1997 study, which reflect the 1997 plan.
- b. This estimate is based on the Department of Defense's goals for the price of the JSF. (The DoD estimate was expressed as a unit flyaway cost, which excludes funding for initial spares and support equipment.)

In its 1998 request, DoD asked for \$2.2 billion to purchase advanced fighters and about \$3.1 billion to develop them. The budget request also includes \$159 million to buy three F-15Es and \$133 million for their development. Procurement funding for new fighters is scheduled to rise to about \$6 billion by 2003 in DoD's 1998 Future Years Defense Program, and even larger sums would be needed in the longer term. CBO projects that spending to purchase the fighter and attack aircraft in DoD's plans will average \$9.4 billion annually over the 2002-2020 period, even under the lower estimate of fighter prices. At that lower estimate, DoD would need more than \$15 billion in 2010, when it plans to purchase a total of more than 260 of the three types of planes (see Figure 1).

If DoD's estimates of procurement costs prove too optimistic, as CBO's analysis indicates, spending needs could be even greater. DoD would need to spend at least \$14 billion annually to buy fighters for five of the years when purchases for the different programs overlap, and more than \$20 billion in 2010 when all planes are to be bought in large quantities. Annual funding needs for the 2002-2020 period under this higher estimate would average \$12.4 billion.

Even the most modest of those estimates suggest that without real growth in budgets, DoD would need to devote much more funding to fighters in the future than it has in the past. On average, the Air Force and the Navy spent about 4.6 percent and 3.6 percent, respectively, of their annual budgets for 1974 through 1997 to

Figure 1.
Historical and Projected Funding for Fighter and Attack Aircraft (By fiscal year)



SOURCE: Congressional Budget Office.

purchase fighter aircraft. In its January study, CBO applied those percentages to the service budgets for 2001 contained in the Administration's 1997 plan (2001 was the last year for which plans were available when the study was performed). According to that estimate, the services might have a total of about \$6.3 billion to spend for fighter aircraft each year if they follow past patterns in spending and if their budgets remain level after 2001. CBO's estimates of future funding requirements are 50 percent to about 95 percent higher than that amount.

Meeting the funding requirements in the years when purchases of fighter aircraft overlap would be even more difficult. The peak funding for new purchases during the historical period for which we have data—namely, 1974 through 1997—totaled \$12.3 billion, about \$3 billion to \$8 billion short of the funds DoD might need for peak funding in the future. Those previous peaks also occurred during the mid-1980s, when defense budgets were at peacetime highs. For example, in 1985, when funding for fighters reached \$12.3 billion, DoD had a budget that represented purchasing power of more than \$400 billion in today's dollars.

Current plans suggest that DoD might need to spend a much larger share of future procurement budgets on tactical fighters than it has at least since 1974. That share peaked at 16.6 percent in 1978 and 1979. DoD assumes that the procurement budget will grow to about \$61 billion (in 1997 dollars) by 2002, although such increases have eluded the department's grasp in the past three budget submissions.

If DoD achieves that goal and keeps funding at that value through the end of that decade, it needs to devote an unprecedented 36 percent of procurement funding to fighters in 2010 if it cannot hold down fighter prices.

Without real growth in future defense budgets, the share for fighters could realize such increases only at the expense of other weapons. Yet the same pressures that lead the Defense Department to wish to increase procurement levels of fighters after the post-Cold War procurement holiday are likely to be felt for other types of weapons as well. For example, the Navy expects to purchase about twice as many ships on average during the 2002-2020 period as during the 1997-2001 period. Furthermore, the Army plans to modernize its helicopter fleet extensively. Also, any increases to fund long-range bombers or additional airlift aircraft could come at the expense of funds for fighter planes.

Although some missions, such as antisubmarine warfare, have been de-emphasized since the end of the Cold War, other missions, such as mobility, have escalated in importance. National and theater-level missile defenses could also be strong contenders for defense funds.

This year's budget suggests that DoD may already be having difficulties in increasing its purchases of new aircraft. Both the F-22 and F/A-18E/F programs have experienced stretchouts. Those two programs, along with the Joint Strike

Fighter, have become the focus of Congressional scrutiny, at least in part because of concerns about the overall affordability of tactical aircraft. Last year the Congress directed the Office of the Secretary of Defense's Cost Analysis Improvement Group to conduct an independent review of the F-22's costs. It also directed studies of the costs and benefits of both the F/A-18E/F and the Joint Strike Fighter. I would like to focus on the F-22's costs.

Cost Growth in the F-22 Program

Last year the Air Force conducted an internal study of the schedule and costs of the F-22 program. It reported the results of its analysis, which was conducted by a Joint Cost Estimating Team (JET) made up of both service and contractor personnel, to the Congress in a letter last December. The JET estimated that total development funding for the plane (including funds already committed since the beginning of the program) would increase to \$22.4 billion from \$21.2 billion. (The funds in the discussion of cost growth in the F-22 program are expressed in current dollars to be consistent with the numbers used by DoD. Costs discussed in the remainder of this testimony are expressed in 1997 dollars.) The Air Force decided to offset the increase in development costs by transferring funds from procurement to development and by eliminating some of the test vehicles.

Production funding in current dollars, the team reported, could increase to \$61.2 billion from last year's estimate of \$48.7 billion. Thus the F-22's costs would rise to about \$83.6 billion in current dollars—about \$13.7 billion more than the amount the Air Force estimated it needed in 1997 (see Table 2). But the service/contractor team also estimated that the increase in production costs could be offset by instituting an ambitious set of initiatives aimed at controlling costs.

Two weeks ago, the Office of the Secretary of Defense provided the review of the F-22's costs that its Cost Analysis Improvement Group (CAIG) had conducted. The CAIG's estimate of development costs was almost the same as the JET's estimate.

Both the CAIG and CBO had somewhat higher estimates for production costs than the JET. (The CAIG report suggests that the JET made several different assumptions about program composition and projected inflation. The net effect of conforming the JET's estimate to the CAIG's assumptions would lower its value by about \$2.2 billion, to about \$58.8 billion, according to the CAIG.) The CAIG estimated that producing 438 planes on the slower schedule now planned by the Air Force would cost about \$64.4 billion (also in current dollars). Earlier this year, CBO estimated that production could cost \$63.1 billion in current dollars (about \$47 billion in 1997 dollars) using models that are based on past relationships between price and measures such as weight and performance. Incorporating the slower

TABLE 2. COST ESTIMATES FOR THE F-22 (In billions of current dollars)

| Source of Estimate | Appropriation | | Total |
|---|--------------------|-------------------|-------|
| | RDT&E ^a | Procurement | |
| DoD's 1997 Estimate ^b | 21.2 | 48.7 | 69.9 |
| Air Force Joint Cost Estimating Team (Excludes initiative savings) | 22.4 | 61.2 ^c | 83.6 |
| Current Air Force Estimate (Includes initiative savings) ^d | 22.4 | 48.3 | 70.7 |
| OSD Cost Analysis Improvement Group | 22.5 | 64.4 | 86.9 |
| CBO Estimate | | | |
| In current dollars ^e | 22.5 | 65.7 | 88.2 |
| In 1997 dollars ^f | 23.8 | 48.0 | 71.8 |

SOURCE: Congressional Budget Office.

NOTES: Estimates exclude military construction costs, which are not significant.

RDT&E = research, development, test, and evaluation; OSD = Office of the Secretary of Defense.

- a. All estimates include \$3.7 billion in costs incurred from 1983 to 1991 for predevelopment and the demonstration/validation program.
- b. Source is Department of Defense, December 31, 1995, F-22 Selected Acquisition Report.
- c. Conforming the estimate by the Joint Cost Estimating Team to the assumptions of the Cost Analysis Improvement Group would reduce it to \$58.8 billion.
- d. Source is Department of Defense, December 31, 1996, F-22 Selected Acquisition Report.
- e. Based on CBO's inflation assumptions. If CBO used OSD's inflation assumptions, the procurement estimate would be \$62 billion, about 4 percent less than the Cost Analysis Improvement Group's estimate.
- f. These costs are somewhat higher than those published in CBO's January 1997 study because they reflect the Air Force's decision to lengthen the development phase and slow the production phase.

schedule, CBO now estimates that production costs would total \$65.7 billion (in current dollars), about 2 percent more than the CAIG's estimate. But DoD's assumptions about inflation are lower than CBO's. Using DoD's assumptions lowers CBO's estimate to \$62 billion, about 4 percent less than the CAIG's estimate.

Although the CBO, CAIG, and JET estimates differ by billions of dollars, they all are at least 20 percent higher than the numbers in DoD's plans. The Air Force and the F-22's contractors claim that most or all of the added production costs can be offset by undertaking initiatives that will control costs and by restructuring the F-22 program. The Secretary of Defense endorsed that approach in his letter of April 2, 1997, which accompanied the CAIG estimate. Table 3 provides a selected list of the initiatives the Air Force or the contractors are proposing to keep F-22 prices down.

The Air Force has high confidence that the initiatives can save \$12.2 billion and that "most probable savings" (estimates the service believes include more risk but might still be attainable) would further reduce costs by \$3.1 billion. The CAIG report provides an evaluation of the initiatives proposed by the JET. Most of the savings are assumed to come from enhancing the efficiency of production (\$5.3 billion) and reforming acquisition practices (\$3.4 billion). The initiatives also include savings from not purchasing the equipment to maintain the plane at service

TABLE 3. THE AIR FORCE'S PROPOSED COST-SAVING INITIATIVES

| Initiative | Air Force Estimate of Savings (Billions of current dollars of budget authority) | Evaluation |
|---|--|---|
| Production Efficiencies | | |
| Producibility improvements | 3.9 | Program estimate already accounts for many producibility initiatives. May double-count cost reductions from "learning" assumptions. |
| Diminishing manufacturing sources | 1.4 | May double-count savings from "learning" assumptions or multiyear production. |
| Acquisition Reform | | |
| Lean production actions | 2.0 | May double-count savings from earlier acquisition reform. |
| Lean manufacturing | 0.5 | May double-count savings from earlier acquisition reform. |
| Material efficiencies | 0.5 | May double-count savings from "learning" assumptions and multiyear production. |
| Performance-based contracting | 0.4 | May double-count savings from earlier acquisition reform. |
| Product Support (Contract logistics support and warranty) | 3.0 | Decreases reliance on service depots. Some of the estimate may represent a transfer of funds to operating accounts. |
| Multiyear Production | 2.9 | Savings possible but require program stability. Some savings may be double-counted in items above. |
| Other ^a | 0.7 | If the Joint Strike Fighter program is delayed, some savings might not be realized. |
| Total | 15.3 | |

SOURCE: Congressional Budget Office evaluation of information and estimates from the Office of the Secretary of Defense and the Air Force.

a. Includes savings for the F-22 that could occur when the Joint Strike Fighter enters production. Since the Joint Strike Fighter could be produced at the same plants as the F-22, overhead costs might be shared, thus reducing the amount the F-22 program would have to pay.

depots (\$3.0 billion) and from contracting for purchasing aircraft for several years, so-called multiyear production (\$2.9 billion).

Although the Air Force and the contractors claim that those initiatives have been studied in enough detail to know that they do not represent efficiencies that have already been incorporated in the baseline estimates, some of them may double-count savings already implicit in the F-22's baseline. Under Secretary of Defense Paul Kaminski testified earlier this year that affordability initiatives for the F-22 date back to the mid-1980s. He also suggested that the program "from its inception has led the way in implementing Lean Enterprise initiatives"—a family of acquisition reforms aimed at reducing costs. Why the new initiatives had not already been incorporated in the structure of such an innovative program is not clear.

The CAIG report raised an additional concern about possible double-counting. All estimates for the costs of weapons include assumptions about savings from "learning," the increased efficiency that occurs when successive units are produced. That term can be confusing, since those efficiencies derive only in part from workers learning how to do their jobs better. According to in-depth studies that RAND and other analytic organizations have conducted on the relationships between costs and quantity in the aircraft industry, savings also come from improving production methods and management, eliminating engineering problems, simplifying

the design, and making parts easier to produce. As a result of those actions, prices decline.

If graphed, this phenomenon results in a downward-sloping curve called a "learning curve." Cost estimates for weapons programs reflect such a curve based on a number of assumptions including past price patterns. Savings reflected in the initiatives, such as the production efficiencies or even acquisition reforms, might already be implicitly assumed under the learning curve that is incorporated in the baseline estimate, even if the specific idea is not explicitly included.

One might also question whether other initiatives seem likely to reap benefits or whether their savings will be offset by other factors. An example of that concern is the assumption that \$2.9 billion could be saved by writing a multiyear contract to keep program quantities and the plane's configuration stable so as to permit contractors to plan better and thus order more efficiently. Fighter production programs rarely have a stable configuration from early production lots through the entire production run, however, and model changes are probably much more likely to increase program costs.

The agreement between the JET's top-line estimate, the CAIG's estimate, and CBO's estimate may give one pause. Each of those estimates, shown in Table 2, was derived using methods that are widely accepted by cost estimators. Yet each estimate

is based on independent methods. For example, the JET and the CAIG estimated costs at a subsystem level, and CBO estimated costs at the major component level. Also, the JET and the CAIG used data about the prices of the first F-22 being built that were unavailable to CBO. Notwithstanding those differences, all three groups came up with similar amounts, which suggests that the estimates are robust.

Taken together, those concerns suggest that DoD will find it difficult to realize all the savings in the proposed initiatives. The CAIG report states that the savings from the initiatives are too uncertain to be reflected in its estimate. CBO agrees that there appears to be substantial risk that savings from those initiatives will not be realized, though we also recognize that aggressive cost goals may help keep pressure on the contractors to hold down actual costs.

Such a strategy of optimistic pricing has disadvantages, however, particularly if it is applied to many weapons programs at the same time. Such optimistic estimates may lull DoD into imagining that it will be able to purchase more weapons than can actually be bought with constrained budgets. Thus, DoD may develop more weapons than it can purchase at economic rates, wasting scarce defense dollars when it has to cancel weapons or purchase them in small, inefficient quantities. Compared with the Administration's goals, CBO's analysis suggests that higher prices are likely both for the F-22 and the Joint Strike Fighter. If higher prices materialize and future budgets do not grow significantly, DoD would need to devote an unprecedented

share of its future budgets to funding fighter programs. Given those trends, DoD may face choices that become increasingly difficult in the not-too-distant future.

Indeed, such choices may already be apparent in the restructuring of the near-term F-22 program. Last year, the Air Force planned to buy 124 F-22s over the 1998-2003 period. Although this year's plan would buy only 70 during the same period—a reduction of more than 40 percent from the previous year—funding for those years remained almost the same, at about \$20.4 billion now compared with \$21.5 billion in last year's estimate. That is a savings of about \$1.1 billion, only about 5 percent of the estimate in last year's budget for total funding for the period, despite buying 54 fewer planes.

Finally, the phasing of the savings that the Air Force expects to achieve from its initiatives for the F-22 is also a major concern. Because each of the early production lots is to be purchased under a separate fixed-price contract, the actual savings will not be known until the sixth production lot, more than seven years from now and after the plane has been in production for six years. Since weapons acquisition programs take on considerable momentum during production, waiting that long to determine whether the estimates will pan out may foreclose a number of options for future Administrations and the Congress.

The Joint Strike Fighter

The price of the F-22 is an important aspect of the Administration's plans. Yet the success of those plans depends in even greater measure on DoD's ability to produce a Joint Strike Fighter that departs from past development and production patterns for fighter aircraft. And the Administration's goals for the price of the JSF are less in line with past patterns than its goals for the F-22. One of the greatest departures from past practices is the number of missions that the JSF family of aircraft is expected to undertake. The plane is supposed to perform virtually every mission that fighter aircraft perform in the force structure today and, moreover, to do so with a family of planes that have nearly 80 percent of their parts in common.

Joint Strike Fighters are to be fielded in Air Force, Navy, and Marine Corps inventories. Partly as a result of that high level of cross-service operation, commonality, and the use of commercial practices (such as relief from meeting government standards), DoD expects the JSF program to break the spiraling of prices for fighter aircraft that has been going on for at least 40 years.

The question is whether the Joint Strike Fighter will be able to meet those ambitious goals, a number of which may be incompatible. For example, its price must be kept relatively low to meet the Air Force's need to purchase planes in large quantity. But the Navy's desire for a very stealthy aircraft that can operate over fairly

long ranges could drive up the price. Also, the STOVL planes that can operate from the amphibious ships that transport Marines to war typically pay for that capability by being less capable in other ways.

Such incompatibility of goals may lead the services to make compromises if the JSF program is to retain its joint-service characteristics. The services may be willing to accept operational trade-offs. But many past DoD programs have started out assuming a high level of joint participation among the services that later dissipated or never materialized.

Some critics also worry that the JSF is the most complex development program to be managed under DoD's new guidelines for acquisition. Those new rules permit programs to skip many traditional DoD reviews. Such reviews take time and often add to the cost and complexity of a program, but they also may lessen the likelihood that DoD will spend too much time (and money) on a beleaguered program.

The Defense Department's expectation of holding down the price of the Joint Strike Fighter would represent a significant break with past patterns. If the plane's costs reflected previous trends in prices, total procurement costs could be about \$197 billion—roughly 36 percent higher than DoD might estimate.

F/A-18E/F

The only fighter in the Administration's program whose price CBO did not dispute in its January 1997 study is the F/A-18E/F. CBO's analysis suggested that the fighter's price reflected historical relationships between performance and costs. This year, the Navy revealed a new plan for the fighter. It slowed near-term purchases and decreased maximum production rates from 72 planes per year to 60 planes. The Navy also has a new production estimate for the program that is about 5 percent lower than last year's estimate. According to DoD, the CAIG's estimate of the cost of this plan for the F/A-18E/F program also agrees with the estimate in the budget.

Some of the decrease from last year's prices relates to lower production costs. But the Navy transferred about \$3 billion of funding for initial spares, which it still needs to buy, to another part of the budget to offset the plane's higher nonrecurring/ancillary equipment costs. CBO's estimate of the 1998 plan—now about \$62.2 billion, roughly 10 percent higher than the Navy's estimate—does not account for that transfer. Adjusting the Navy's estimate to include the transfer brings it within 4 percent of CBO's estimate.

Even though the Navy estimates that the F/A-18E/F's price has dropped, as noted above, purchases of the fighter have been stretched. This year, the Navy plans

to buy a total of 10 fewer F/A-18E/Fs in 1998 and 1999 than it expected to last year, apparently because it lacks the money to pay for them.

I have suggested that affording all of the planes in DoD's plans would be difficult. Such budget-related slips in schedules as that experienced by the F/A-18E/F may result from trying to pack more into the budget than will fit. Such slips and rate cuts may be even more likely in the future when funding shortfalls will probably be much greater.

The Committee is now reviewing the results of a study performed by DoD that evaluates the need to develop the F/A-18E/F and the benefits of purchasing the fighter in contrast to continuing to buy the F/A-18C/D. In an evaluation of alternatives the Congress might wish to consider to rein in future costs, CBO included an option that would cancel the F/A-18E/F and continue purchasing the F/A-18C/D. That option, along with a number of others, is discussed below.

WHAT OTHER OPTIONS MIGHT BE CONSIDERED FOR MODERNIZING TACTICAL AIRCRAFT?

Since the Administration's plan may lead to funding shortfalls, the Congress and the Department of Defense may wish to consider alternatives. CBO evaluated four

strategies that DoD might pursue if less money is available for purchasing tactical fighters than current plans require. All four strategies are described in detail in CBO's January study.

Set Priorities for Development

As one strategy for limiting total costs, the Congress might wish to set priorities for modernization. Some critics of the size of DoD's air forces have argued that considerable duplication of effort exists in tactical aviation among the services. The Congress could direct DoD to modernize and retain only the highest-priority forces. That could mean supporting one service's modernization goals at the expense of the others.

Because Air Force fighters are to be purchased in the largest quantities, one approach would be to modernize the Air Force fleet. That option assumes that DoD would go forward with the E/F model of the F/A-18 as well as the F-22s in the quantities currently specified in the Administration's plans. But the Joint Strike Fighter program would revert to an Air Force-only program, eliminating development of a stealthy Navy strike fighter and a Marine Corps advanced STOVL aircraft to replace the AV-8B. Such a plan would save an average of about \$2.5 billion each year compared with CBO's estimate of the costs of the Administration's plan. Even

so, the option is still expensive, requiring roughly 50 percent more funding than the historical share of the budget devoted to purchasing fighters. A contrasting option, also explored in detail in our report, would modernize the Navy and Marine Corps fleets but not that of the Air Force.

Build on Existing Development Efforts

CBO considered two alternatives that would capitalize on systems that already exist or are in development. DoD could adapt existing aircraft to the missions that the Joint Strike Fighter is meant to serve. For instance, the Navy could develop and purchase a version of the Air Force's F-22 that could operate on aircraft carriers to replace F-14s and older F/A-18s. Or it could adapt the stealthy F-117 tactical bomber to serve as its medium-attack aircraft. F/A-18E/Fs could be bought to fill out the Air Force's fighter requirements just as the Navy-developed F-4 was once the backbone of the Air Force fleet. Although such options would cost less than the Administration's plan, they would still be expensive and would result in spending that exceeds historical norms.

Purchase Aircraft That Are Now in Production

One way to keep force size up and avoid substantial aging of the fleet while holding funding down would be to continue purchasing aircraft that are already in production and cancel or defer the development programs. That could mean canceling the F/A-18E/F and delaying the F-22 and JSF programs. To meet force structure requirements, the Department of the Navy would purchase F/A-18C/D and AV-8B aircraft for the Navy and Marine Corps, and the Air Force would buy the latest models of the F-16 and F-15E.

Keeping the current generation of planes in production and deferring modernization may be acceptable to those policymakers who do not expect potential adversaries to undertake extensive modernization for several decades. In the near term, that approach would slow the aging of the fleet compared with the Administration's plan. Although the forces purchased under that strategy would be less advanced than the forces the Administration is developing, they would still represent considerable improvements in capability over the aircraft they replace. Although it would save up to \$4 billion a year compared with DoD's plan, however, this strategy would still bring total funding for fighter aircraft to levels up to 30 percent higher than its historical share of the defense budget.

Make Proportional Cuts to All Programs and Accept Force Cuts

To illustrate in the starkest terms the trade-off that decisionmakers face, CBO also considered an alternative that would focus on modernization at the expense of force structure. That alternative continues all currently planned modernization programs while limiting spending to \$6.3 billion a year, the level of funding consistent with fighters' historical shares of the budget. Reductions to meet the spending target were applied to each program in proportion to its share of total spending. The philosophy behind such an option might be that it is more important to pursue technological challenges in the near and medium term than it is to preserve force size. Such an option might also illustrate the force structure that DoD might end up with if it receives no more money and yet is unable to choose among conflicting budget priorities.

As an outcome of that approach, the force structure of the Air Force would be cut almost in half, and the Navy's force structure would be reduced by roughly 40 percent. Furthermore, the option would fail to keep up the pace of modernization. By 2020, the Air Force fighter fleet would average 19 years of age, even older than the already unprecedented ages under the Administration's plan. Navy inventories would average 14 years of age in 2020, compared with 11 years under the Administration's plan.

CONCLUSION

To summarize, CBO's analysis suggests that DoD's current plans for purchasing fighter aircraft pose a number of problems. Unless defense budgets increase in the future, DoD's plans may not be affordable and may need to be scaled back in some way, even if the prices of fighters do not rise. Yet for two of the three new fighter programs in the plans, most of the evidence suggests that price increases—perhaps substantial ones—are quite likely. Recent program stretchouts may signal what happens when DoD's funding requirements exceed likely budgets. Our analysis also suggests that trends in the aging of the fleet may mean that decisionmakers will have less flexibility in addressing problems in the future.

CBO's analysis therefore illustrates a number of ways of scaling back purchases of fighter and attack aircraft to make them more affordable or to prevent them from crowding out other portions of future defense budgets. But most of those alternatives involve choosing among the programs that the Administration proposes and may therefore be difficult to pursue. Nevertheless, our analysis suggests that the outcome of deferring decisions may be the least attractive choice: it could result in a round of significant force reductions.

