

justify a large initial investment in research, development and procurement. As an example, the Defense Department is considering new types of transport aircraft for use in the combat theater beginning in the mid-1970s. These aircraft will be expensive to develop, but they promise improved performance and lower operating costs. In our analyses, we have sought to construct several alternative tactical airlift force structures, each of which will provide the same capability to move troops, equipment and supplies from selected types of origins to selected types of destinations over the next 15 years. The objective is to see whether a new aircraft will reduce the costs of providing the designated capability enough to repay the investment in development and procurement at a reasonable rate of return.

The following table summarizes the costs of different forces designed to meet one particular set of lift requirements over the next 15 years. For purposes of this comparison, year by year procurement and operating costs were computed, and an interest charge of 10% compounded annually was added. Separately shown are estimated research, development, test and evaluation costs, also calculated on a year by year basis with allowance for interest at 10%. During the development phase of the new aircraft, existing aircraft must be kept in the force. They are replaced only when the new models become available.

15-YEAR COSTS WITH INTEREST AT 10 PERCENT

[In billions]

	No new aircraft	With new aircraft A	With new aircraft B	With new aircraft C
Procurement and operating.....	\$13.3	\$11.8	\$12.4	\$12.2
Research, development, test, and evaluation.....		1.8	0.9	1.9
Total.....	13.3	13.6	13.3	14.2

This table shows that all three new aircraft will enable us to reduce the total cost of buying and operating the forces required for the job. Only with aircraft B can we completely write off the development bill at 10% over a 15 year period. However, there are very great uncertainties about the cost estimates as well as about the technical risks. What this analysis is designed to do is to encourage the proponents of new aircraft types to design them so that they are profitable as possible an investment for the Defense Department without sacrificing the ability to meet basic mission requirements. The best time to encourage this type of work is in the very early stages of an analysis when the alternatives are being designed. Had no interest charges been assessed, the new aircraft would, of course, have been much more attractive, and much less effort would be put into economical design.

5. The supersonic transport program

The Department of Defense has in the past participated in economic analyses of the Supersonic Transport Program and has a continuing responsibility to review the program for potential military uses. The following tables shows the potential profitability of the SST program purely as a financial investment: the present value of total program costs to the government is subtracted from the present value of the return flow of funds from the manufacturer. No attempt is made to pass on the merits of the non-financial aspects of the program. All SST costs prior to FY 69 are considered "sunk", and the calculations assume a fresh decision can be made on whether to continue the program.

PRESENT VALUE OF SET INVESTMENT

[In millions]

	Discount rate		
	5 percent	10 percent	15 percent
SST market as calculated by Institute for Defense Analyses (IDA).....	-\$344	-\$528	-\$579
SST market as calculated by Federal Aviation Administration (FAA).....	218	-239	-421