

## SUMMARY

Congress must vote funding for--and sometimes choose among--an extremely complex assortment of highly technical proposals for supporting the defense technology base. Any type of systematic approach that could make this task more tractable, rational, and transparent would be attractive. One approach that seems, at first examination, to hold much promise is some sort of "decision-support system" or, as it is sometimes called, "risk analysis" often used by commercial research groups. Closer examination reveals that such approaches are too limited in scope to apply across the whole range of projects that Congress must consider, although the approach can still be applied to specific cases.

One limitation of using a decision-support system is that the method requires a quantitative measure of "benefit," which is very difficult to produce when dealing with questions of national security. This is not to say that members of Congress do not have clear ideas of national security objectives, just that these ideas typically are not readily quantifiable.

Much of the reward of a quantitative decision-support system could be had without the artificiality and implied precision of quantitative measures if the Congress could apply its judgment to questions of military research. Congress, however, has judgments about military missions but research money is allocated by technology area and there is no easy uniform way to connect the two. What Congress requires is a clear statement of defense policy, either from the Department of Defense or formulated by Congress, and a "road map" that allows Congress to trace how research proposals intend to support that policy. Congress can require that the Department of Defense demonstrate how the forces that it wants for the future will support the military policy and, finally, how its research programs will make those forces possible. Congress should be able to review those goals that the DoD develops. It does little good for Congress to make certain that research is supporting defense goals if Congress does not support the defense goals themselves.

The criteria for evaluating and correcting research programs include:

- (1) the length of lead time before the technology will produce results,
- (2) likelihood of technical success,
- (3) number and importance of the technology's military applications,
- (4) the time required to develop countering technologies or tactics,
- (5) number and difficulty of required ancillary technologies,
- (6) the risk of being overtaken by parallel technical developments,
- (7) the extent of civilian spin-off (or unintended civilian costs),
- (8) alternatives to U.S. government support including industry and allies, and
- (9) the overall threat posed by potential adversaries.

Congress also has a role in assuring a robust research program and in assuring that research programs are well run. For example, it could designate some fixed percentage of procurement funds to research budgets or designate some floor for research to forestall raids on the research budget. Occasionally, Congress may want to specify funds for particular research areas. An important objective of Congress's oversight is to discover problems as early as possible. Even if Congress is itself not well-suited to detect problems, it can require that procedures be followed which will help assure earliest possible warning of any problems that do occur.

In short, setting military research priorities will never be easy. The task has three parts. One is setting strategic goals. The second is judging which particular research programs will best help reach those goals. Once a research program is approved, there is the separate task of monitoring it to see that it is well run. Congress is best at the first and third tasks but less capable of determining the structure of research programs. Through mechanisms such as hearing, reports, and oversight, Congress can satisfy itself that DoD is selecting and managing research programs on a rational basis.