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COMPTROLLER GENERAL OF THE UNITED STATES
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[Comments on Proposed Study of "Technology Policy and the United States Economy"]

Dr. Robert C. Holland, President
Committee for Economic Development DLG 00429
1700 K Street, N.W.
Washington, D.C. 20006

Dear Dr. Holland:

We appreciate the opportunity to offer comments on CED's proposed study of "Technology Policy and the United States Economy." Our comments are based on the project proposal you gave me at lunch on November 7, 1978.

We believe this proposed study is both relevant and timely. It should complement the Administration's Domestic Policy Review on Industrial Innovation. For the CED study to be most effective, we believe that it must present an independent view. To this end, the analyses and recommendations formulated by CED should be developed by experts other than the authors and consultants involved in the Administration's study. This should not preclude the sharing of substantive data and evidence which form the basis for analysis and support of conclusions reached.

It is generally recognized that the combination of capital investment and technology development is one of the major contributing forces for productivity growth in the U.S. economy. As recent experience demonstrates, it is not surprising to find that reduced commitments of capital investment for the acquisition of technology have been accompanied by reduced productivity growth rates. However, little is known about the exact causal links and mechanisms by which technology policy influences the coupling of technology with capital and support productivity growth. Moreover, knowledge about the effects of social, economic and international trade factors on the coupling mechanism is equally weak. Many studies and published papers have addressed the impact of Federal tax policies and regulations on private R&D investment. Other studies have addressed the uncertainties that currently exist in the domestic and foreign economic environment. These uncertainties have been cited as major deterrents to high risk R&D investment. These uncertainties in the economic environment appear to foster management

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reluctance to incur the risks of major investments required to move from the R&D-proven phase into the launching of new products or the building of new production facilities.

The importance of technology to our economy has been brought out by a study of company economic growth during the period from 1950 to 1974. The study indicated that when high and low technology industries are compared, high technology firms have twice the productivity rate, three times the growth rate, nine times the employment growth, and one-sixth the annual price increase. Further, the positive trade balance for R&D intensive products is now over $28 billion, whereas the balance for non-R&D intensive products is about at a $16 billion deficit.

Available information that indicates that the United States is losing its technological leadership and that our technological innovation is declining is generally based on broad highly aggregated data. Specific cases of industrial decisions to close research laboratories, to relocate R&D or manufacturing facilities abroad, and to postpone major capital investments sometimes are cited as due to a specific cause, such as a change in Federal capital gains tax, "unfair" competition from foreign firms in partnership with their governments, etc. Many factors influence such industrial decisions, and great care should be used to prevent either inaccurate generalizations or unsupportable claims of direct cause-and-effect relationships.

Although available information is valuable for showing general trends, we believe more microeconomic analysis and careful diagnosis of industry-specific problems should be the basis of Federal Government policies and programs.

Diagnostic studies should be initiated and aimed toward resolving two major issues. The first is how can the Federal Government alleviate the uncertainties in the economic outlook and the regulatory situation to stabilize the climate for long-term investment and enhance the confidence of the private sector for investment in plant expansion and innovative R&D? This issue, to a large extent, is concerned with the macroeconomic outlook and the Federal Government's general approach to regulation--especially economic regulation (e.g., price controls, monetary controls, taxes, etc.), and social regulation. However, it also involves facets which vary from one industry to another and/or some technology-specific factors, especially in environmental, health, and safety regulations.

The second major issue is what criteria should be used to determine when and how Federal intervention is necessary to assure adequate investment in R&D and/or capital formation for situations in which externalities

and inadequate market forces tend to cause the private sector to underinvest in areas of public need or opportunity? This issue encompasses a number of problems which need to be resolved. Included are needs to:

- Define and, to the extent feasible, quantify externalities associated with private investment in R&D.

- Establish criteria for distinguishing real from apparent market imperfections and, hence, determinants for Federal intervention. In particular, it is important to distinguish between those technological advances essential to meet national goals (e.g., defense and space) or which show substantial potential for social benefits (e.g., health and environment) that cannot be measured in economic terms from those which are aimed toward commercial markets for private economic gain. Special consideration needs to be given to major technology-intensive commercial ventures required to meet essential national needs or opportunities but which involve magnitude of investment, timeframes, and risks beyond the capacity of the private sector alone. The development of nuclear power is an example of such a venture.

- Develop criteria for selection of Federal methods of intervention to balance incentives and constraints that influence private-sector investment in R&D, capital formation, etc. Among the methods to be considered are:

  -- selective monetary and fiscal incentives,
  -- regulatory reform,
  -- selected relaxation of antitrust constraints,
  -- revision in patent policy,
  -- cost sharing,
  -- loan guarantees, and
  -- Government-funded contracts and grants, including cooperative agreements.

In light of these general comments, we suggest that the CED study:

- Assess the degree of correlation between productivity growth, technological innovation, and investment in R&D.

- Attempt to distinguish between the impact of specific Government-sponsored R&D programs and private-sector R&D in relation to commercial technological innovation.

- Conduct sector-specific analyses of the impact of domestic and foreign policies and regulations on capital formation,

R&D investment, and technological innovation; e.g., service industries as distinct from manufacturing, capital-intensive versus labor-intensive, small young versus large mature technology-intensive companies.

- Develop guidelines for Federal relationship with multinational corporations, especially with respect to international trade and other U.S. international objectives, including assistance to developing countries.

- Analyze antitrust constraints to determine whether they place U.S. industries at a disadvantage compared to foreign companies who have close cooperation with their own governments.

- Determine the extent to which Federal patent policies inhibit commercial technological innovation which can result from Federally sponsored R&D.

- Consider means to establish closer coupling between industrial laboratories and university graduate research centers.

Some of these suggestions undoubtedly require efforts beyond the scope contemplated within the proposed CED study, but perhaps could be commissioned as special tasks to be performed in-depth over a longer timeframe.

We hope these suggestions will be useful and would like to exchange information with you from time to time as your study progresses.

Sincerely yours,

Elmer B. Staats

Comptroller General
of the United States