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BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Chairman, Subcommittee On Energy, Nuclear Proliferation And Government Processes, Committee On Governmental Affairs, United States Senate

Inventory of Federal Programs Directly Related To Improving Private Sector Productivity

This report, an update of a 1980 inventory of federally funded programs related to private sector productivity, discusses

--the over $2.4 billion budget for the programs in fiscal year 1983,

--the lack of coordination among the programs, and

--the lack of review and evaluation of programs for their impact on private sector productivity.

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GENERAL GOVERNMENT
DIVISION

B-215403

The Honorable Charles H. Percy
Chairman, Subcommittee on Energy, Nuclear
Proliferation and Government Processes
Committee on Governmental Affairs
United States Senate

Dear Mr. Chairman:

We are responding to your request of November 18, 1981, that we update the inventory of federally funded programs directly related to private sector productivity improvement. In accordance with your request, we also determined

--the fiscal year 1983 budget for these programs,

--whether the programs overlap and duplicate one another,

--whether coordination exists among the programs, and

--the nature of agency and the Office of Management and Budget (OMB) review and evaluation.

As agreed with your office, we deferred work on this assignment until the budgets for some of the productivity programs were settled. Our objectives, scope, and methodology are presented in appendix I.

We estimate that the federal government spent over $2.4 billion in fiscal year 1983 on programs directly related to private sector productivity improvement within the following categories.

Federal program categories	Funds (thousands)	Percent
Technology innovation	$1,293,931	53.87
Management and operations	897,371	37.36
Technology transfer	184,796	7.69
Human resources	22,137	.92
Productivity measurement	3,719	.16
Total	$2,401,954	100.00

The 5 program categories are explained in appendix II, the full inventory of programs we identified for each of 13 departments and agencies is provided in appendix III, and the programs of the 5 departments and agencies which account for 78 percent of the funds spent in fiscal year 1983 are described in appendix IV.

Prior GAO reports have documented that federal productivity programs were not reviewed and evaluated nor coordinated through a central body.[1] Our current review found that in five departments and agencies accounting for 78 percent of the funds spent in fiscal year 1983, two of the federal programs directly related to private sector productivity were evaluated by the agencies in terms of their impact on productivity improvement. They were the forestry incentives program at the Department of Agriculture and the semiconductor program at the Department of Commerce. The other programs, when evaluated, were evaluated by agencies in terms of mission performance with no reference to their impact on private sector productivity. OMB budget examiners responsible for these programs told us they do not routinely review or evaluate the programs for their impact on private sector productivity.

Our current review also found little or no coordination of productivity programs. Although the Department of Commerce has the responsibility to assess whether resources being allocated to domestic industrial sectors of the economy which are likely to generate new technologies are adequate to, among other things, promote productivity growth, the Department does not have the authority to coordinate the efforts of the various agencies involved in stimulating private sector productivity. We found no overlap or duplication in the programs we reviewed.

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[1]Such reports include Federal Efforts Regarding Automated Manufacturing Need Stronger Leadership (GAO/AFMD-83-68, May 26, 1983) and Stronger Federal Effort Needed to Foster Private Sector Productivity (GAO/AFMD-81-29, Feb. 18, 1981).

By documenting current federal spending for productivity improvement, our inventory can be used by policymakers to analyze current federal involvement in private sector productivity improvement.

As agreed with your office, we did not obtain agency comments on this report. As arranged with your office, we are making full distribution of this report upon issuance.

Sincerely yours,

W. J. Anderson

William J. Anderson
Director

OBJECTIVES, SCOPE, AND METHODOLOGY

The objectives of this review were to (1) develop a fiscal year 1983 inventory of federally funded programs directly related to private sector productivity improvement, (2) examine the coordination, review and evaluation of these programs in terms of their productivity goals, and (3) determine whether the programs overlap and duplicate one another. For the purpose of this review, we are including only those programs directly related to improving private sector productivity, regardless of whether or not the specific purpose of a program is productivity improvement. In other words, programs directed at developing automated manufacturing technology or commercial applications of government research and discoveries were included. We did not, however, include programs indirectly affecting productivity, such as tax and regulatory policy or basic research. While these programs can strongly affect private sector productivity, their relationship to productivity is too tenuous for inclusion in a productivity program inventory.

The scope of the review was governmentwide, focusing on those federal agencies most extensively involved in private sector productivity. Those agencies include: the Departments of Agriculture, Commerce, Defense, and Energy and the National Aeronautics and Space Administration (NASA). Our review also included the work of the Office of Management and Budget (OMB) in reviewing and evaluating programs directly related to improving productivity.

In conducting the governmentwide review, we used the GAO Legislative, Authorization, Program and Budget Information System. This computer-based information system contains budget information, program descriptions, and objectives for over 6,000 federal programs.

Using various subject headings, we drew from this system all programs that seemed likely to affect private sector productivity. We categorized the programs in the inventory in terms of their relationship to (1) human resources, (2) management and operations, (3) productivity measurement, (4) technology innovation, or (5) technology transfer in the private sector. The definitions and descriptions of the categories are in appendix II. In order to assess the validity of our computer-based findings and obtain information on productivity program review, coordination, and evaluation, we contacted officials responsible for these programs in the five agencies listed above. When officials confirmed that their programs were directly related to private sector productivity, the programs became a part of the

APPENDIX I

inventory. These five agencies accounted for 95 percent of the expenditures for productivity related programs in a 1980 OMB inventory. While our inventory may not be all-inclusive, and some decisions concerning program inclusion were subjective, we believe that the inventory is reasonably thorough and comprehensive.

We completed our work regarding the review, coordination and evaluation of the programs by contacting appropriate OMB officials.

This review was performed in accordance with generally accepted government audit standards. Field work was conducted between September 1983 and January 1984.

EXPLANATION OF PRODUCTIVITY PROGRAM CATEGORIES

Human resources: Includes productivity programs which upgrade the skills and efficiency of the private sector work force, and projects which foster labor-management cooperation and improve the quality of working life. For our study, this includes programs such as the Department of Health and Human Services' program to improve efficiency in emergency medical services by providing training support assistance.

Management and operations: Includes productivity programs which provide assistance to firms and industries to improve management skills and to introduce new technology. For our study, this includes such programs as those which provide advisory services and training to small firms and assistance to health maintenance organizations.

Productivity measurement: Includes productivity programs which measure the efficiency with which a given industry output is produced by the resources expended. For our study, this includes programs which provide basic information on productivity trends and causes.

Technology innovation: Includes productivity programs focused on the application of knowledge gained in the laboratory in the development of technology that will enhance the productivity of the industrial and agricultural sectors. For our study, this includes programs which are primarily involved in demonstrating the commercial feasibility of research results.

Technology transfer: Includes productivity programs directed toward the diffusion of innovation through flows of information and techniques from the laboratory to the industrial sector as a means of increasing the yield from government expenditures for research and development activities, particularly in high technology areas. For our study, this includes such programs as those which operate networks of dissemination centers to provide technical information to the private sector.

Summary table

Inventory of Federal Programs Directly Related To Private Sector Productivity Improvement In Fiscal Year 1983

Department or agency	Technology transfer	Technology innovation	Productivity measurement	Management and operations	Human resources	Total private sector
	(thousands)					
Agriculture		$ 352,058		$470,410		$ 822,468
Commerce	$ 29,121	25,030	$ 156	70,934		125,241
Energy		390,727		4,322		395,049
Federal Mediation and Conciliation Service					$17,748	17,748
Bureau of Indian Affairs				10,488		10,488
Bureau of Mines		83,806				83,806
Labor			3,563		2,871	6,434
National Aeronautics and Space Administration	7,100	404,500				411,600
Small Business Administration				256,261		256,261
Tennessee Valley Authority		37,810				37,810
Maritime Administration	16,750			84,500		101,250
Health and Human Services	25			456	1,518	1,999
Department of Defense	131,800					131,800
Total	$184,796	$1,293,931	$3,719	$897,371	22,137	$2,401,954

APPENDIX III

Inventory of Federal Programs Directly Related To Private Sector Productivity Improvement in Fiscal Year 1983

Programs	Technology transfer	Technology innovation	Productivity measurement	Management and operations	Human resources
			(thousands)		
AGRICULTURE					
Research & Tech Assistance to Ag Cooperatives				4,563	
Processing, Storage, Distribution, Food Safety and Consumer Services Research		86,634			
Research on Plant Production		180,657			
Research on Animal Production		82,223			
Cost Sharing and Tech Assistance-Forestry Incentives Program				10,554	
Cost Sharing and Tech Assistance to Farmers-Agriculture Conservation Program				179,772	
Great Plains Conservation Program				21,442	
Technical Assistance				254,079	
Forest Products Utilization		2,544			

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Inventory of Federal Programs Directly Related To Private Sector Productivity Improvement in Fiscal Year 1983

Programs	Technology transfer	Technology innovation	Productivity measurement	Management and operations	Human resources
	(thousands)				
COMMERCE					
Industrial Productivity, Technology and Innovation			156	179	
Trade Adjustment Asst.— Tech Assistance Grants				13,094	
Dissemination of Tech Info	27,252				
Aquaculture Development		3,200			
Fisheries Development		5,000			
Marine Natural Products Development		500			
Fire Weather Services				700	
Agricultural Weather Services				1,000	
Trawling Efficiency Device		30			
Semiconductor Program		4,800			
Signals and Systems Metrology		5,800			
Automated Manufacturing Interface Standards		2,500			
Chemical Properties and Processes		3,200			
Minority Business Development Center				29,261	
Technology Commercialization Program	1,869				
Aviation Weather Services				26,700	

APPENDIX III

Inventory of Federal Programs Directly Related To Private Sector Productivity Improvement in Fiscal Year 1983

Programs	Technology transfer	Technology innovation	Productivity measurement	Management and operations	Human resources
	(thousands)				
ENERGY					
Coal: Heat Engines		7,826			
Coal: In-Situ Coal Gasification		5,568			
Coal: Combustion Systems		35,374			
Coal: Fuel Cells		25,939			
Coal: Magnetohydrodynamics		27,868			
Surface Coal Gasification		52,247			
Converter: High Temperature Gas Cooled Reactor		33,558			
Geothermal: Tech Development		18,200			
Geothermal: Hydrothermal Resources		18,200			
Industrial cogeneration		7,496			
Industrial Process Efficiency		10,598			
Implementation and Deployment				2,767	
Multi Sector Inventors Program				1,555	
Petroleum: Enhanced Oil Recovery		16,519			
Petroleum: Oil Shale		10,287			
Photovoltaic Energy System		79,556			
Solar: Wind Energy Systems		41,491			
FEDERAL MEDIATION AND CONCILIATION SERVICE					
Mediation Services					16,962
Labor-management Cooperation Project					786

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Inventory of Federal Programs Directly Related To Private Sector Productivity Improvement in Fiscal Year 1983

Programs	Technology transfer	Technology innovation	Productivity measurement	Management and operations	Human resources
	(thousands)				
DEPARTMENT OF LABOR					
Labor Management Relations Services					2,871
Productivity and Technology Statistics			3,563		
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION					
Productivity Studies and Conferences	400				
Aeronautical Research and Technology		280,000			
Independent Research and Development Projects		119,000			
Technological Briefs	1,200				
IAC Activities	2,500				
Application Engineering to Enhance Technology Transfer		5,500			
Technical Library Services	3,000				
SMALL BUSINESS ADMINISTRATION					
Investment Company Assistance				150,098	
Business Loans				71,713	
Management Assistance				34,450	
TENNESSEE VALLEY AUTHORITY					
National Fertilizer Development		37,810			

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Inventory of Federal Programs Directly Related To Private Sector Productivity Improvement in Fiscal Year 1983

Programs	Technology transfer	Technology innovation	Productivity measurement	Management and operations	Human resources
	(thousands)				
MARITIME ADMINISTRATION					
Ship Construction Subsidy				84,500	
Advanced Ship Development	16,750				
BUREAU OF INDIAN AFFAIRS					
Business Enterprise Development				10,488	
BUREAU OF MINES					
Minerals Research		55,046			
Coal: Mining Research and Development		28,760			
HEALTH AND HUMAN SERVICES					
Health Maintenance Organizations-Technical Assistance and Management Training				456	
Health Administration Traineeships					489
Dental Team Practice					558
Emergency Medical Services Training Support Assistance					471
Health Care Technology	25				
DEPARTMENT OF DEFENSE					
Manufacturing Technology	131,800				

APPENDIX III

DESCRIPTION OF PROGRAMS IN FIVE AGENCIES THAT ACCOUNT FOR 78 PERCENT OF FISCAL YEAR 1983 FUNDS SPENT IN DIRECT SUPPORT OF PRIVATE SECTOR PRODUCTIVITY

The Departments of Agriculture, Energy, Commerce, and Defense, and NASA accounted for 78 percent of the federal funds spent on programs we identified as directly related to improving private sector productivity. Over half of the $2.4 billion in expenditures can be attributed to the Departments of Agriculture (primarily for improving technology and innovation in farming and ranching) and Energy (primarily for industries processing or using various forms of energy).

DEPARTMENT OF AGRICULTURE

Most Department of Agriculture programs that support innovation and the transfer of emerging research findings to the private sector are located in the Agriculture Stabilization and Conservation Service, Agricultural Research Service, and Forest Service. In these organizations, improving private sector productivity means reducing losses in crop yields and production processes, enhancing or increasing the production of livestock or crops, and using natural resources previously wasted. The Forest Service was one of the organizations we reviewed which evaluated a program specifically in terms of productivity improvement. The evaluation stated that the program resulted in increased commercial timber production and should increase financial returns to the timber industry.

DEPARTMENT OF ENERGY

The development of the private sector's productive capacity is part of the 1977 charter for the Department of Energy. Consequently, a large proportion of its programs are joint efforts to develop more efficient and economical technology. Energy spent approximately $390 million on technology innovation projects during fiscal year 1983 that were directed at developing new production processes for the private sector.

DEPARTMENT OF COMMERCE

The focal point for Department of Commerce efforts related to private sector productivity is the Office of Productivity,

Technology and Innovation. The office, established in 1980, has been active in promoting industrial productivity through various activities and programs.

In 1983, the office published its own inventory of Commerce Department programs directly related to private sector productivity. The office conducted this inventory to determine the extent of the Department's involvement in productivity related activities. Through the use of a questionnaire to all Commerce agencies, the office found that 15 agencies budgeted $204 million during fiscal year 1983 on productivity improvement activities. We integrated the office's study into our inventory using our criteria which excluded those programs involving policy, promotion, and trade. As a result, we only included $125 million in expenditures.

DEPARTMENT OF DEFENSE

Private sector programs in the Department of Defense (DOD) are directed primarily toward providing incentives to increase capital investment and modernization in defense contractors' facilities and thereby to raise the productivity of defense acquisition programs. The programs we identified as directly related to private sector productivity are the Manufacturing Technology Program and the Industrial Modernization Incentives Program.

Manufacturing technology is one of several actions under DOD's Acquisition Improvement Program. The purpose of the Manufacturing Technology Program is to reduce material acquisition costs and lead times by providing the advanced manufacturing technology to improve productivity where the private sector is unable or unwilling to invest. Each of the services conducts its own manufacturing technology program. Four elements are included in this program: (1) generic manufacturing technology, (2) integrated computer-aided manufacturing, (3) manufacturing research and development, and (4) technology modernization. In fiscal year 1983, DOD spent $131 million on this program.

In fiscal year 1983, DOD initiated a test program (Industrial Modernization Incentives Program) to develop and refine contract incentives which encourage defense contractors to use their own funds for productivity enhancing capital investments. The contractor incentives include contractor investment protection and shared savings. This ongoing test program has not yet been evaluated for its impact on private sector productivity.

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NASA

NASA spent $411.6 million in fiscal year 1983 for activities which develop technology and result in practical applications which can be transferred to the private sector. One such program, Aeronautical Research and Technology, advances aeronautical technology so that air transportation systems are more economical and efficient. The Application Engineering to Enhance Technology Transfer program develops applications of NASA's aerospace technology to commercial use in the economy. This program uses a variety of transfer mechanisms to facilitate the use of these applications, such as NASA's Technical Briefs. There were 75,000 subscriptions to NASA Technical Briefs from U. S. businesses.

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