

6. FEDERAL INVESTMENT

Investment spending is spending that yields long-term benefits. Its purpose may be to improve the efficiency of internal Federal agency operations or to increase the Nation's overall stock of capital for economic growth. The spending can be direct Federal spending or grants to State and local governments. It can be for physical capital, which yields a stream of services over a period of years, or for research and development or education and training, which are intangible but also increase income in the future or provide other long-term benefits.

Most presentations in the Federal budget combine investment spending with spending for current use.

This chapter focuses solely on Federal and federally financed investment.

In this chapter, investment is discussed in the following sections:

- a description of the size and composition of Federal investment spending;
- a discussion of the performance of selected Federal investment programs; and
- a presentation of trends in the stock of federally financed physical capital, research and development, and education.

PART I. DESCRIPTION OF FEDERAL INVESTMENT

For more than fifty years, the Federal budget has included a chapter on Federal investment—defined as those outlays that yield long-term benefits—separately from outlays for current use. In recent years the discussion of the composition of investment has displayed estimates of budget authority as well as outlays.

The classification of spending between investment and current outlays is a matter of judgment. The budget has historically employed a relatively broad classification, encompassing physical investment, research, development, education, and training. The budget further classifies investments into those that are grants to State and local governments, such as grants for highways or education, and all other investments, called “direct Federal programs,” in this analysis. This “direct Federal” category consists primarily of spending for assets owned by the Federal Government, such as defense weapons systems and general purpose office buildings, but also includes grants to private organizations and individuals for investment, such as capital grants to Amtrak or higher education loans directly to individuals.

Presentations for particular purposes could adopt different definitions of investment:

- To suit the purposes of a traditional balance sheet, investment might include only those physical assets owned by the Federal Government, excluding capital financed through grants and intangible assets such as research and education.
- Focusing on the role of investment in improving national productivity and enhancing economic growth would exclude items such as national defense assets, the direct benefits of which enhance national security rather than economic growth.
- Concern with the efficiency of Federal operations would confine the coverage to investments that reduce costs or improve the effectiveness of inter-

nal Federal agency operations, such as computer systems.

- A “social investment” perspective might broaden the coverage of investment beyond what is included in this chapter to include programs such as childhood immunization, maternal health, certain nutrition programs, and substance abuse treatment, which are designed in part to prevent more costly health problems in future years.

The relatively broad definition of investment used in this section provides consistency over time—historical figures on investment outlays back to 1940 can be found in the separate *Historical Tables* volume. Table 6–2 at the end of this section allows disaggregation of the data to focus on those investment outlays that best suit a particular purpose.

In addition to this basic issue of definition, there are two technical problems in the classification of investment data involving the treatment of grants to State and local governments and the classification of spending that could be shown in more than one category.

First, for some grants to State and local governments it is the recipient jurisdiction, not the Federal Government, that ultimately determines whether the money is used to finance investment or current purposes. This analysis classifies all of the outlays in the category where the recipient jurisdictions are expected to spend most of the money. Hence, the community development block grants are classified as physical investment, although some may be spent for current purposes. General purpose fiscal assistance is classified as current spending, although some may be spent by recipient jurisdictions on physical investment.

Second, some spending could be classified in more than one category of investment. For example, outlays for construction of research facilities finance the acqui-

sition of physical assets, but they also contribute to research and development. To avoid double counting, the outlays are classified in the category that is most commonly recognized as investment. Consequently, outlays for the conduct of research and development do not include outlays for research facilities, because these outlays are included in the category for physical investment. Similarly, spending for physical investment and research and development related to education and training is included in the categories of physical assets and the conduct of research and development.

When direct loans and loan guarantees are used to fund investment, the subsidy value is included as investment. The subsidies are classified according to their program purpose, such as construction or education and training. For more information about the treatment of Federal credit programs, refer to Chapter 7, "Credit and Insurance", in this volume.

This section presents spending for gross investment, without adjusting for depreciation.

Composition of Federal Investment Outlays

Major Federal Investment

The composition of major Federal investment outlays is summarized in Table 6-1. They include major public physical investment, the conduct of research and development, and the conduct of education and training. Defense and nondefense investment outlays were \$368.5 billion in 2004. They are estimated to increase to \$396.5 billion in 2005 and are projected to decline slightly to \$395.1 billion in 2006. Major Federal investment outlays will comprise an estimated 15 percent of total Federal outlays in 2006 and 3.1 percent of the Nation's gross domestic product (GDP). Greater detail on Federal investment is available in Table 6-2 at the end of this section. That table includes both budget authority and outlays.

Physical investment. Outlays for major public physical capital investment (hereafter referred to as physical investment outlays) are estimated to be \$183.5 billion in 2006. Physical investment outlays are for construction and rehabilitation, the purchase of major equipment, and the purchase or sale of land and structures. More than three-fifths of these outlays are for direct physical investment by the Federal Government, with the remainder being grants to State and local governments for physical investment.

Direct physical investment outlays by the Federal Government are primarily for national defense. Defense outlays for physical investment are estimated to be \$88.9 billion 2006. Almost all of these outlays, or an estimated \$81.3 billion, are for the procurement of weapons and other defense equipment, and the remainder is primarily for construction on military bases, family housing for military personnel, and Department of Energy defense facilities.

Outlays for direct physical investment for nondefense purposes are estimated to be \$30.2 billion in 2006. These outlays include \$16.2 billion for construction and

rehabilitation. This amount includes funds for water, power, and natural resources projects of the Corps of Engineers, the Bureau of Reclamation within the Department of the Interior, and the Tennessee Valley Authority; construction and rehabilitation of veterans hospitals and Indian Health Service hospitals and clinics; facilities for space and science programs; Postal Service facilities; and construction for embassy security. Outlays for the acquisition of major equipment are estimated to be \$13.7 billion in 2006. The largest amounts are for the air traffic control system.

Grants to State and local governments for physical investment are estimated to be \$64.4 billion in 2006. More than two-thirds of these outlays, or \$45.9 billion, are to assist States and localities with transportation infrastructure, primarily highways. Other major grants for physical investment fund sewage treatment plants, community and regional development, and public housing.

Conduct of research and development. Outlays for the conduct of research and development are estimated to be \$124.9 billion in 2006. These outlays are devoted to increasing basic scientific knowledge and promoting research and development. They increase the Nation's security, improve the productivity of capital and labor for both public and private purposes, and enhance the quality of life. More than half of these outlays, an estimated \$73.5 billion, are for national defense. Physical investment for research and development facilities and equipment is included in the physical investment category.

Nondefense outlays for the conduct of research and development are estimated to be \$51.4 billion in 2006. These are largely for the National Aeronautics and Space Administration, the National Science Foundation, the National Institutes of Health, and research for nuclear and non-nuclear energy programs.

A more complete and detailed discussion of research and development funding appears in Chapter 5, "Research and Development" in this volume.

Conduct of education and training. Outlays for the conduct of education and training are estimated to be \$86.7 billion in 2006. These outlays add to the stock of human capital by developing a more skilled and productive labor force. Grants to State and local governments for this category are estimated to be \$52.3 billion in 2006, three-fifths of the total. They include education programs for the disadvantaged and individuals with disabilities, other education programs, training programs in the Department of Labor, and Head Start. Direct Federal education and training outlays are estimated to be \$34.3 billion in 2006. Programs in this category are primarily aid for higher education through student financial assistance, loan subsidies, the veterans GI bill, and health training programs.

This category does not include outlays for education and training of Federal civilian and military employees. Outlays for education and training that are for physical investment and for research and development are in

Table 6-1. COMPOSITION OF FEDERAL INVESTMENT OUTLAYS

(In billions of dollars)

	2004 Actual	Estimate	
		2005	2006
FEDERAL INVESTMENT			
Major public physical capital investment:			
Direct Federal:			
National defense	83.6	87.5	88.9
Nondefense	27.4	31.7	30.2
Subtotal, direct major public physical capital investment	111.0	119.1	119.1
Grants to State and local governments	59.4	61.9	64.4
Subtotal, major public physical capital investment	170.4	181.1	183.5
Conduct of research and development:			
National defense	65.3	71.4	73.5
Nondefense	48.0	51.1	51.4
Subtotal, conduct of research and development	113.4	122.4	124.9
Conduct of education and training:			
Grants to State and local governments	47.9	51.8	52.3
Direct Federal	36.8	41.1	34.3
Subtotal, conduct of education and training	84.7	92.9	86.7
Total, major Federal investment outlays	368.5	396.5	395.1
MEMORANDUM			
Major Federal investment outlays:			
National defense	149.0	158.8	162.4
Nondefense	219.5	237.6	232.7
Total, major Federal investment outlays	368.5	396.5	395.1
Miscellaneous physical investment:			
Commodity inventories	-1.4	0.2	-1.0
Other physical investment (direct)	2.8	3.3	3.0
Total, miscellaneous physical investment	1.4	3.5	2.0
Total, Federal investment outlays, including miscellaneous physical investment	369.8	399.9	397.1

the categories for physical investment and the conduct of research and development.

Miscellaneous Physical Investment Outlays

In addition to the categories of major Federal investment, several miscellaneous categories of investment outlays are shown at the bottom of Table 6-1. These items, all for physical investment, are generally unrelated to improving Government operations or enhancing economic activity.

Outlays for commodity inventories are primarily for the purchase or sale of agricultural products pursuant to farm price support programs. Sales are estimated to exceed purchases by \$1.0 billion in 2006.

Outlays for other miscellaneous physical investment are estimated to be \$3.0 billion in 2006. This category includes primarily conservation programs. These are entirely direct Federal outlays.

Detailed Table on Investment Spending

The following table provides data on budget authority as well as outlays for major Federal investment divided according to grants to State and local governments and direct Federal spending. Miscellaneous investment is not included because it is generally unrelated to improving Government operations or enhancing economic activity.

Table 6-2. FEDERAL INVESTMENT BUDGET AUTHORITY AND OUTLAYS: GRANT AND DIRECT FEDERAL PROGRAMS

(in millions of dollars)

Description	Budget Authority			Outlays		
	2004 Actual	2005 Estimate	2006 Estimate	2004 Actual	2005 Estimate	2006 Estimate
GRANTS TO STATE AND LOCAL GOVERNMENTS						
Major public physical investments:						
Construction and rehabilitation:						
Transportation:						
Highways	34,231	34,078	33,573	30,188	32,014	34,360
Mass transportation	7,813	8,450	8,517	7,567	8,183	8,284
Air transportation	3,649	3,697	2,531	2,958	3,042	3,264
Subtotal, transportation	45,693	46,225	44,621	40,713	43,239	45,908
Other construction and rehabilitation:						
Pollution control and abatement	2,445	2,190	1,938	2,066	1,961	1,886
Community and regional development	6,207	6,063	4,276	6,761	6,783	6,766
Housing assistance	6,843	6,508	5,846	7,659	7,877	7,924
Other construction	393	434	204	613	444	329
Subtotal, other construction and rehabilitation	15,888	15,195	12,264	17,099	17,065	16,905
Subtotal, construction and rehabilitation	61,581	61,420	56,885	57,812	60,304	62,813
Other physical assets	1,772	1,585	1,279	1,599	1,619	1,542
Subtotal, major public physical capital	63,353	63,005	58,164	59,411	61,923	64,355
Conduct of research and development:						
Agriculture	267	270	148	269	275	218
Other	414	389	353	327	343	454
Subtotal, conduct of research and development	681	659	501	596	618	672
Conduct of education and training:						
Elementary, secondary, and vocational education	36,609	37,175	37,191	32,194	36,298	36,840
Higher education	510	506	33	499	615	515
Research and general education aids	728	801	738	714	822	822
Training and employment	3,476	3,509	4,232	4,064	3,378	3,655
Social services	9,936	10,120	9,541	9,746	10,002	9,795
Agriculture	444	451	437	424	426	410
Other	260	281	249	234	261	272
Subtotal, conduct of education and training	51,963	52,843	52,421	47,875	51,802	52,309
Subtotal, grants for investment	115,997	116,507	111,086	107,882	114,343	117,336
DIRECT FEDERAL PROGRAMS						
Major public physical investment:						
Construction and rehabilitation:						
National defense:						
Military construction and family housing	6,666	7,154	7,365	6,368	6,291	6,937
Atomic energy defense activities and other	811	527	639	754	564	632
Subtotal, national defense	7,477	7,681	8,004	7,122	6,855	7,569
Nondefense:						
International affairs	1,464	1,471	1,591	1,319	1,403	1,477
General science, space, and technology	1,706	2,034	2,214	1,485	1,860	2,332
Water resources projects	3,061	3,249	2,753	2,812	3,083	2,978
Other natural resources and environment	1,117	1,025	888	972	1,087	996
Energy	1,537	1,492	1,475	1,534	1,493	1,443
Postal Service	638	1,065	847	456	491	702
Transportation	51	194	101	55	152	190
Veterans hospitals and other health facilities	1,288	1,912	1,531	1,748	2,633	2,792
Federal Prison System	161	25	-289	282	128	199
GSA real property activities	1,747	1,616	1,670	1,329	1,518	1,729
Other construction	2,672	2,576	1,178	2,140	2,971	1,358

Table 6-2. FEDERAL INVESTMENT BUDGET AUTHORITY AND OUTLAYS: GRANT AND DIRECT FEDERAL PROGRAMS—Continued

(in millions of dollars)

Description	Budget Authority			Outlays		
	2004 Actual	2005 Estimate	2006 Estimate	2004 Actual	2005 Estimate	2006 Estimate
Subtotal, nondefense	15,442	16,659	13,959	14,132	16,819	16,196
Subtotal, construction and rehabilitation	22,919	24,340	21,963	21,254	23,674	23,765
Acquisition of major equipment:						
National defense:						
Department of Defense	83,072	78,345	78,043	76,232	80,255	80,870
Atomic energy defense activities	385	381	473	296	387	470
Subtotal, national defense	83,457	78,726	78,516	76,528	80,642	81,340
Nondefense:						
General science and basic research	603	588	676	569	612	621
Space flight, research, and supporting activities	542	710	650	475	751	563
Postal Service	598	1,389	672	452	914	972
Air transportation	3,367	3,183	3,254	3,527	3,624	3,312
Water transportation (Coast Guard)	919	941	1,209	671	851	920
Other transportation (railroads)	1,218	1,207	360	1,282	1,259	360
Hospital and medical care for veterans	920	725	1,096	1,734	1,367	2,067
Law enforcement activities	1,851	1,794	1,880	1,348	1,962	1,740
Department of the Treasury (fiscal operations)	506	319	304	481	455	387
Department of Commerce (NOAA)	719	865	913	638	762	927
GSA general services funds	750	768	906	672	807	906
Other	721	804	788	854	911	882
Subtotal, nondefense	12,714	13,293	12,708	12,703	14,275	13,657
Subtotal, acquisition of major equipment	96,171	92,019	91,224	89,231	94,917	94,997
Purchase or sale of land and structures:						
National defense	-40	-38	-27	-40	-38	-27
Natural resources and environment	251	187	164	302	328	200
General government	170	161	168	222	224	205
Other	56	59	-13	37	36	-13
Subtotal, purchase or sale of land and structures	437	369	292	521	550	365
Subtotal, major public physical investment	119,527	116,728	113,479	111,006	119,141	119,127
Conduct of research and development:						
National defense:						
Defense military	65,410	70,267	70,789	61,510	67,016	69,549
Atomic energy and other	3,723	3,910	3,814	3,835	4,353	3,990
Subtotal, national defense	69,133	74,177	74,603	65,345	71,369	73,539
Nondefense:						
International affairs	264	255	255	254	258	258
General science, space, and technology:						
NASA	7,853	7,686	10,835	8,037	7,970	6,987
National Science Foundation	3,790	3,711	3,756	3,439	3,754	3,724
Department of Energy	2,736	2,787	2,682	2,701	2,706	2,655
Subtotal, general science, space, and technology	14,643	14,439	17,528	14,431	14,688	13,624
Energy	1,373	1,225	1,352	1,387	1,463	1,498
Transportation:						
Department of Transportation	479	564	620	431	558	672
NASA	1,056	906	852	551	871	838
Other	12	16		17	16	7
Subtotal, transportation	2,920	2,711	2,824	2,386	2,908	3,015
Health:						
National Institutes of Health	26,900	27,503	27,821	24,498	26,388	27,384
All other health	685	681	649	760	585	602

Table 6-2. FEDERAL INVESTMENT BUDGET AUTHORITY AND OUTLAYS: GRANT AND DIRECT FEDERAL PROGRAMS—Continued

(in millions of dollars)

Description	Budget Authority			Outlays		
	2004 Actual	2005 Estimate	2006 Estimate	2004 Actual	2005 Estimate	2006 Estimate
Subtotal, health	27,585	28,184	28,470	25,258	26,973	27,986
Agriculture	1,468	1,601	1,346	1,425	1,460	1,330
Natural resources and environment	2,084	2,033	1,971	1,574	1,494	1,589
National Institute of Standards and Technology	397	416	342	493	406	472
Hospital and medical care for veterans	866	784	786	850	792	777
All other research and development	1,425	1,666	1,811	1,021	1,739	1,938
Subtotal, nondefense	51,388	51,834	55,078	47,438	50,460	50,731
Subtotal, conduct of research and development	120,521	126,011	129,681	112,783	121,829	124,270
Conduct of education and training:						
Elementary, secondary, and vocational education	1,530	1,593	1,273	1,691	1,904	1,627
Higher education	25,233	29,487	27,283	25,201	28,892	22,461
Research and general education aids	1,890	1,888	1,910	1,883	1,997	1,949
Training and employment	1,576	1,629	1,616	1,552	1,571	1,646
Health	1,557	1,567	1,178	1,858	1,504	1,404
Veterans education, training, and rehabilitation	2,556	2,772	3,245	2,707	3,084	3,240
General science and basic research	941	948	871	878	969	948
National defense	9	8		11	8	
International affairs	355	384	458	441	377	418
Other	631	675	543	558	835	653
Subtotal, conduct of education and training	36,278	40,951	38,377	36,780	41,141	34,346
Subtotal, direct Federal investment	276,326	283,690	281,537	260,569	282,111	277,743
Total, Federal investment	392,323	400,197	392,623	368,451	396,454	395,079

PART II: PERFORMANCE OF FEDERAL INVESTMENT

Introduction. In recent years there has been increased emphasis on improving the performance of Government programs. This emphasis began with the Performance and Results Act of 1993, which requires agencies to prepare strategic plans and annual performance plans, and then report on their actual performance annually.

This Administration set out to ensure that agencies worked to improve their performance, not just report on it. Beginning in the 2004 Budget, the Administration began to assess every Federal program by a method known as the Program Assessment Rating Tool, or PART. The Administration set a target of assessing all Federal programs over five years. With this budget, the third year of using the PART, the Administration has assessed over 600 programs, about three-fifths of the Federal Budget.

The PART system assesses each program in four components (purpose, planning, management, and results/accountability) and gives a score for each of the components. The scores for each component are then weighted—results/accountability carries the greatest weight—and the program is given an overall score. A program is rated effective if it receives an overall score of 85 percent or more, moderately effective if the score is

70 to 84 percent, adequate if the score is 50 to 69 percent, and inadequate if the score is 49 percent or lower. The program receives a rating “Results Not Demonstrated” if it does not have a good long-term and annual performance measure or does not have data to report on its measures. Chapter 2 of this volume discusses the PART concepts in more detail.

This section summarizes the results of the PART for direct investment programs, defined to include capital assets, research and development, and education and training. Because an entire program is assessed, not just the investment portion of the program, the assessments for some programs may cover more than just the investment spending. PART assessments of programs that are grants to State and local governments are not summarized in this chapter but are summarized in Chapter 8, “Aid to State and Local Governments”, in this volume.

This section summarizes 166 programs:

- Programs for capital assets are those identified in the PART system as “capital assets and service acquisition” (60 programs);
- Programs for research and development are essentially those identified in the PART system as “research and development” (84 programs); and

- Programs for education and training (22 programs) are primarily programs in the Department of Education that are not grants to State and local governments (e.g., Federal Pell grants to individuals). This category also includes programs in other agencies, such as the Montgomery GI Bill in the Department of Veterans Affairs, the Health Professions program in the Department of Health and Human Services, and the Job Corps program in the Department of Labor.

Information on these and other programs assessed by PART is on the CD ROM that accompanies this volume.

Summary of ratings. Table 6–3 shows that the average weighted score for the 166 investment programs that have been rated by PART was 67 percent, which is a rating of “adequate”. These programs had total spending of \$184.6 billion in 2004. Of these programs:

- 37 were rated effective (\$35.8 billion);
- 48 were rated moderately effective (\$57.7 billion);
- 28 were rated adequate (\$50.6 billion);
- 7 were rated ineffective (\$7.4 billion); and
- 46 were rated “results not demonstrated” (\$33.2 billion);

Table 6–3. SUMMARY OF PART RATINGS AND SCORES FOR DIRECT FEDERAL INVESTMENT PROGRAMS

(excludes grants to State and local governments for investment)

Criteria	Type of Investment			
	Physical capital	Research and development	Education and training	All investment programs
Average Scores				
Purpose	81%	92%	79%	86%
Planning	75%	80%	75%	78%
Management	81%	86%	66%	82%
Results/Accountability	48%	59%	37%	52%
Weighted Average ¹	64%	73%	55%	67%
Average Rating	Adequate	Moderately effective	Adequate	Adequate
Number of Programs				
Ratings ²				
Effective	10	25	2	37
Moderately effective	15	31	2	48
Adequate	11	9	8	28
Ineffective	2	2	3	7
Results not demonstrated	22	17	7	46
Total number of investment programs rated	60	84	22	166
In millions of dollars (2004)				
Effective	\$3,595	\$31,782	\$401	35,778
Moderately effective	41,781	14,179	1,736	57,696
Adequate	27,600	945	22,025	50,570
Ineffective	6,389	78	886	7,353
Results not demonstrated	25,492	3,407	4,337	33,236
All investment programs that were rated in PART	\$104,857	\$50,391	\$29,385	\$184,633

¹ Weighted as follows: Purpose (20%), Planning (10%), Management (20%), Results/Accountability (50%).

² The rating of effective indicates a score of 85 percent or more; moderately effective, 70–84 percent; adequate, 50–69 percent; and ineffective, 49 percent or less.

Assessments of individual programs. The ratings of the ten physical capital and education and training investment programs with the largest funding are summarized here. Information on research and development is in Chapter 5, “Research and Development” in this volume.

Capital Assets

Department of Defense (DOD). Air Combat Program (\$13.9 billion in 2004). Rating: *Moderately Effective*. This program consists of a number of individual aircraft and helicopter research, development and procurement programs that, taken together, comprise DOD’s invest-

ment in air combat capabilities. The PART analysis showed that the program purpose is clear owing to the unique military requirement for these systems.

Department of Defense. Shipbuilding (\$12.0 billion in 2004). Rating: *Adequate*. This program buys new ships and overhauls older ships for the Navy. The assessment shows that the program has a clear purpose, and the Navy has specific cost, schedule, and performance goals for each shipbuilding program. The program has experienced cost increases and schedule slips on some ship construction programs.

Department of Defense. Missile Defense (\$8.6 billion in 2004). Rating: *Moderately Effective*. This program consists of various systems and capabilities developed by the Missile Defense Agency (MDA) and military services. This program acquires and operates active defenses against short, medium, and long-range missiles in a global, multi-layered defensive system.

The assessment found that: a) the Department of Defense has aggressively worked to fund operations and support costs fully, and has been successful in coordinating service and MDA budget responsibilities; b) the Department continues to fund only two years deployment costs per each "block" of missile defense deployments, even if significant portions of those deployments require four to five years of funding to fully implement. This policy continues to put at risk the completion of approved missile defense deployments; and c) MDA did not meet its testing goals in 2004 for the Ground Based Mid-Course Defense system, the main element of its first operational deployment.

Tennessee Valley Authority. TVA Power (\$7.7 billion in 2004). Rating: *Moderately Effective*. TVA is the fifth largest electric utility in the country, generating power at 48 coal-fired, hydropower, nuclear, and other power plants that it operates to meet the electricity needs of 8.3 million people (3 percent of the U. S. market). The PART assessment gave TVA mixed reviews. TVA does an excellent job generating power at its existing power plants. A decade ago TVA's nuclear power plants posed serious technical and safety problems but it has overcome these problems and today its nuclear power plants set industry standards.

However, TVA has a high level of debt compared to many of its competitors in the electricity industry. It also lacks a strategic plan, which makes it hard to assess TVA's plans to spend funds on additional power plants and transmission lines.

Department of Energy. Environmental Management (\$7.1 billion in 2004). Rating: *Adequate*. This program protects human health and the environment by cleaning up waste and contamination resulting from more than 50 years of nuclear weapons production and energy research at 114 Department of Energy sites in the United States and its territories. Program managers will continue to work with Federal and State regulators to resolve outstanding issues with revised cleanup plans. The program has established annual cost and schedule performance measures.

General Services Administration. GSA's Regional IT Solutions Program (\$5.4 billion in 2004). Rating: *Results Not Demonstrated*. This program provides expert technical, acquisition, and information technology products and services to Federal clients. This assessment found that the program is useful to Federal agencies that do not have in-house expertise to acquire IT products or services. The assessment also found that the program does not have long-term outcome goals that relate to other Government agencies or the private sector.

Department of Defense. Airlift Program (\$5.1 billion in 2004). Rating: *Moderately Effective*. This program consists of a number of individual Air Force tactical and strategic airlift aircraft research, development and procurement programs that, taken together, comprise DOD's investment in airlift capabilities. The analysis showed that this is a coherent program with a clear and basic long-term goal, namely to be able to move military forces and their equipment from the U.S. to anywhere in the world whenever required. DOD must aggressively examine possible trade-offs within the program that could lower the cost of meeting the airlift requirement without sacrificing military readiness or combat capabilities.

Department of Housing and Urban Development. Project-Based Rental Assistance (\$4.8 billion in 2004). Rating: *Ineffective*. This program provides funding to landlords who rent a certain number of affordable apartments to low-income families or individuals. Assistance is tied directly to the properties; tenants can generally not move without losing their assistance. The program receives low performance scores in part because there is confusion over program objectives, the program lacks strong financial accountability, and it produces poor results relative to alternative forms of housing assistance.

Education

Department of Education. Federal Pell Grants (\$12.0 billion in 2004). Rating: *Adequate*. This program provides grant aid to nearly five million needy students to help them pay for an undergraduate education. The assessment found that the program helps ensure that low-income students can afford a college education. However, the Department of Education has only been minimally successful in achieving its long-term and annual performance goals for its main student aid programs. In addition, Pell grants, like other student aid, are prone to abuse, where students who under-report family income receive more aid than they should. The Department estimates that net overawards in the Pell program total more than \$350 million annually.

Department of Education. Federal Family Education Loan Program (\$9.6 billion in 2004). Rating: *Adequate*. Under the Federal Family Education Loan (FFEL) Program, the Department encourages private lenders to make loans to undergraduate and graduate students by guaranteeing such loans in the case of default and providing lenders with financial subsidies that ensure

a minimum rate of return on all loans made. Overall, the assessment concluded that both this program and the William D. Ford Direct Student Loan program fulfill their purpose of ensuring that low- and middle-income students can afford the costs of postsecondary

education. The program also has meaningful performance measures and outcome data on these measures. However, the Department has been minimally successful in achieving its long-term and annual performance goals for its main student aid programs.

PART III: FEDERALLY FINANCED CAPITAL STOCKS

Federal investment spending creates a “stock” of capital that is available in the future for productive use. Each year, Federal investment outlays add to this stock of capital. At the same time, however, wear and tear and obsolescence reduce it. This section presents very rough measures over time of three different kinds of capital stocks financed by the Federal Government: public physical capital, research and development (R&D), and education.

Federal spending for physical assets adds to the Nation’s capital stock of tangible assets, such as roads, buildings, and aircraft carriers. These assets deliver a flow of services over their lifetime. The capital depreciates as the asset ages, wears out, is accidentally damaged, or becomes obsolete.

Federal spending for the conduct of research and development adds to an “intangible” asset, the Nation’s stock of knowledge. Spending for education adds to the stock of human capital by providing skills that help make people more productive. Although financed by the Federal Government, the research and development or education can be carried out by Federal or State government laboratories, universities and other nonprofit organizations, local governments, or private industry. Research and development covers a wide range of activities, from the investigation of subatomic particles to the exploration of outer space; it can be “basic” research without particular applications in mind, or it can have a highly specific practical use. Similarly, education includes a wide variety of programs, assisting people of all ages beginning with pre-school education and extending through graduate studies and adult education. Like physical assets, the capital stocks of R&D and education provide services over a number of years and depreciate as they become outdated.

For this analysis, physical and R&D capital stocks are estimated using the perpetual inventory method.

Each year’s Federal outlays are treated as gross investment, adding to the capital stock; depreciation reduces the capital stock. Gross investment less depreciation is net investment. The estimates of the capital stock are equal to the sum of net investment in the current and prior years. A limitation of the perpetual inventory method is that the original investment spending may not accurately measure the current value of the asset created, even after adjusting for inflation, because the value of existing capital changes over time due to changing market conditions. However, alternative methods for measuring asset value, such as direct surveys of current market worth or indirect estimation based on an expected rate of return, are especially difficult to apply to assets that do not have a private market, such as highways or weapons systems.

In contrast to physical and R&D stocks, the estimate of the education stock is based on the replacement cost method. Data on the total years of education of the U.S. population are combined with data on the current cost of education and the Federal share of education spending to yield the cost of replacing the Federal share of the Nation’s stock of education.

It should be stressed that these estimates are rough approximations, and provide a basis only for making broad generalizations. Errors may arise from uncertainty about the useful lives and depreciation rates of different types of assets, incomplete data for historical outlays, and imprecision in the deflators used to express costs in constant dollars. The methods used to estimate capital stocks are discussed further in the technical note at the end of Chapter 13, “Stewardship,” in this volume. Additional detail about these methods appeared in a methodological note in Chapter 7, “Federal Investment Spending and Capital Budgeting,” in the *Analytical Perspectives* volume of the 2004 Budget.

The Stock of Physical Capital

This section presents data on stocks of physical capital assets and estimates of the depreciation of these assets.

Trends. Table 6–4 shows the value of the net federally financed physical capital stock since 1960, in constant fiscal year 2000 dollars. The total stock grew at a 2.2 percent average annual rate from 1960 to 2004, with periods of faster growth during the late 1960s

and the 1980s. The stock amounted to \$2,197 billion in 2004 and is estimated to increase to \$2,315 billion by 2006. In 2004, the national defense capital stock accounted for \$661 billion, or 30 percent of the total, and nondefense stocks for \$1,536 billion, or 70 percent of the total.

Table 6-4. NET STOCK OF FEDERALLY FINANCED PHYSICAL CAPITAL

(In billions of 2000 dollars)

Fiscal Year	Total	National Defense	Nondefense								
			Total Non- defense	Direct Federal Capital			Capital Financed by Federal Grants				
				Total	Water and Power	Other	Total	Trans- portation	Commu- nity and Regional	Natural Resources	Other
Five year intervals:											
1960	849	608	242	95	59	36	146	89	27	21	10
1965	937	589	348	123	74	49	225	158	32	22	13
1970	1,101	630	470	146	88	58	324	230	47	26	21
1975	1,137	545	592	166	102	64	426	282	76	42	25
1980	1,258	494	763	195	123	72	568	342	121	79	27
1985	1,462	572	890	222	136	86	668	397	146	100	26
1990	1,740	722	1,018	256	147	109	762	462	158	113	28
1995	1,882	714	1,168	297	157	141	871	534	168	123	46
Annual data:											
2000	1,979	635	1,345	337	160	178	1,007	618	183	131	75
2001	2,023	631	1,391	351	163	188	1,040	640	186	132	81
2002	2,078	636	1,442	366	165	201	1,076	666	189	134	87
2003	2,138	646	1,492	380	166	213	1,112	690	193	135	94
2004	2,197	661	1,536	390	168	223	1,146	714	196	136	100
2005 estimate	2,259	677	1,582	403	169	234	1,179	738	199	137	105
2006 estimate	2,315	690	1,625	413	170	244	1,211	762	201	138	110

Real stocks of defense and nondefense capital show very different trends. Nondefense stocks have grown consistently since 1970, increasing from \$470 billion in 1970 to \$1,536 billion in 2004. With the investments proposed in the budget, nondefense stocks are estimated to grow to \$1,625 billion in 2006. During the 1970s, the nondefense capital stock grew at an average annual rate of 5.0 percent. In the 1980s, however, the growth rate slowed to 2.9 percent annually, with growth continuing at about that rate since then.

Real national defense stocks began in 1970 at a relatively high level, and declined steadily throughout the decade as depreciation from investment in the Vietnam era exceeded new investment in military construction and weapons procurement. Starting in the early 1980s, a large defense buildup began to increase the stock of defense capital. By 1987, the defense stock exceeded its earlier Vietnam-era peak. In the early 1990s, however, depreciation on the increased stocks and a slower pace of defense physical capital investment began to reduce the stock from its previous levels. The increased defense investment in the last few years has reversed this decline, increasing the stock from an estimated \$661 billion in 2004 to \$690 billion in 2006.

Another trend in the Federal physical capital stocks is the shift from direct Federal assets to grant-financed assets. In 1960, 39 percent of federally financed nondefense capital was owned by the Federal Government, and 61 percent was owned by State and local governments but financed by Federal grants. Expansion in Federal grants for highways and other State and local capital, coupled with slower growth in direct Federal investment for water resources, for example, shifted the composition of the stock substantially. In 2004, 25 percent of the nondefense stock was owned by the Federal

Government and 75 percent by State and local governments.

The growth in the stock of physical capital financed by grants has come in several areas. The growth in the stock for transportation is largely grants for highways, including the Interstate Highway System. The growth in community and regional development stocks occurred largely following the enactment of the community development block grant in the early 1970s. The value of this capital stock has grown only slowly in the past few years. The growth in the natural resources area occurred primarily because of construction grants for sewage treatment facilities. The value of this federally financed stock has increased about 35 percent since the mid-1980s.

The Stock of Research and Development Capital

This section presents data on the stock of research and development capital, taking into account adjustments for its depreciation.

Trends. As shown in Table 6-5, the R&D capital stock financed by Federal outlays is estimated to be \$1,099 billion in 2004 in constant 2000 dollars. Roughly half is the stock of basic research knowledge; the remainder is the stock of applied research and development.

The nondefense stock accounted for about three-fifths of the total federally financed R&D stock in 2004. Although investment in defense R&D has exceeded that of nondefense R&D in nearly every year since 1981, the nondefense R&D stock is actually the larger of the two, because of the different emphasis on basic research and applied research and development. Defense R&D spending is heavily concentrated in applied research and development, which depreciates much more quickly

than basic research. The stock of applied research and development is assumed to depreciate at a ten percent geometric rate, while basic research is assumed not to depreciate at all.

The defense R&D stock rose slowly during the 1970s, as gross outlays for R&D trended down in constant dollars and the stock created in the 1960s depreciated. Increased defense R&D spending from 1980 through 1990 led to a more rapid growth of the R&D stock. Subsequently, real defense R&D outlays tapered off, depreciation grew, and, as a result, the real net defense R&D stock stabilized at around \$420 billion. Renewed spending for defense R&D in recent years has begun

to increase the stock, and it is projected to increase to \$531 billion in 2006.

The growth of the nondefense R&D stock slowed from the 1970s to the 1980s, from an annual rate of 3.8 percent in the 1970s to a rate of 2.1 percent in the 1980s. Gross investment in real terms fell during much of the 1980s, and about three-fourths of new outlays went to replacing depreciated R&D. Since 1988, however, nondefense R&D outlays have been on an upward trend while depreciation has edged down. As a result, the net nondefense R&D capital stock has grown more rapidly.

Table 6-5. NET STOCK OF FEDERALLY FINANCED RESEARCH AND DEVELOPMENT ¹

(In billions of 2000 dollars)

Fiscal Year	National Defense			Nondefense			Total Federal		
	Total	Basic Research	Applied Research and Development	Total	Basic Research	Applied Research and Development	Total	Basic Research	Applied Research and Development
Five year intervals:									
1970	261	16	245	215	67	148	475	82	393
1975	276	21	256	262	97	165	538	118	421
1980	279	25	255	311	131	179	590	156	434
1985	321	30	291	339	174	165	659	204	455
1990	403	36	367	382	229	154	785	265	520
1995	423	43	380	461	294	167	884	336	547
Annual data:									
2000	423	48	375	543	368	175	966	416	549
2001	421	50	371	563	386	177	984	436	548
2002	435	52	383	579	405	175	1,014	457	557
2003	454	54	401	598	424	174	1,052	478	575
2004	479	55	424	620	446	174	1,099	501	598
2005 estimate	506	56	449	643	468	175	1,149	524	624
2006 estimate	531	57	473	665	489	176	1,196	547	649

¹ Excludes stock of physical capital for research and development, which is included in Table 6-4.

The Stock of Education Capital

This section presents estimates of the stock of education capital financed by the Federal Government.

As shown in Table 6-6, the federally financed education stock is estimated at \$1,309 billion in 2004 in constant 2000 dollars. The vast majority of the Nation's education stock is financed by State and local governments, and by students and their families themselves. This federally financed portion of the stock represents

about 3 percent of the Nation's total education stock.¹ Nearly three-quarters is for elementary and secondary education, while the remaining one quarter is for higher education.

The federally financed education stock has grown steadily in the last few decades, with an average annual growth rate of 5.3 percent from 1970 to 2004. The expansion of the education stock is projected to continue under this budget, with the stock rising to \$1,428 billion in 2006.

¹ For estimates of the total education stock, see table 13-4 in Chapter 13, "Stewardship."

Table 6-6. NET STOCK OF FEDERALLY FINANCED EDUCATION CAPITAL

(In billions of 2000 dollars)

Fiscal Year	Total Education Stock	Elementary and Secondary Education	Higher Education
Five year intervals:			
1960	70	51	20
1965	98	71	27
1970	225	176	49
1975	324	260	64
1980	458	356	102
1985	565	421	144
1990	745	550	195
1995	853	619	234
Annual data:			
2000	1,120	819	302
2001	1,169	844	325
2002	1,210	873	336
2003	1,263	915	348
2004	1,309	953	355
2005 estimate	1,364	997	368
2006 estimate	1,428	1,049	379