

The Federal Productivity Measurement Program: final results

Results from this program, established more than a quarter of a century ago, show a small, but steady, increase in output per employee year in the Federal Government from 1967 to 1994, with the rate slowing somewhat after 1982

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For more than two decades, the Bureau of Labor Statistics collected, analyzed, and published data on labor productivity in the Federal Government. The statistics that emanated from the Federal Productivity Measurement Program now cover 27 years (1967–94). As a result of recent budgetary constraints, BLS data collection has been trimmed, and several projects and programs, including the Federal Productivity Measurement Program, have been terminated. This article presents some of the statistics produced by the program during its operation. We begin with a brief summary of the history and conceptual underpinnings of the program.

Institutional background

The Federal Productivity Measurement Program evolved from several congressional concerns in the early 1970s, a period when there was great interest in the rate of inflation and the status of productivity in the United States in relation to the other industrialized countries of the world. While the discussion centered on private sector productivity, some members of Congress were interested in the productivity of the Federal Government, which was expanding very rapidly at that time.¹ In response to these concerns, and to a specific congressional request, the Office of Management and Budget (OMB), the Civil

Service Commission (now the Office of Personnel Management), and the General Accounting Office established a joint working group to examine the issue. One assignment of this group was to determine how to measure Federal productivity, which resulted in the inclusion of the Bureau of Labor Statistics in the investigation. Following congressional testimony and a number of reports, a formal productivity improvement program was established by the OMB in July 1973. Under OMB guidance, the Bureau was assigned the responsibility of collecting data and constructing the associated productivity indexes. Measurement was only one part of the larger program, which also addressed employee training, management improvement, capital investment, and employee pay and incentives.

A variety of Federal organizations, including the OMB, the General Service Administration, the Joint Financial Management Improvement Program, the National Center for Productivity and Quality of Working Life, and the Office of Personnel Management, directed and coordinated the program during its operation. When the last of these terminated its productivity program in the early 1980s, the governmentwide productivity improvement program was allowed to lapse. At the time, in response to another congressional request, the Bureau alone assumed the responsibility for data collection, analysis, and publication of

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Federal Government productivity statistics.² This procedure continued until the termination of the program last year.

In fulfilling the congressional and other requests, the Bureau asked each Federal agency with 200 or more employees to provide data annually on its outputs, the labor used to produce those outputs, and the compensation paid to the employees producing the outputs. The Bureau worked closely with these organizations to identify their outputs, to improve their measures, and to help them prepare the data. However, because the program was voluntary, some agencies chose not to participate. For those agencies, the Bureau culled information from annual reports, budgets, and congressional testimony to compute the indexes whenever possible. Using this information, along with that provided by the agencies that did participate, the Bureau computed five indexes for each organization: output, labor input, compensation per employee year, output per employee year, and unit labor cost.

The indexes and other statistics were analyzed and summarized before being returned to the participating organizations for their own use. In addition, statistics were calculated on a number of levels, including the organization, agency, function, sector, and total level. Only the governmentwide function and summary statistics, however, were published.

In 1994, the last year for which data were collected, the statistics represented 60 agencies, 255 organizations, and 2 million Federal civilian employees. The data covered about 69 percent of the civilian labor force in the executive branch of the Government. While coverage varied from year to year, it grew after the inception of the program. In 1967, about half of the civilian labor force was included; by 1972, the figure had reached 60 percent, and it remained in the mid- to upper sixties for the duration of the program.³

Conceptual underpinnings

The same general concepts used to measure private sector productivity were employed to develop the Federal Productivity Measurement Program.⁴ That is, the BLS program focused on the relationship between the output of goods and services and the inputs expended to produce that output. Inputs for the Federal program were restricted to labor.

The measurement of output was the most difficult and challenging part of the program. As with private sector measurement, the output measures were chosen to reflect the final output of the organization being measured. For some organizations, such as the enterprise services, there were tangible outputs that were relatively easy to measure. Examples are the pieces of mail delivered by the postal service and the kilowatthours of electricity sold by the Tennessee Valley Authority.

For organizations that were part of the defense and diplomatic service, final outputs were difficult or even impossible to

define, much less measure. For these organizations, particularly the Department of Defense, the measurement focus shifted to intermediate activities such as personnel and supply. In such cases, the measured outputs were final from the perspective of the organization being measured, although they were not final from the perspective of the Federal Government, because they were used by other Federal organizations.

Federal program output measures, for the most part, are physical counts or quantities of the services produced.⁵ Unlike the situation in the private sector, where there are streams of prices and revenues, it is not possible to measure government output (with the possible exception of the enterprise services) using a deflated-value technique (in which revenue is divided by price to yield a quantity measure).

Another troublesome issue in measuring government productivity is whether the measures should focus on government outcomes or outputs.⁶ Outcomes are the results of government operations, whereas outputs are what is produced. For example, the outcome of a job training program might be the wages that the participants earn once they finish training, while the output of the program would be the number of individuals trained. The focus of the Federal Productivity Measurement Program is solely on final outputs.

A large number of different output indicators were used in developing Federal measurements. While the precise number of measures varied by year, the 1994 calculations combined more than 2,500 different indicators, including such diverse items as inspections conducted, licenses processed, claims paid, kilowatthours generated, outpatient visits conducted, and money orders sold. (See exhibit 1 for additional examples.) The volume counts for each indicator ranged from a few dozen in the case of inspector general audits to billions in the case of mail deliveries.

Federal organizations were encouraged to measure as many final activities as possible, and most organizations presented five or more outputs. For those units that produced multiple outputs, it was necessary to aggregate the individual activities to create a single organizational output index.

Modern production theory indicates that revenue weights should be used to aggregate outputs. Alternatively, under certain assumptions, cost weights can be used. However, for most Federal outputs, appropriate revenue or cost data are not available. Federal program calculations used labor weights because of their ready availability and because of the close correlation between labor weights and cost weights.

The procedure used to make the calculations was to apply fixed, base-year labor weights—specifically, unit labor requirements—to each output activity and sum the results. The weights were updated every 5 years, and the 5-year segments were linked to calculate the total index.⁷ The indexes were computed on a fiscal year basis.⁸

Exhibit 1. Sample output measures by function

<i>Audit of operations</i> Installation audits completed Pricing proposal audits Internal operations audited	<i>Library services</i> Circulation items loaned Reference questions answered Periodicals and new journals routed	<i>Procurement</i> Contract actions completed Line items purchased Purchase actions processed
<i>Buildings, grounds, and equipment maintenance</i> Acres of fine lawn maintained Average square feet cleaned Minor maintenance items repaired	<i>Loans and grants</i> Disaster loans approved Minority business grants issued Rehabilitation loan applications processed	<i>Records management</i> Records updated Archival information services provided Reference services completed
<i>Education and training</i> Flight training (student days) Student enrollment (continuing education) Participant training days	<i>Medical services</i> Medical care provided (weighted composite) Clinical visits made Outpatient visits conducted	<i>Regulation: compliance and enforcement</i> Cotton samples classified Inspections conducted Cattle herds tested for brucellosis
<i>Electric power production and distribution</i> Kilowatthours generated Megawatts sold	<i>Natural resources and environmental management</i> Miles of trails maintained Pounds of fish raised River basin studies completed	<i>Regulations: rulemaking and licensing</i> Trademark applications disposed Permits issued or reissued Licenses processed
<i>Finance and accounting</i> Invoices paid Insurance claims processed Domestic payroll accounts maintained	<i>Personnel investigations</i> Inspections conducted Clearances conducted Position sensitivity determinations made	<i>Social services and benefits</i> Compensation claims paid Hospital insurance claims processed SSI change of address made
<i>General support services</i> Mail items processed Graphic units produced Travelers serviced	<i>Personnel management</i> Retirement actions completed Incentive award forms completed Vacancies filled	<i>Specialized manufacturing</i> Munitions produced (equivalent units) Tons of fertilizer materials produced Millions of coins produced
<i>Information services</i> Regular reports prepared News releases published River stage forecasts made	<i>Postal service</i> Letters delivered by class of mail Express mail delivered Money orders sold	<i>Supply and inventory control</i> Line items processed Requisitions processed Short tons received and shipped
<i>Legal and judicial activities</i> Cases disposed Settlements and decisions rendered Appellate decisions entered	<i>Printing and duplication</i> Equivalent sheets printed Paper copies reproduced Offset printing impressions made	<i>Transportation and traffic management</i> Fleet miles operated Revenue ton-miles of freight and passengers carried Icebreaker support days provided

Federal program inputs and costs were restricted to labor and labor compensation. Employment indexes were developed for each organization. The indexes represent the number of full-time-equivalent employees and are based on an hours-paid equivalency of 2,087 hours per year. They include all paid time, vacations, holidays, and sick leave. Also, part-time and seasonal employment and overtime were included on a full-time-equivalency basis. All employee years are considered homogeneous and additive. The indexes do not reflect changes in the qualitative aspects of labor, such as skill and experience.

In the Federal Productivity Measurement Program, productivity was computed as output per employee year. The indexes of output per employee year relate the output of individual organizations to the labor required to produce the output. They do not measure the specific contribution of labor, capital, or any other factor of production. Rather, they reflect

the joint effect of many influences, including changes in technology, capital investment, capacity utilization, office design and layout, skill and effort of the work force, managerial ability, and Federal legislation and regulation.

Total compensation and average employee compensation indexes were computed for each organization measured. These indexes included employee wages and salaries, as well as benefits such as pensions, incentive pay, and health insurance. An index of unit labor cost, which reflects the index of compensation divided by the index of output, also was calculated for each organization.

For the purposes of presentation and analysis, the measures for the individual organizations (255 in 1994) were combined to create indexes for the total measured portion, the individual agencies, selected sectors, and 24 functions. Employee-year weights were applied to each organization's output to calculate the output trends for each special tabulation.

Most Federal agencies were included in the data base, but in some cases it was not possible to accommodate the entire organization. For example, only a small part of the Department of State was included. The decision whether to include an agency in the data base reflected the availability of organizational data, how well the conceptual questions concerning the measurement of the agency's output could be resolved, and the organization's willingness to participate. Because of this arrangement, the statistics presented in this article cannot be characterized as representative of the total Federal Government; rather, they must be viewed simply as reflecting the trends of the organizations that were measured.

Overall trends

Computations show that output per employee year for the measured part of the Federal Government increased at an average annual rate of 1.1 percent from 1967 to 1994. (See table 1.) However, the increase varied by period, with a dropoff starting in the mid-1980s. From 1967 to 1982, the average annual increase was 1.5 percent; from 1982 to 1994, the figure was 0.6 percent. During the latter period, the growth rate declined by 0.9 percentage point.⁹ The year-to-year changes in output per employee year ranged from an increase of 2.9 percent in 1977 to a decline of 2.8 percent in 1991. In each of 3 years—1974, 1989, and 1991—there were declines in output per employee year, and during 2 years—1984 and 1994—there was no change. (See chart 1.)

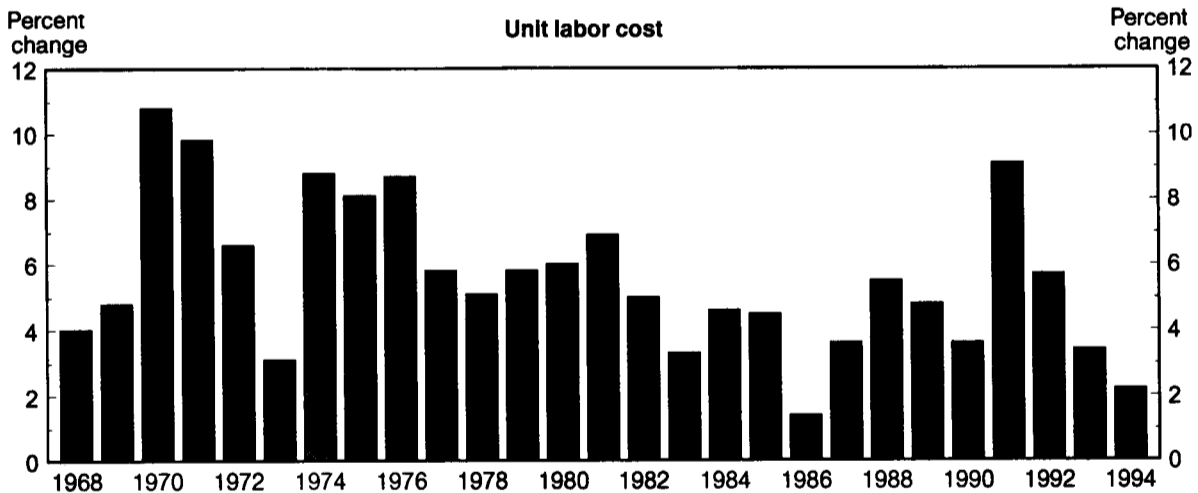
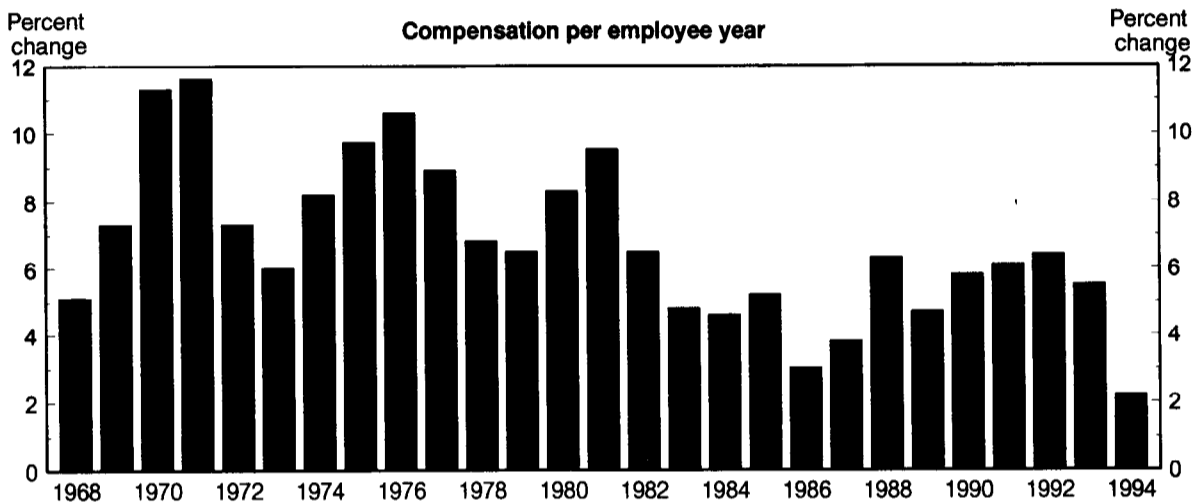
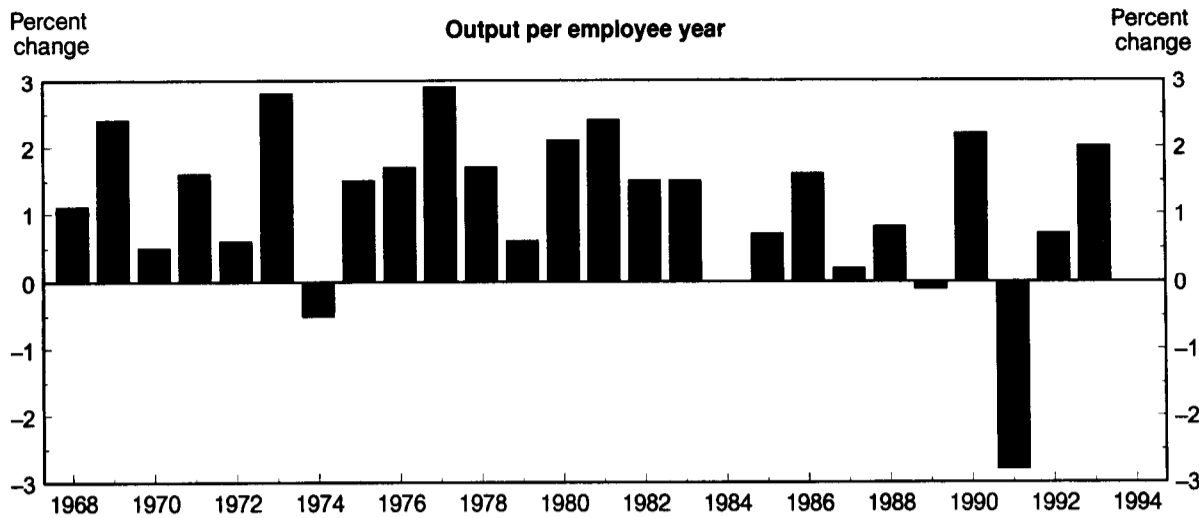
The overall increase in output per employee year between 1967 and 1994 reflects an average rise of

Table 1. Productivity indexes for total Federal sample, fiscal years 1967-94

[1967 = 100.0]

Fiscal year	Output per employee year	Output	Employee year	Compensation per employee year	Unit labor cost
1967	100.0	100.0	100.0	100.0	100.0
1968	101.0	103.8	102.6	104.8	104.0
1969	103.5	107.2	103.4	112.9	109.3
1970	103.9	107.5	103.2	125.4	121.1
1971	105.6	108.9	102.9	139.9	132.8
1972	106.3	109.1	102.5	150.4	141.5
1973	109.3	110.8	101.3	159.3	146.1
1974	108.7	111.0	102.0	172.2	158.8
1975	110.3	112.8	102.2	189.1	171.5
1976	112.3	113.8	101.2	208.9	186.7
1977	115.5	115.8	100.1	227.4	197.5
1978	117.5	118.4	100.8	243.1	207.4
1979	118.3	119.3	100.9	258.9	219.5
1980	120.8	122.8	101.6	280.2	232.5
1981	123.6	124.6	100.6	306.9	248.9
1982	125.5	126.0	100.4	327.0	261.3
1983	127.3	129.3	101.4	342.7	269.7
1984	127.3	132.1	103.6	358.5	282.0
1985	128.2	135.4	105.6	377.0	294.7
1986	130.3	138.7	106.4	388.3	298.8
1987	130.5	140.6	107.6	403.2	309.6
1988	131.6	142.1	108.0	428.6	326.6
1989	131.5	142.3	108.1	448.8	342.1
1990	134.3	145.6	108.3	475.0	354.2
1991	130.7	142.8	109.3	504.0	386.7
1992	131.6	144.6	109.7	536.3	408.7
1993	134.3	145.7	108.3	565.7	422.6
1994	134.3	147.1	109.4	578.2	431.9
Average annual rates of change (in percent)					
1967-94	1.1	1.4	.3	6.7	5.6
1967-82	1.5	1.6	.0	8.2	6.6
1982-94	.6	1.3	.7	4.9	4.3

Chart 1. Year-to-year changes in Federal Government productivity measures, fiscal years 1967-94



1.4 percent in output and 0.3 percent in employee years. Output increased every year except for 1991, but over the period measured, there was a slight decline in the rate of increase in output. The annual rate of change in employee years from 1967 to 1994 was fairly stable, although it ranged from a high of 2.6 percent in 1968 to a low of minus 1.3 percent in 1993. During 9 separate years, the measured labor force declined in numbers.

Compensation (that is, salaries, wages, and fringe benefits) per employee year increased every year. The average annual rate of change was 6.7 percent between 1967 and 1994, ranging from 11.6 percent (1971) to 2.2 percent (1994). As with the total economy, there was a diminution of the rate of increase in compensation over the period: from 1967 to 1982, the average annual increase was 8.2 percent; from 1982 to 1994, it was 4.9 percent.

Unit labor cost, which is total compensation divided by output, increased at an annual rate of 5.6 percent between 1967 and 1994, as output lagged increases in compensation. The largest increase was 10.8 percent in 1970, the smallest 1.4 percent in 1986. While unit labor cost increased every year, the rate of increase generally slowed through time. The average annual change from 1967 to 1982 was 6.6 percent, but from 1982 to 1994 it was 4.3 percent. The diminishing rate is a reflection primarily of smaller increases in compensation during the latter part of the period.¹⁰

Trends by type of measure

To better identify and understand the forces that affect Federal productivity, the organizations were divided into 24 functional groups based on the similarity of tasks performed. Indexes were calculated for output per employee year, output, employee years, compensation per employee year, and unit labor costs for each function. The functions, which include such diverse activities as auditing, medical services, personnel operations, and transportation, were developed to provide standards against which managers could compare their organizations' performance. (See table 2.)

The long-term trends of output per employee year between 1967 and 1994 for the 24 functions ranged from 3.8 percent per year for finance and accounting to -1.0 percent per year for electric power production and distribution. Most functions (21 of the 24) showed positive rates of growth over the long term. (See chart 2.)

Shifts in program emphasis and the delivery of Government services since the late 1960s are reflected in output trends. Output declined in about one-fifth (5 of 24) of the functions. Drops were

recorded by audit of operations, education and training, printing and duplication, records management, and supply and inventory control, most of which have an important defense component. Those functions which registered gains include regulation, legal activities, and social services, areas that have received increased attention over the past several decades. Long-term average annual functional output trends ranged from a rise of 4.7 percent for general support services to a decline of 2.2 percent for printing and duplication.

Changes in employment trends reflected changes in output, technology, contracting, laws, regulations, management, and a number of other factors. For the 24 functions measured, employment increased in 13, decreased in 10, and remained unchanged in 1. The long-term average annual employee-year trends ranged from 3.6 percent for legal and judicial activities to -2.9 percent for supply and inventory control.

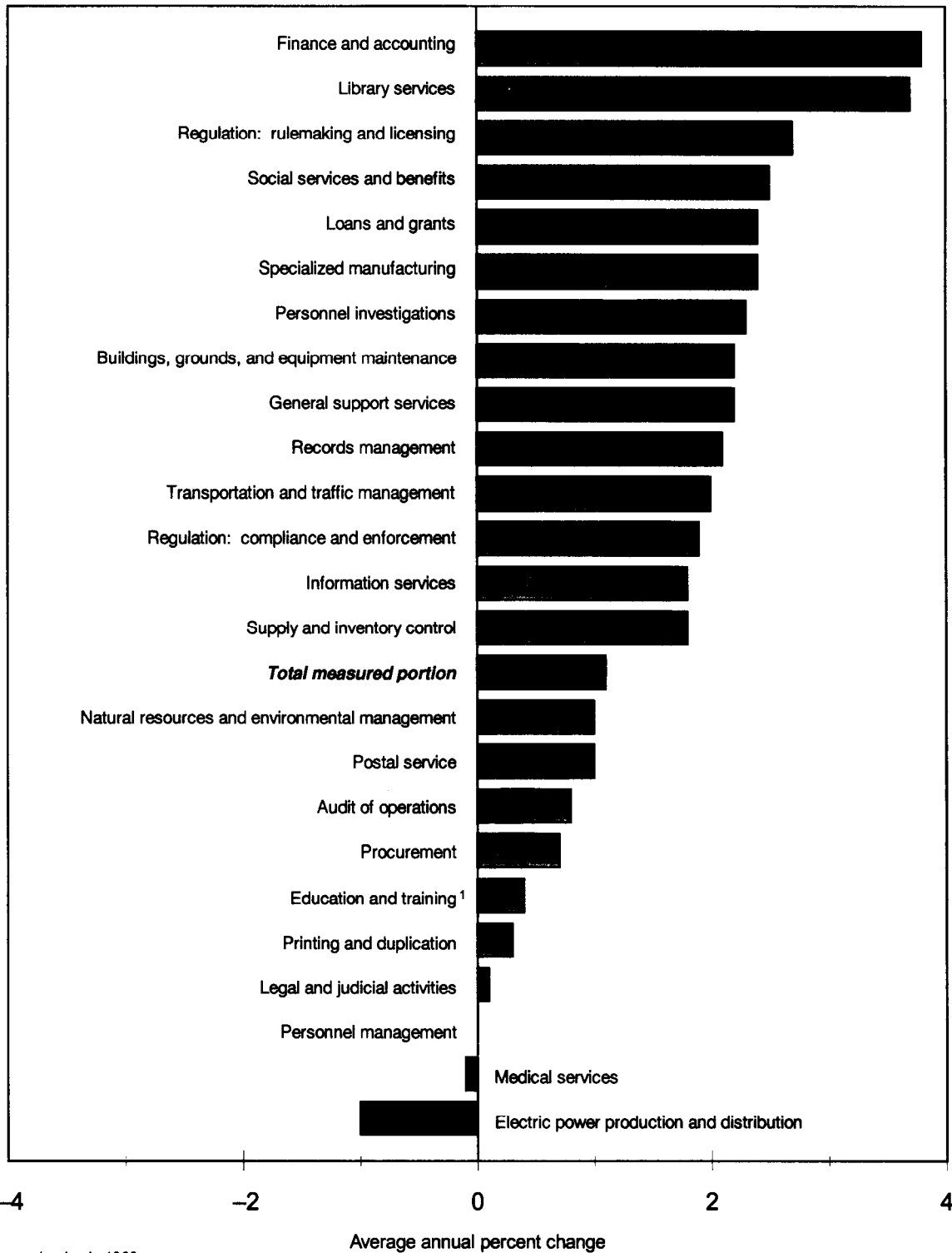
Trends in compensation per employee year tended to be fairly similar, because pay schedules and rate increases are

Table 2. Average annual rates of change in output per employee year and related data, by selected functions in the Federal civilian work force, fiscal years 1967-94

Function	Output per employee year	Output	Employee year	Compensation per employee year	Unit labor cost
Total Federal sample	1.1	1.4	0.3	6.7	5.6
Audit of operations .....	.8	-9	-1.7	6.2	5.4
Buildings, grounds, and equipment maintenance	2.2	1.0	-1.1	5.8	3.6
Education and training ¹ .....	.4	-1.0	-1.5	6.1	5.6
Electric power production and distribution	-1.0	.4	1.4	6.5	7.6
Finance and accounting	3.8	2.2	-1.5	6.3	2.4
General support services	2.2	4.7	2.5	5.6	3.4
Information services	1.8	1.9	.0	5.5	3.6
Legal and judicial activities .....	.1	3.7	3.6	6.0	5.9
Library services	3.7	4.6	.9	7.1	3.3
Loans and grants	2.4	2.7	.4	6.8	4.3
Medical services	-1	1.3	1.4	6.6	6.6
Natural resources and environmental management	1.0	.7	-4	6.0	4.9
Personnel investigations	2.3	3.5	1.2	6.8	4.4
Personnel management .....	.0	2.2	2.3	5.2	5.2
Postal service	1.0	1.9	.9	7.0	6.0
Printing and duplication .....	.3	-2.2	-2.4	6.3	6.1
Procurement .....	.7	.2	-4	4.9	4.2
Records management	2.1	-6	-2.6	6.3	4.1
Regulation: compliance and enforcement	1.9	3.9	2.0	6.5	4.5
Regulation: rulemaking and licensing	2.7	4.6	1.8	6.6	3.8
Social services and benefits	2.5	3.2	.7	6.7	4.1
Specialized manufacturing	2.4	.8	-1.5	6.8	4.3
Supply and inventory control	1.8	-1.1	-2.9	5.5	3.6
Transportation and traffic management	2.0	2.2	.1	7.1	5.0

¹ Beginning in 1968.

Chart 2. Average annual rates of change in output per employee year for the measured portion of the Federal Government, by function, fiscal years 1967-94



¹Measure begins in 1968.

NOTE: Average annual percent change uses compound rate formula.

uniform across most functions. The average annual increase from 1967 to 1994 ranged from 4.9 percent to 7.1 percent, with increases in the 6-percent range in most of the 24 functions. Even the postal service, which is characterized by union bargaining over pay and fringe benefits, showed compensation increases of only 7.0 percent per year.

Because of the relative homogeneity in growth in compensation, those functions that had more rapid advances in output per employee year generally registered slower increases in unit labor costs. Finance and accounting, which had the largest rate of increase in output per employee year, had the smallest rate of increase in unit labor costs (2.4 percent per year) from 1967 to 1994. At the other extreme, electric power, which had the largest drop in output per employee year (1.0 percent, on average) had the largest increase (7.6 percent, on average) in unit labor costs of the 24 functions.

Productivity trends by function

The productivity movements of individual functions varied from year to year—quite dramatically for a few functions. The electric power production and distribution function registered large year-to-year fluctuations and rapid reversals in its trends. Between 1967 and 1972, productivity in this function increased at an average annual rate of 5.6 percent; between 1972 and 1987, it *decreased* at an average rate of 6.1 percent per year; and between 1987 and 1994, it increased annually at 6.0 percent. In more than half the measured years, output changed by more than 10 percent; in 1978 it jumped by 23 percent, and in 1982 it dropped by 35 percent. These fluctuations resulted from oil embargoes, recessions, delays and cutbacks in nuclear power production, and droughts that cut hydroelectric production of electricity. While the year-to-year fluctuations in employment were less dramatic, there were 10 years in which fluctuations reached 10 or more percent, a highly unusual situation for Government programs. Furthermore, employment in the electric power function dropped every year between 1988 and 1994, with an average annual decrease of 5.8 percent. The decline in employment was the driving force behind the increase in output per employee year in recent years.

Several of the functions dominated by the Department of Defense registered large year-to-year fluctuations in response to international events. For example, the education and training function registered nearly an 18-percent drop in output in 1991, as military training was greatly reduced when U.S. forces were moved to the Middle East; concurrently, productivity fell by 14 percent.

In finance and accounting, which recorded the highest long-term increase in output per employee year, productivity grew in 21 of the years between 1967 and 1994. Output also increased steadily (expanding in 18 of the 27 years), although

modestly—2.2 percent annually—over the long term. Meanwhile, labor inputs dropped at an annual rate of 1.5 percent. This was made possible by the implementation of new accounting systems and the massive automation of operations such as the electronic transfer of funds and deposit of payroll checks.

The library function is another area in which technological improvements and employee cutbacks had a major impact on productivity. This function showed the second-largest average annual increase in output per employee year (3.7 percent) between 1967 and 1994. Federal agencies have automated library operations and cut the number of their employees, and some of the smaller library operations have been contracted out, particularly since the mid-1980s. From 1967 to 1982, employee years increased at an annual rate of 2.8 percent, but from 1982 to 1994, they decreased 1.3 percent per year.

The printing and duplication function contained only five organizations in 1994; in 1983, there were 16. In this function, both output and input decreased between 1967 and 1994. A fairly steady drop in output (2.2 percent per year) occurred throughout the measured period as Federal agencies cut back the number of documents published, turned to electronic publishing, increasingly relied on self-service copy centers, and contracted for services. In response to the drop in output, employment was reduced (by 2.4 percent per year). The reductions in output and employment resulted in little change in output per employee year over the long term.

Factors behind the changes

The indexes of output, employment, and output per employee year measured by the Federal Productivity Measurement Program were shaped by a variety of factors, forces, and actions. At times, change came from management action, as in the case of the introduction of the computer, restructuring of work processes, or automation of activities. At other times, it was due to external forces such as hurricanes, floods, earthquakes, legislation, and court decisions. But in most instances, change resulted from some combination or interplay of internal and external considerations.

From the inception of the Federal Productivity Measurement Program until 1987, Federal managers were queried on the reasons for the changes in output per employee year in their programs. Not every agency responded every year, but most did, particularly in the early years. For several reasons, including the qualitative nature of the responses, the problem in attributing change to specific causes, the lack of systematic data collection instruments, and the absence of independent verification of the reasons, it is not possible to draw definitive conclusions from these data. But many of the reasons for the changes were noted time and again by agency personnel, and taken together, they form definite patterns.

The most thorough and systematic analysis of the reasons underlying the changes in output per employee year comes from an examination of the 1967–72 data.¹¹ The study shows that the reason given most frequently for a change in output per employee year was a change in the output; that is, the managers noted that the index of output per employee year was driven most often by a change in workload. Sometimes this resulted from a change in Federal legislation (as in the case of the rapid growth of medicare and medicaid), the reductions in force following the Vietnam war (procurement actions dropped dramatically), and even the weather (cold weather prompted an early start in Coast Guard icebreaking operations one year). Other factors that were frequently mentioned included automation, capital investment, and improvements in systems and methods. The computer was often cited as being the driving force behind the increasing output per employee year.

Data for the period from 1981 to 1986, the last years for which the explanatory responses from the study are available, are sparse. But the conclusions are similar to those for the 1967–72 period:¹² two factors, the change in the workload and automation-capital investment, ranked first and second, and together they accounted for almost three-quarters of the reasons given by managers for the change in output per employee year. The 1981–86 period was one of rapid office automation and the introduction of computers into the financial arena.

The Department of Treasury moved to the electronic transfer of payments, the statistical agencies (the Census Bureau, the Bureau of Labor Statistics, and the Bureau of Economic Analysis) turned to the personal computer, and the State Department automated much of its finances and introduced the machine-readable passport. In addition, the Bureau of Engraving and Printing, the Mint, and the Government Printing Office installed new equipment. The workload increased for the Railroad Retirement Board because of new legislation, dropped for the Panama Canal because of the opening of an oil pipeline, and declined for the Bureau of Land Management because of the recession and the ensuing cutback in timber purchases.

After 1986, reasons for the change in output per employee year were not collected, but agency personnel were asked to explain the reason for any change in outputs or employee years of more than 10 percent in a single year. A tabulation of these responses for the 1990–94 period showed that in two-thirds of the cases, a change in outputs was a direct result of a change in the workload. As in the earlier surveys, a variety of reasons were given for the changes in workload: hurricanes and earthquakes, in the case of the Federal Emergency Management Agency; the Persian Gulf War in the case of the Maritime Administration; an increase in bankruptcies in the case of the Pension Benefit Guarantee Corporation; and a change in postal

rates in the case of the postal service, among others. Employment cuts and freezes on hiring were most often mentioned as the reasons for a decrease in employee years.

Federal-private sector comparisons

The comparison of productivity trends in the Federal Government with those in the private sector was a concern of those who established the Federal Productivity Measurement Program since its inception in the 1970s. With today's interest in downsizing employment and reducing Federal Government services, comparisons of the Federal and private sectors continue to be of interest. Comparative analyses can be informative and helpful to managers and policymakers.

The aggregate comparison presented here is of the total nonfarm business sector and the measured portion of the Federal Government. Such a comparison raises several conceptual concerns. First, the nonfarm business sector output index is a measure of the preponderant portion of nonfarm business net output in the United States, while the Federal output index is a measure of gross output.¹³ Moreover, the Federal index is based on a nonrandom sample because of the nonresponse of some organizations each year. Second, the output mix is quite different: nonfarm business output reflects both goods and services, whereas the Federal Government output comprises mostly services. Third, nonfarm business outputs reflect final outputs from the perspective of the nonfarm business sector, while the Federal outputs measure both final Federal outputs (that is, those consumed by the public) and intermediate outputs (that is, those consumed within the Federal Government, such as personnel operations).¹⁴ Fourth, the nonfarm business sector indexes are based on changing-weight indexes, whereas the Federal Government's indexes, as mentioned earlier, are base-year weighted. And finally, the Federal Government indexes reflect the Federal fiscal year, while the nonfarm business indexes are based on the calendar year.

With these limitations in mind, it is interesting to note that, between 1967 and 1994, both Federal and nonfarm business productivity grew at modest rates. Productivity advanced by 1.1 percent per year in the measured portion of the Federal Government and by 1.4 percent in the nonfarm business sector. However, the rates do vary by period: nonfarm business and Federal Government productivity increased at the same rate, 1.5 percent, between 1967 and 1982, but, as noted earlier, the Federal Government's rate of productivity growth slowed over the latter part of the measured period, so that from 1982 to 1994, the average annual increase was 0.6 percent, while nonfarm business growth was 1.3 percent.

FOR MORE THAN A QUARTER OF A CENTURY, productivity statistics were collected and published on Federal Government operations. These statistics suggest the following:

1. There was a small, but steady, increase in Federal Government output per employee year between 1967 and 1994.

2. There was a dropoff in the rate of increase in output per employee year of the Federal Government beginning in the mid-1980s.

3. When the Federal Government productivity data are separated and examined by major function, different trends—indeed, sometimes dramatically different trends—are seen.

4. The overall average annual increase in productivity of the Federal Government approximated that of nonfarm busi-

ness between 1967 and 1982, but lagged behind it from 1982 to 1994; however, the different approaches to the measurement of productivity in the two sectors of the economy dictate caution in these comparisons.

5. Many of the economic and technical forces that shaped nonfarm business sector productivity, such as oil embargoes, weather disturbances, the automation of communication, and the computer revolution, affected Federal Government operations and productivity. Thus, it is not especially surprising to encounter similar long-term productivity trends in the two sectors. □

Footnotes

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¹ *Measuring and Enhancing Productivity in the Federal Sector* (U.S. Congress, Joint Economic Committee, 1972); and *Federal Productivity*, Hearings before the Subcommittee on Priorities and Economy in Government, Dec. 17 and 18, 1973 (U.S. Congress, Joint Economic Committee, 1974).

² "Productivity Measurement as a Tool in Federal Management Improvement," Statement of Charles W. Ardolini before U.S. Senate Subcommittee on Civil Service, Post Office, and General Service of the Committee on Governmental Affairs, Sept. 19, 1984.

³ *Productivity Statistics for Federal Government Functions, Fiscal Years 1967-94*, Report 906 (Bureau of Labor Statistics, March 1996), p. 6.

⁴ Much of this discussion in this section was taken from Edwin R. Dean, "Accounting for Productivity Change in Government," in *A BLS Reader on Productivity*, Bulletin 2474 (Bureau of Labor Statistics, 1996), pp. 164-73.

⁵ "Productivity Measures: Industries and Government," *BLS Handbook of Methods*, Bulletin 2414 (Bureau of Labor Statistics, 1992), pp. 89-98.

⁶ This is also an issue in measuring the productivity of some private sector services, such as medical, educational, and recreational services.

⁷ The same basic approach was used to calculate private sector industry outputs until quite recently, when the procedure was shifted to annual weighting. See Kent Kunze, Mary Jablonski, and Virginia Klarquist, "BLS modernizes industry labor productivity program," *Monthly Labor Review*, July 1995, pp. 3-12.

⁸ Through fiscal 1976, the fiscal year was July 1-June 30; beginning with

fiscal 1977, the period was shifted to October 1-September 30. Data for the "transition quarter" of July 1-September 30, 1976, are excluded from all indexes.

⁹ We have picked 1982, which is a base year, as the point to divide the index; the dropoff in productivity growth would have been the same if the next base year, 1987, had been chosen.

¹⁰ The indexes of compensation per employee year and of unit labor cost are not adjusted for inflation. The Consumer Price Index for All Urban Consumers rose at an average annual rate of 5.7 percent between 1967 and 1994.

¹¹ "Case Studies in Federal Productivity Change: FY 1967-1972," November 1973, one of five special reports prepared by a joint Civil Service Commission/General Accounting Office/Office of Management and Budget study group as a supplement to *Measuring and Enhancing Productivity in the Federal Sector* (U.S. Congress, Joint Economic Committee, 1972).

¹² The 1967-72 managerial responses were for the entire period, whereas the 1981-86 responses were annual answers.

¹³ Nonfarm business does not account for all of the private sector; it excludes nonprofit organizations, private households, farms, and owner-occupied housing. Also, the nonfarm business sector includes government enterprises.

¹⁴ The Federal data indexes were computed for the total data set and for a subset that excluded intermediate organizations, Federal Government enterprises, and the Department of Defense for fiscal 1987-91. The results of these computations showed an annual productivity growth of 0.2 percent for the full data set and a decline of 0.4 percent with the exclusions. (See Dean, "Accounting for Productivity Change," p. 171.)