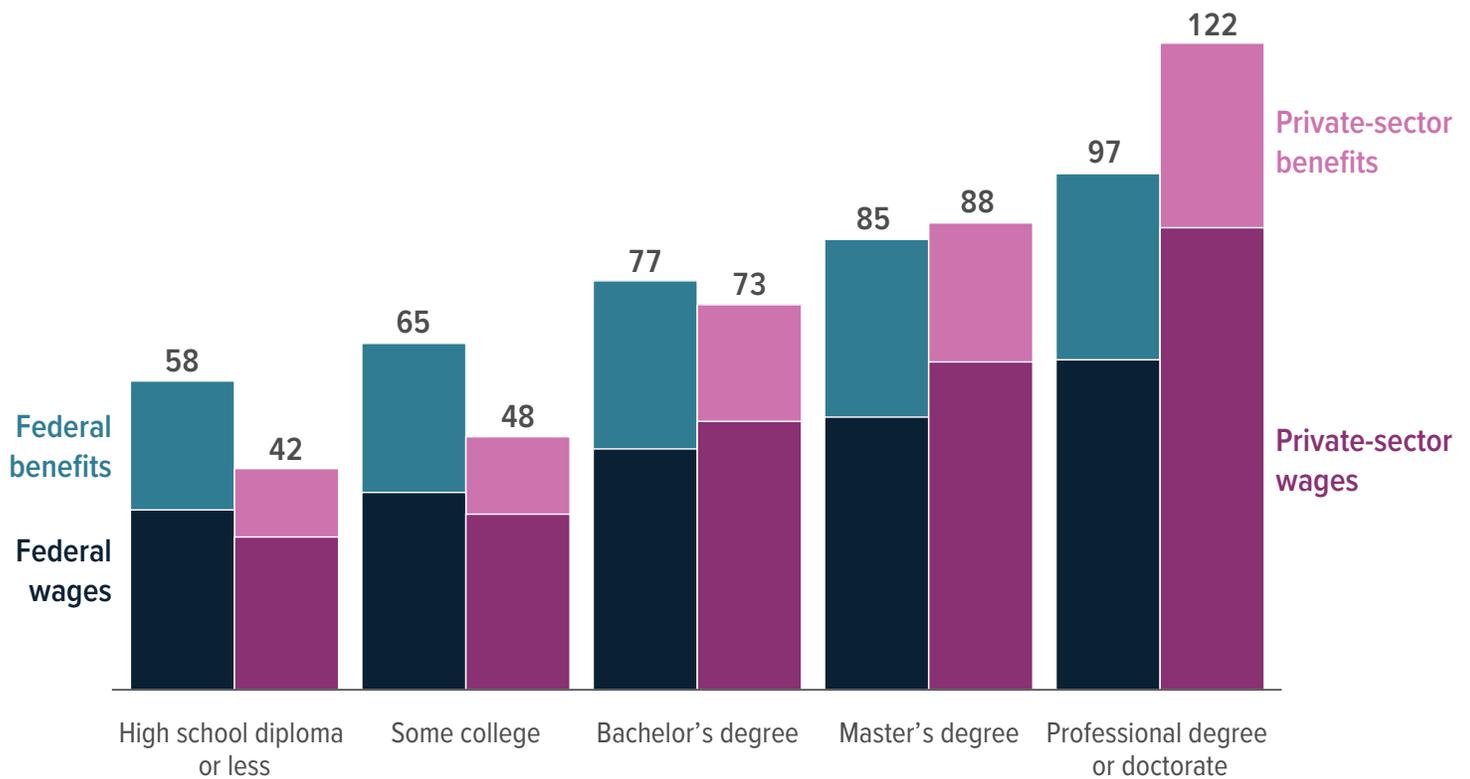




Comparing the Compensation of Federal and Private-Sector Employees in 2022



Average compensation, in dollars per hour, 2022

At a Glance

In this report, the Congressional Budget Office compares the cost that the federal government incurred in 2022 for the wages and benefits of its civilian employees with the cost that private employers incurred for employees who appear similar in their educational attainment and other observable characteristics likely to affect wages.

- **Wages.** For federal civilian workers whose highest level of education was a bachelor's degree or more, the cost of wages in 2022 was less, on average, than the cost for private-sector workers with similar observable characteristics. Among workers with less education, federal workers' wages cost more than those of their counterparts in the private sector, on average.
- **Benefits.** For employees at most levels of educational attainment, the cost of federal benefits—including retirement benefits and paid leave—exceeded the cost of benefits for their private-sector counterparts in 2022. Those differences in benefits were smaller for workers with more education.
- **Total compensation.** For federal workers whose highest level of education was a master's degree or more, the cost of total compensation (the sum of wages and benefits) was less, on average, than the cost for their counterparts in the private sector. For workers with less education, the government spent more on total compensation than it would have if average compensation had been comparable with that in the private sector, after accounting for certain observable characteristics.
- **Comparison with the findings in CBO's 2017 report.** CBO's previous comparison of federal and private-sector compensation covered the period from 2011 to 2015. By 2022, federal compensation had declined relative to private-sector compensation, primarily because lawmakers enacted across-the-board salary increases for federal employees that were smaller than wage growth in the private sector.
- **Other job attributes that affect recruitment and retention.** Job security, deferred compensation, and the flexibility to work from home are other job attributes that workers may value. By offering more of those job attributes, the federal government and private-sector employers can recruit and retain a highly qualified workforce while spending less on wages and benefits. Federal employment offers more security than many jobs in the private sector, making federal employment more attractive for workers. But a greater share of federal compensation is deferred until retirement, which many workers find less valuable than wages. Federal employees and their private-sector counterparts teleworked at roughly similar rates in 2022.

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Notes About This Report

Numbers in the text, tables, and figures may not add up to totals because of rounding. For the same reason, the percentage differences shown in some of the tables may not correspond precisely to the dollar amounts shown.

Unless otherwise indicated, all years in this report are calendar years and the numbers in the tables and figures apply to full-time, full-year workers.

Wages, benefits, and total compensation in this report were converted to 2022 dollars using the employment cost index.

Summary

The federal government employs about 2.3 million civilian workers—or 1.4 percent of the U.S. workforce—in jobs that represent over 650 occupations at more than 100 agencies. It competes with private-sector employers for people who possess the mix of attributes needed to do the work of its various agencies.

In fiscal year 2022, the federal government spent roughly \$271 billion to compensate those civilian employees. About 60 percent of that total was spent on civilian personnel working in the Department of Defense, the Department of Veterans Affairs, and the Department of Homeland Security.

Compared with private-sector workers, federal workers tend to be older, more educated, and more concentrated in professional occupations. To account for those differences, the Congressional Budget Office limited its comparisons to employees with a set of similar observable characteristics—education, occupation, years of work experience, geographic location, size of employer, veteran status, and certain demographic characteristics (sex, race, ethnicity, marital status, immigration status, and citizenship)—in this report.

Even so, the estimates do not show precisely what federal workers would earn if they were employed in comparable positions in the private sector. Even among workers with similar observable characteristics, federal and private-sector employees may differ in other traits, such as motivation or natural ability, that are not easy to measure but that can greatly affect individuals' compensation.

This analysis focuses on wages, benefits, and total compensation (the sum of wages and benefits). It is intended to address the question of how the federal government's compensation costs would change if the average cost of employing federal workers was the same as that of employing private-sector workers with certain similar observable characteristics (the benchmark group). This analysis looks at compensation in 2022 because the temporary effects of the coronavirus pandemic on the federal

and private-sector workforces had largely subsided by then.

Comparison of Wages

In 2022, the difference between the wages of federal civilian employees and those of similar private-sector employees varied widely—as they have in previous years—depending on the employees' educational attainment.

- Federal workers with no more than a high school education—about 13 percent of the federal workforce—earned about 17 percent more, on average, than their private-sector counterparts.
- Federal workers whose education culminated in a bachelor's degree—about one-third of the federal workforce—earned about 10 percent less, on average, than similar workers in the private sector.
- Federal workers with a professional degree or doctorate—about 10 percent of the federal workforce—earned about 29 percent less, on average, than their private-sector counterparts (see Figure S-1).

Overall, the federal government would have spent about 10 percent more on wages if it had adjusted the pay of its employees to match the wages of their private-sector counterparts.

The span between the wages of the highest- and lowest-earning employees was narrower in the federal government than in the private sector in 2022, even after accounting for employees' education and other observable traits. The narrower dispersion of wages among federal employees may reflect the constraints of federal pay systems, which limit the pay of managers and make it harder for managers to reward the best performers or limit the compensation of the worst performers.

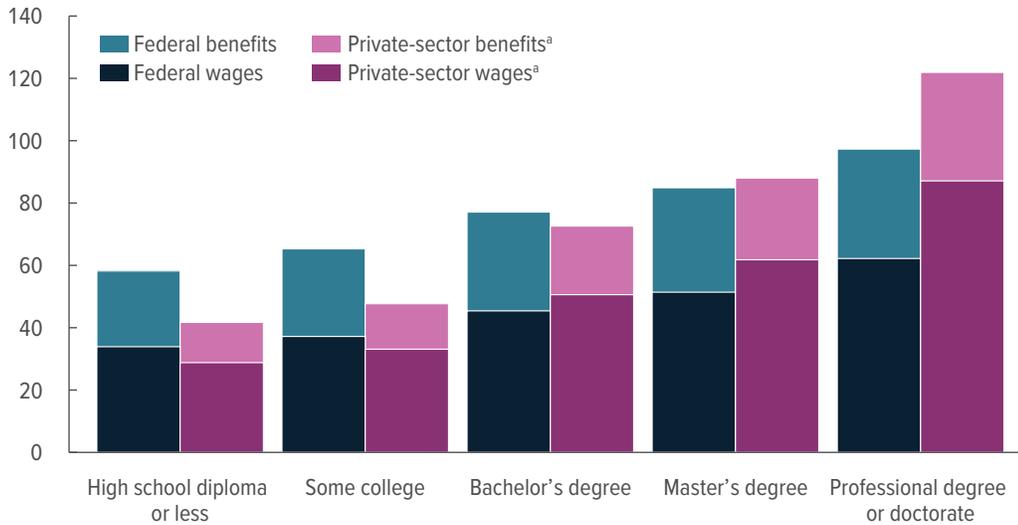
Comparison of Benefits

Noncash benefits, such as health insurance, retirement income, and paid leave, represent a sizable portion of compensation for workers. On average, the cost of benefits for workers at all levels of education was

Figure S-1.

Average Compensation of Federal and Private-Sector Workers, by Educational Attainment, 2022

Dollars per hour



For federal workers with more education, the government spent less on total compensation than it would have if average compensation had been comparable with that in the private sector. For federal workers with less education, the cost of total compensation was more, on average, than the cost for their counterparts in the private sector.

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA; Office of Personnel Management; Bureau of Labor Statistics. See www.cbo.gov/publication/59970#data.

Wages are measured as an average hourly wage rate and include overtime pay, tips, commissions, and bonuses. Benefits are measured as the average cost, per hour worked, that an employer incurs in providing noncash compensation. The average benefits shown here are for workers at firms that employ at least 1,000 people.

a. Average wages and benefits for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

43 percent higher for federal civilian employees than for private-sector employees with certain similar observable characteristics, CBO estimates.

Among workers with a master's degree or less education, the cost of federal benefits exceeded the cost of benefits for their private-sector counterparts in 2022. The differences in benefits narrowed as workers attained successively higher levels of education (see Table S-1). The most important factor contributing to federal workers' larger benefits is the retirement income they will receive if they remain in federal employment for enough years.

CBO's estimates of the costs of benefits are much more uncertain than its estimates of wages, primarily because most retirement benefits will be paid in the future and because less-detailed data are available about benefits than about wages.

Comparison of Total Compensation

As with its components (wages and benefits), total compensation for workers in both sectors differed by varying

degrees in 2022 depending on those workers' educational attainment.

- Among workers with a high school diploma or less education, total compensation costs averaged 40 percent more for federal employees than for their private-sector counterparts.
- Among workers whose education culminated in a bachelor's degree, the cost of total compensation averaged 5 percent more for federal workers than for similar workers in the private sector.
- Among workers with a professional degree or doctorate, by contrast, total compensation costs were 22 percent lower for federal employees than for similar private-sector employees, on average.

Overall, the federal government would have decreased its spending on total compensation by 5 percent if it had adjusted the cost of pay for its employees to match the compensation of their private-sector counterparts.

Table S-1.

Differences in Average Hourly Compensation Between Federal and Private-Sector Workers, by Educational Attainment, 2022

	Difference in 2022 dollars per hour			Percentage difference		
	Wages	Benefits	Total compensation ^a	Wages	Benefits	Total compensation ^a
High school diploma or less	5	12	17	17	88	40
Bachelor's degree	-5	10	5	-10	44	5
Professional degree or doctorate	-25	0	-25	-29	1	-22

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA; Office of Personnel Management; Bureau of Labor Statistics. See www.cbo.gov/publication/59970#data.

CBO compared average hourly compensation (wages, benefits, and total compensation) for federal civilian workers and for private-sector workers with certain similar observable characteristics that affect compensation—including occupation, years of experience, and size of employer—by the highest level of education that workers attained.

Positive numbers indicate that, on average, wages, benefits, or total compensation was higher in 2022 for federal employees than for similar private-sector employees. Negative numbers indicate the opposite.

a. Average compensation for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

Comparison With CBO's Previous Analysis of Compensation

CBO's last comparison of compensation in the two sectors covered the years from 2011 to 2015. By 2022, the extent to which federal pay exceeded private-sector pay for workers with less education had narrowed, and the pay of federal workers with more education had fallen further short of that of their counterparts in the private sector.¹ Those changes occurred because federal compensation grew less than private-sector compensation between those two periods. (Both analyses used broadly similar approaches.)

Federal compensation declined relative to private-sector compensation primarily because the across-the-board salary increases for federal employees that lawmakers enacted were smaller than wage growth in the private sector. Slower salary growth for federal workers held down growth in the cost of benefits because the costs of pensions, paid leave, and legally required benefits are closely tied to salaries.

Other Job Attributes That Can Affect Recruitment and Retention

When searching for a job, most workers are willing to accept lower wages and smaller benefits if the job offers other attributes that they value. Those attributes include job security, an appealing mix of up-front and deferred compensation, and the flexibility to work from home. Employers who offer more of those can spend less on wages and benefits and still recruit and retain a highly qualified workforce. The importance of those attributes to workers' employment decisions led CBO to examine them qualitatively in this analysis.

Workers value job security, and federal employment offers more of it than many jobs in the private sector. Conversely, a greater share of federal compensation is deferred until retirement, which many workers find less valuable than wages. Workers also value the option to work from home; federal employees and their private-sector counterparts teleworked at roughly similar rates in 2022.

1. Congressional Budget Office, *Comparing the Compensation of Federal and Private-Sector Employees, 2011 to 2015* (August 2017), www.cbo.gov/publication/52637.

Chapter 1: The Federal Workforce and How CBO Compares Its Compensation With That of the Private Sector

For the past 35 years, the number of civilians employed by the federal government has hovered around 2 million (see Figure 1-1). During that period, federal employees have accounted for a declining share of the total U.S. workforce because employment by the private sector and by state and local governments has grown along with the economy. In 1992, when about 94 million people worked in the private sector and 16 million worked for state or local governments, federal employees made up 1.9 percent of the workforce. By 2022, private-sector employment had reached 134 million and employment by state and local governments had reached 19 million. As a result, federal civilian employees accounted for 1.4 percent of the workforce in that year. In this analysis, the Congressional Budget Office evaluates the compensation of federal employees by comparing it with what similar workers make in the private sector (the benchmark group).

The Federal Workforce

In 2022, the federal government employed about 2.3 million workers (not counting military personnel or employees of the Postal Service) across a wide variety of departments, agencies, and occupations. Those workers receive compensation in the form of wages and benefits, such as health insurance and pensions, at a total cost to the government of about \$271 billion in fiscal year 2022. About 60 percent of that amount is spent on the three departments that employ the most workers: Defense, Veterans Affairs, and Homeland Security.

Types of Federal Workers

Besides federal civilian workers, who are the focus of this analysis, the government directly or indirectly employs other people to provide various services. In particular, the armed services include about 2.1 million uniformed personnel, about 1 million of whom are reservists. (CBO has analyzed the compensation of military personnel in

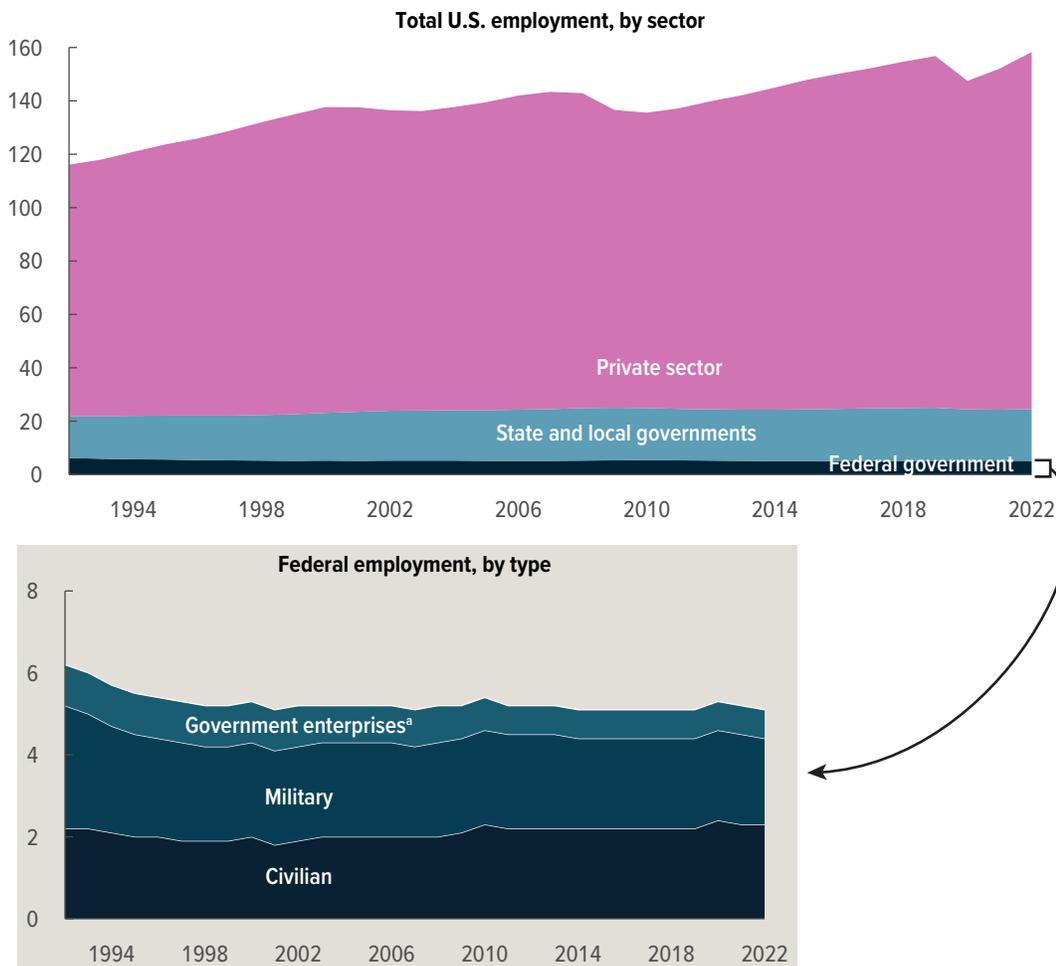
several publications.)¹ In addition, about 700,000 people work for government enterprises that typically pay for their employees' compensation through the sale of services rather than through tax revenues. (By far the largest government enterprise in terms of employment is the Postal Service.) Finally, because the federal government uses the private sector to carry out some of its functions, a number of private-sector employees work under contract to the federal government but have their compensation set by their employer.² This analysis does not include military personnel or employees of self-financing government enterprises such as the Postal Service; federal contractors are included as private-sector workers.³

1. For a comparison of military and private-sector compensation, see Congressional Budget Office, *Atlas of Military Compensation* (December 2023), www.cbo.gov/publication/59475, and *Approaches to Changing Military Compensation* (January 2020), www.cbo.gov/publication/55648. CBO compared military compensation with federal civilian compensation in Congressional Budget Office, *Analysis of Federal Civilian and Military Compensation* (attachment to a letter to the Honorable Steny H. Hoyer, January 20, 2011), www.cbo.gov/publication/22002.
2. The number of federal contractors is estimated in Paul C. Light, "The True Size of Government Is Nearing a Record High" (Brookings Institution, October 7, 2020), <https://tinyurl.com/8w36er2k>. Spending on federal contractors is tabulated in Congressional Budget Office, *Federal Contracts and the Contracted Workforce* (March 2015), www.cbo.gov/publication/49931. The compensation of federal contractors is discussed in Project on Government Oversight, *Bad Business: Billions of Taxpayer Dollars Wasted on Hiring Contractors* (POGO, 2011), www.pogo.org/our-work/reports/2011/co-gp-20110913.html. In addition to federal contractors, the government supports the jobs of other private-sector employees by purchasing goods and services produced by private firms. For example, the government buys computers and office supplies from companies in the private sector.
3. Collective bargaining agreements govern the pay of most Postal Service employees. Most other federal employees are not covered by such agreements.

Figure 1-1.

Trends in Government and Private-Sector Employment Since 1992

Millions of people



For the past 35 years, the number of civilians employed by the federal government has hovered around 2 million. During that period, federal employees have accounted for a declining share of the total U.S. workforce because employment by the private sector and by state and local governments has grown along with the economy. Besides the 2.3 million federal civilian workers, who are the focus of this analysis, the government employed 2.1 million military personnel in 2022, and about 700,000 people worked for government enterprises.

Data sources: Congressional Budget Office; national income and product accounts. See www.cbo.gov/publication/59970#data.

This figure includes employees who worked part time or part of the year.

a. Government enterprises are federal entities that typically fund their operating costs, including employees' compensation, through the sale of services rather than through tax revenues. By far the largest government enterprise in terms of employment is the Postal Service.

Federal Agencies and Occupations

Federal civilian employees perform a broad range of tasks in more than 650 occupations. Although federal workers are employed by more than 100 departments and agencies, 62 percent of them work at three departments in the executive branch (see Figure 1-2).

- The Department of Defense employs 34 percent of the federal civilian workforce. Those employees work in hundreds of different occupations, but the most common are information technology worker, program analyst, and contract manager.
- The Department of Veterans Affairs employs 19 percent of the federal civilian workforce. Because that department operates roughly 1,300 health care facilities for veterans, about 60 percent of its employees work in various medical professions, the most common of which is nursing.
- The Department of Homeland Security employs 9 percent of the federal civilian workforce. The most common job in that department is inspector for the Transportation Security Administration, which accounts for 22 percent of the department's employees.

Figure 1-2.

Federal Civilian Employment, by Branch and Department, 2022

Percent



Data sources: Congressional Budget Office; Office of Personnel Management. See www.cbo.gov/publication/59970#data.

This figure includes federal employees who work part time or part of the year. It excludes military personnel (who account for roughly the same number as federal civilian employees) and employees of government enterprises, such as the Postal Service. It also excludes employees of the Central Intelligence Agency, the National Security Agency, the Defense Intelligence Agency, and the National Imagery and Mapping Agency.

HHS = Department of Health and Human Services; SSA = Social Security Administration.

An additional 35 percent of federal employees work for the other departments and agencies of the executive branch. The most common occupations among those workers are information technology worker, program analyst, and contact representative (mostly workers who respond to public queries for the Internal Revenue Service and Social Security Administration). The remaining 3 percent of the federal workforce is employed by the legislative and judicial branches of government.

Differences Between the Federal and Private-Sector Workforces

Various characteristics of employees are likely to influence their compensation, regardless of employer. The federal and private-sector workforces differ in several significant ways that CBO incorporates into its comparison of compensation between the two sectors.

Differences by Occupation, Age, Education, and Location

Workers in the federal government and the private sector have different characteristics. In terms of occupation, a

larger percentage of federal employees work in professional occupations, such as the sciences or engineering, compared with private-sector employees (37 percent and 23 percent, respectively). In contrast, 24 percent of private-sector employees work in occupations such as sales, production, or transportation, compared with 6 percent of federal employees (see Table 1-1).

In general, professional occupations require more formal training or experience than do the occupations more common in the private sector. Partly because of that difference, the average age of federal employees is substantially higher than that of private-sector employees (46 versus 41).

The greater concentration of federal workers in professional occupations also means that they are more likely to have a bachelor's degree: 66 percent of the federal workforce has at least that much education, compared with 43 percent of the private-sector workforce (see Figure 1-3). Likewise, 33 percent of federal employees have a master's degree, professional degree (such as a law

Table 1-1.

Characteristics of the Federal and Private-Sector Workforces, 2022

Percentage of workforce

	Federal government	Private sector
Highest educational attainment		
High school diploma or less	13	33
Some college	21	26
Bachelor's degree	33	28
Master's degree	23	11
Professional degree or doctorate	10	4
Total	100	100
Occupation		
Management, business, and financial	31	22
Professional	37	23
Service	11	11
Sales	1	9
Administrative or office support	10	10
Farming, fishing, and forestry	-	1
Construction and extraction	2	5
Installation, maintenance, and repair	2	4
Production	3	7
Transportation	2	8
Total	100	100
Size of employer, by number of workers		
Fewer than 10	*	10
10 to 99	1	23
100 to 499	*	14
500 to 999	*	7
1,000 or more	98	46
Total	100	100
Region		
Northeast	11	17
Midwest	15	23
South	41	35
Washington, D.C., metropolitan area	13	2
West	21	23
Total	100	100
Addendum:		
Veterans (percentage of workforce)	21	4
Average age (years)	46	41
Number of people in sample	1,155	25,564

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA. See www.cbo.gov/publication/59970#data.

* = between zero and 0.5 percent.

or medical degree), or doctorate, compared with 15 percent of private-sector employees.

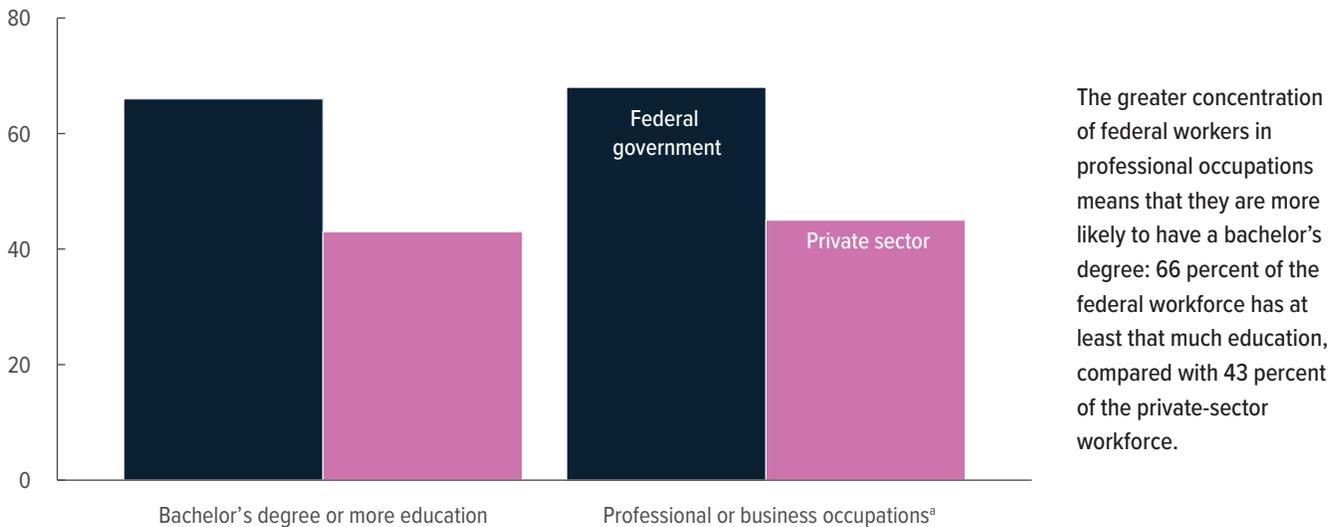
The federal government provides services across the nation, and its employees live in many locations. Particular types of workers—such as nurses and doctors

at veterans' health care facilities, security screeners at airports, and air traffic controllers—are spread throughout the United States. About 13 percent of federal employees live in or around Washington, D.C. (compared with 2 percent of the private-sector workforce); the other 87 percent of federal workers—about 2 million

Figure 1-3.

Differences Between the Federal and Private-Sector Workforces, by Educational Attainment and Occupation, 2022

Percentage of workforce



The greater concentration of federal workers in professional occupations means that they are more likely to have a bachelor's degree: 66 percent of the federal workforce has at least that much education, compared with 43 percent of the private-sector workforce.

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA. See www.cbo.gov/publication/59970#data.

a. Corresponds to the occupational categories "Professional" and "Management, business, and financial" listed in Table 1-1. About 70 percent of the workers in those occupations have at least a bachelor's degree, compared with 19 percent of the workers in other occupations.

people—are located throughout the country in proportions roughly similar to those of workers in the private sector.

Differences by Size of Employer

The characteristics of employers in the private sector also differ from those of the federal government. Many federal employees work for agencies that are large; the biggest, the Department of Defense, employs about 774,000 civilian workers. In contrast, a small portion of private-sector employees work for firms with more than 500,000 employees. The largest category (by size of firm) in the main data source CBO used for this analysis is 1,000 or more employees. Nearly all federal employees work for agencies that have at least 1,000 workers, whereas only about half of private-sector employees work for entities of that size. (This analysis characterizes firms with 1,000 or more employees as large and those with fewer than 1,000 employees as small.)

The attributes of the federal workforce are more like those of private-sector workers at large firms than those

of workers at small firms. That is primarily because both large firms and federal agencies tend to require a workforce that is more specialized and educated than small firms do. For example, many federal employees have expertise in specific tasks, as about 96 percent of them work in agencies that divide tasks among more than 100 occupations. That degree of specialization is not possible for small employers. In addition, only 36 percent of workers at small firms have at least a bachelor's degree, whereas the proportion of workers with that level of education is greater at large firms (49 percent) and in the federal government (66 percent).

How CBO Analyzed Federal Compensation

The central question addressed in this analysis is this: How would the federal government's compensation costs differ if the average cost of employing federal workers was the same as that of employing workers with certain similar observable characteristics in the private sector? To answer that question, CBO examined average compensation costs for employees in the federal government and

the private sector, accounting for differences in those characteristics. (For its benchmark comparison group, CBO focused on private-sector employees working in large firms.) CBO's results apply to the cost of employing full-time, full-year workers—who accounted for about 95 percent of the total hours worked by federal employees in 2022—because the data available for them are more accurate than the data for other workers.

The comparison between the two sectors is based on the cost that an employer incurs in providing compensation. That cost covers wages and salaries, a share of health insurance premiums, retirement benefits, paid leave, and payroll taxes (which fund government programs such as Social Security and Medicare). The analysis excludes certain benefits some workers receive—for example, the often above-market rate of return the federal government offers its employees through the G fund (one of the investment options in their retirement plan) and the stock options that some private-sector firms provide to their employees. In CBO's assessment, the benefits that are not included in this analysis are less costly, on average, than the ones that are included.

CBO measured the cost of benefits provided to retirees as the present value of future obligations—that is, as a single number that expresses a flow of current and future payments in terms of an equivalent lump sum paid today. The work that federal employees provided in 2022 resulted in an increase, on average, in the benefits the government will provide them in retirement. That increase is calculated as the amount of expected future benefits workers would receive if they left federal employment at the end of 2022 minus the amount they would have received if they departed at the beginning of 2022. CBO uses the government's cost of borrowing to convert that increase in expected future benefits to a lump sum paid in 2022. In this report, that lump-sum valuation of future benefits is the cost of retirement benefits to the government. (In contrast, the cost of retirement benefits for federal workers is recorded in the federal budget when those benefits are claimed during retirement.)

In both the federal government and the private sector, compensation may depend on a number of factors that can be observed and measured. CBO sought to account for differences in those factors—education, occupation, years of work experience, geographic location (region of the country and urban or rural location), size of employer, veteran status, and certain demographic characteristics (sex, race, ethnicity, marital status, immigration status, and citizenship). That approach produced a comparison between the average compensation of federal workers and the average compensation of private-sector workers who have certain similar observable attributes. (For more details about that approach, see Appendix A.) Because education plays a particularly large role in determining compensation, CBO reports its results for five levels of educational attainment: high school diploma or less, some college, bachelor's degree, master's degree, and doctorate or professional degree.

Those average differences in pay do not show precisely what federal workers would earn if they were employed in comparable positions in the private sector, for at least three reasons. First, people's compensation is also affected by many characteristics that are not easy to observe or measure, such as their natural ability, personal motivation, and effort. The degree to which federal and private-sector employees may differ with regard to those characteristics is much harder to quantify, and no adjustments were made for those attributes in this analysis. Second, substantial ranges of compensation exist in both the federal government and the private sector among workers who have similar observable attributes. Third, the estimated differences depend on how well the observable characteristics were measured in the surveys of employees used by CBO and on other factors that are inherent in any statistical analysis. For example, the data used for this analysis do not precisely measure years of work experience. (For details on measurement issues, see Appendix A.)

Chapter 2: Comparison of Wages, Benefits, and Total Compensation in the Federal Government and the Private Sector

Using the analytic approach described in Chapter 1, the Congressional Budget Office compared compensation for employees in the federal government and private sector that have similar observable characteristics. Those comparisons cover wages, benefits, and total compensation (the sum of wages and benefits) in 2022—the year by which the temporary effects of the coronavirus pandemic on the workforce had largely subsided.

Comparison of Wages

Using data from the Current Population Survey, CBO compared average hourly wages for federal civilian workers, by the highest level of education they achieved, with average hourly wages for private-sector workers who have certain similar observable traits that affect wages. (The Current Population Survey is a monthly survey of U.S. households conducted by the Census Bureau for the Bureau of Labor Statistics.) CBO also compared wage ranges—such as the range between the 10th percentile and 90th percentile—for federal workers and similar workers in the private sector.¹

Average Wages

By CBO’s estimate, the difference between hourly wages of federal and private-sector employees varied greatly according to educational attainment. The extent of that variation in wages is evident in three comparisons: for the least-educated workers, for workers with a bachelor’s degree (the most common level of education in the federal workforce), and for the most-educated workers.

- Federal employees with no more than a high school diploma earned 17 percent more per hour, on average, than private-sector employees with the same level of education.
- Federal employees whose highest level of education was a bachelor’s degree—about one-third of the federal workforce—earned roughly 10 percent less

per hour, on average, than similar workers in the private sector.

- Federal workers with a doctorate or professional degree earned 29 percent less per hour, on average, than similar workers in the private sector (see Table 2-1).

For employees at all education levels, wages were 10 percent lower, on average, for workers in the federal government than for benchmark private-sector workers with certain similar observable characteristics, CBO estimates. Thus, if the federal government had wanted to match its employees’ wages with those of their private-sector counterparts—by decreasing the pay of its less educated employees and increasing the pay of its more educated employees—it would have had to boost its spending on wages by about 10 percent.

Accounting for differences in observable traits was important—especially in terms of educational attainment—for this analysis. That is because highly educated workers tend to earn much higher wages than less educated workers, and federal employees have more education, on average, than employees in the private sector. Accounting for differences in some of the other characteristics was also important because federal employees tend to work in higher-paying occupations and to have more years of work experience, which tend to be associated with higher wages.² Finally, employees of large firms tend to earn more per hour than employees of small firms, and federal employees are more than twice as likely as private-sector employees to work for entities that employ at least 1,000 people. Besides accounting for differences in those characteristics, CBO compared fed-

1. A percentile is a value that indicates the percentage of observations in a distribution that falls below it.

2. Some pay comparisons have not included adjustments for differences in observable traits and have found that the wages of federal workers exceed those of workers in the private sector. See, for example, Chris Edwards, “Reforming Federal Worker Pay and Benefits” (Cato Institute, August 2019), www.downsizinggovernment.org/federal-worker-pay. Those comparisons used data sets that did not include measures of education and job experience. It is standard practice to adjust for differences in those characteristics when data on them are available.

Table 2-1.

Federal and Private-Sector Wages, by Workers' Educational Attainment, 2022

	Average wages (dollars per hour)		Percentage difference in averages
	Federal government	Private sector ^a	
High school diploma or less	33.90	28.90	17
Some college	37.20	33.10	12
Bachelor's degree	45.40	50.60	-10
Master's degree	51.40	61.80	-17
Professional degree or doctorate	62.30	87.40	-29
All levels of education	45.20	50.30	-10

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA. See www.cbo.gov/publication/59970#data.

Wages are measured as an average hourly wage rate and include overtime pay, tips, commissions, and bonuses.

a. Average wages for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

eral workers with private-sector workers who had similar demographic traits, but that adjustment had little effect on the difference in average wages between federal and private-sector employees.

The large size of federal agencies does not necessarily imply that federal workers would receive the higher wages typical of large firms if they moved to the private sector. On the one hand, jobs are likely to be more specialized in the federal government and at large private firms than they are at smaller firms, so large private-sector employers might be willing to pay for the specialized skills of federal workers. That possibility suggests that accounting for the size of an employer leads to a more meaningful comparison of wages. On the other hand, the higher wages paid by large private firms may not reflect pay for skills that are transferable between the federal and private sectors, so adjusting for an employer's size could understate the difference between average federal and private-sector wages for workers with similar traits. If this analysis had not made adjustments for employers' size, the difference between average federal and private-sector wages for all workers would have shrunk from -10 percent to -4 percent. (Similar changes would have occurred in the differences for workers at each level of education.)

Differences between the average wages of federal and private-sector employees with the same measured traits could reflect other factors. For example, those differences could stem from the effects of personal characteristics that cannot be measured or the way that the federal

government and the private sector determine pay (or a combination of those factors). The data do not allow CBO to gauge the degree to which each unmeasured factor affected differences in average wages between the sectors.

The findings of this analysis vary from the results of some other studies of public- and private-sector wages. That variation is largely attributable to differences in analytic methods.³

One way in which this analysis differs from others is in its measure of wages. To address the question of how the government's costs for wages and salaries would change if federal workers cost the same amount to employ as similar private-sector workers, CBO focused on differences in *average* wages, which are closely tied to total government spending for the pay of federal employees. Other

3. The distinction between those methods, and the relationship of this analysis to previous research, are discussed in more detail in Justin Falk, *Comparing Wages in the Federal Government and the Private Sector*, Working Paper 2012-3 (Congressional Budget Office, January 2012), section II, www.cbo.gov/publication/42922. That paper addresses CBO's analysis of federal wages from 2005 through 2010, but the points remain relevant for 2022. The relationship between CBO's analysis and previous research is also discussed in Government Accountability Office, *Federal Workers: Results of Studies on Federal Pay Varied Due to Differing Methodologies*, GAO-12-564 (June 2012), www.gao.gov/products/GAO-12-564; and David H. Bradley, *Comparing Compensation for Federal and Private-Sector Workers: An Overview*, Report R42636, version 2 (Congressional Research Service, July 30, 2012), <https://tinyurl.com/s9kksjkc>.

evaluations that found larger differences between federal and private-sector pay used a different measure of wages.⁴ That measure overstates the differences between the cost of employing federal workers and similar private-sector workers, however, because the dispersion of wages (the range from low to high) differs between those groups.

Another key feature of CBO's approach is its comparison of workers with similar characteristics (such as education, experience, and occupation) instead of similar jobs. Most other studies of federal and private-sector compensation compare workers with similar characteristics, but some research attempts to compare similar jobs. One such analysis found that the average salary for federal employees is much lower than the average for private-sector workers in comparable jobs.⁵ By focusing the comparisons on specific, detailed occupations, however, that study may have compared federal workers with private-sector workers who have more experience because federal workers move into higher positions more quickly than do workers in the private sector.⁶

Distribution of Wages

In addition to looking at average wages, CBO examined the distribution of wages for federal and private-sector workers with certain similar observable characteristics in each category of educational attainment. It then compared wages in the two sectors at the 10th, 25th, 50th (median), 75th, and 90th percentiles of those distributions.⁷ At all five levels of educational attainment,

lower-wage workers (those at the 10th and 25th percentiles) earned more in the federal government than in the private sector. By contrast, among employees with at least a bachelor's degree, high-wage workers (those at the 75th and 90th percentiles) earned less in the federal government than in the private sector. Among employees whose education culminated in a bachelor's degree, the difference in the estimates of wages at the 75th percentile was small.

The dispersion of wages tends to be narrower for federal employees than for employees in the private sector because wages are more compressed in the federal government. For example, as measured by the range from the 10th percentile to the 90th percentile, the dispersion of wages was smaller for federal employees with at least a bachelor's degree than it was for similar private-sector employees. The difference was especially pronounced for people with a professional degree or doctorate, mostly because the 90th percentile of wages was much lower for federal employees in 2022 than for private-sector workers with the same level of education (see Figure 2-1). The 90th percentile of wages was also much lower for federal employees among workers whose education culminated in a bachelor's degree. In fact, the differences in the higher percentiles were so large that they pushed the average wage of federal employees below the average wage of their private-sector counterparts in that year. In contrast, the *median* wage of federal employees whose education culminated in a bachelor's degree was higher than the median wage of their private-sector counterparts.

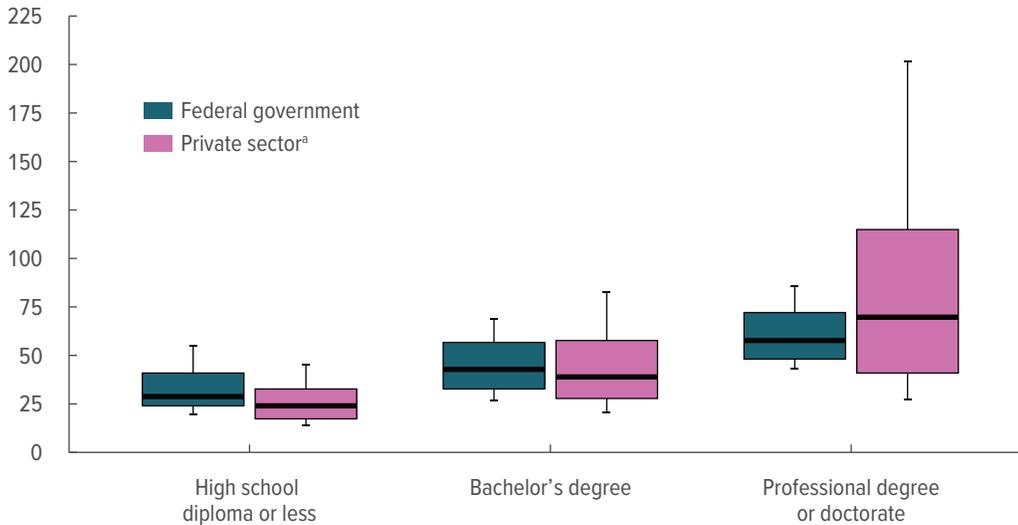
For workers at all levels of education, the prevalence of higher wages elevated the average wage above the 50th percentile, particularly in the private sector. At all five levels of educational attainment, more workers earned a wage far above the median than one far below it. Thus, most workers in both sectors earned less than the average amounts that are reported in Table 2-1. Moreover, average wages can substantially overstate the wages earned by most workers. For example, although the average wage was \$29 for workers in the private sector whose education culminated in a high school diploma or less, 63 percent of those workers earned less than that amount. In addition, about 50 percent of federal workers whose education culminated in a high school diploma or less earned less than the average wage of their private-sector counterparts, even though the average wage was 18 percent higher among the federal workers.

4. Rachel Greszler and James Sherk, *Why It Is Time to Reform Compensation for Federal Employees*, Backgrounder 3139 on Labor (Heritage Foundation Center for Data Analysis, July 2016), <https://tinyurl.com/zf25ymg>; and Andrew G. Biggs and Jason Richwine, *Comparing Federal and Private Sector Compensation*, Economic Policy Working Paper 2011-02 (American Enterprise Institute, June 2011), www.aei.org/publication/comparing-federal-and-private-sector-compensation.
5. Federal Salary Council, memorandum to the President's Pay Agent and others, "Level of Comparability Payments for January 2024 and Other Matters Pertaining to the Locality Pay Program" (February 2023), <https://tinyurl.com/nmbabr5t>.
6. Melissa Famulari, "What's in a Name? Title Inflation in the Federal Government" (draft, University of Texas at Austin, August 2002), <https://econweb.ucsd.edu/~mfamular/pdfs/FederalPrivatepay.pdf>.
7. For details about how CBO constructed the wage distributions, see Justin Falk, *Comparing Wages in the Federal Government and the Private Sector*, Working Paper 2012-3 (Congressional Budget Office, January 2012), section V, www.cbo.gov/publication/42922.

Figure 2-1.

Dispersion of Federal and Private-Sector Wages, by Workers' Educational Attainment, 2022

Dollars per hour



The span between the wages of the highest- and lowest-earning employees was narrower in the federal government than in the private sector in 2022, even after accounting for employees' educational attainment and other observable traits. The narrower dispersion among federal employees may reflect the constraints of federal pay systems.

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA. See www.cbo.gov/publication/59970#data.

The horizontal line in the middle of each shaded box indicates the median (50th percentile) wage; the top and bottom of the box mark the 75th and 25th percentiles, respectively; and the whiskers above and below the box mark the 90th and 10th percentiles.

a. Wages for private-sector workers who resemble federal workers in occupation, years of work experience, and certain other observable characteristics that are likely to affect wages.

When workers are grouped by occupation instead of education, the dispersion of wages also tends to be narrower for federal employees than for their private-sector counterparts. For managers in 2022, for example, the range of wages from the 10th percentile to the 90th percentile was 44 percent smaller in the federal government than in the private sector, CBO estimates.

The narrower dispersion of wages among federal workers may reflect the constraints of federal pay systems, which limit the pay of managers and make it harder for managers to reward the best performers or to limit the compensation of the worst performers. The highest salaries under federal pay schedules are substantially lower than the average salaries for most executive positions in the private sector.⁸ In addition, despite some tools for rewarding top

performers in the federal pay system (such as promotions and bonuses), most federal workers compensated under pay schedules move to progressively higher pay levels as they become eligible on the basis of their years of federal employment. (For more details about those pay schedules, see Appendix B.)

Comparison of Benefits

The federal government and most large private employers provide various forms of noncash compensation, such as retirement benefits, health insurance, and paid leave. The cost of providing those benefits varies greatly among private-sector employers as well as between the federal government and the private sector. Smaller private employers generally offer less-generous health insurance and other benefits. However, almost all employers (regardless of size) are required to pay various payroll taxes to fund all or part of the benefits that workers or retirees receive through Social Security, Medicare, unemployment insurance, and workers' compensation programs.

In both the federal government and the private sector, the cost of some benefits, such as retirement benefits and

8. Congressional Budget Office, *Comparing the Pay and Benefits of Federal and Nonfederal Executives* (November 1999), www.cbo.gov/publication/12015. That report compared pay in 1998. By 2022, the highest salaries in the federal pay schedules had risen to \$226,300 for the Executive Schedule and \$203,700 for the Senior Executive Service. Those amounts were below the average salaries for most executive positions at large private-sector firms in 1998, and the average salaries for those positions had probably grown by 2022.

Table 2-2.

Federal and Private-Sector Benefits, by Workers' Educational Attainment, 2022

	Average benefits (2022 dollars per hour)		Percentage difference in averages
	Federal government	Private sector ^a	
High school diploma or less	24.40	12.90	88
Some college	28.00	14.60	91
Bachelor's degree	31.70	22.00	44
Master's degree	33.50	26.20	28
Professional degree or doctorate	35.10	35.00	1
All levels of education	30.70	21.50	43

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA; Office of Personnel Management; Bureau of Labor Statistics. See www.cbo.gov/publication/59970#data.

Benefits are measured as the average cost, per hour worked, that an employer incurs in providing noncash compensation. The average benefits shown here are for workers at firms that employ at least 1,000 people.

a. Average benefits for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

paid leave, is based largely on the wages that employees receive. Thus, the factors that determine an employee's wages—such as education, occupation, and experience—also influence the cost that an employer incurs to provide those benefits. For example, workers with more education tend to receive more expensive retirement benefits as well as higher wages.

The cost of other benefits, by contrast, is not directly affected by the wages that employees receive. In particular, the cost of providing health insurance for federal workers depends directly on the type of coverage selected (single, single plus one, or family) and the insurance plan chosen. (That cost may be indirectly affected by the employee's wages if higher-income workers tend to choose more expensive insurance plans.)

CBO compared the cost of the benefits provided to federal and private-sector employees, accounting for the same differences in workers' characteristics that were used to analyze wages. For consistency with hourly wages, the cost of benefits was measured on an hourly basis (by dividing estimates of the annual cost that an employer incurred to provide those benefits by the number of hours that an employee worked during the year).

As with wages, differences in the cost of benefits in the federal government and the private sector varied by employees' highest level of education (see Table 2-2). Again, the extent of that variation is evident in three comparisons: for the least-educated workers, for workers

with a bachelor's degree, and for the most-educated workers.

- For federal workers with a high school diploma or less education, benefit costs were 88 percent higher, on average, than costs for similar workers in the private sector, in CBO's estimation.
- Benefit costs were 44 percent higher, on average, for federal workers whose highest level of education was a bachelor's degree than for their private-sector counterparts.
- Benefit costs were roughly the same, on average, for federal and private-sector workers with a professional degree or doctorate.

Among workers at all education levels, benefits cost about \$31 per hour worked, on average, for federal employees and \$22 per hour worked for private-sector employees, CBO estimates. Thus, benefits for federal workers cost 43 percent more per hour worked, on average, than benefits for private-sector workers with similar observable attributes. Benefits also constituted a larger share of total compensation for federal workers (40 percent) than for workers in the private sector (30 percent).

Most of the higher cost of benefits incurred by the federal government stems from retirement benefits. The federal government provides retirement benefits to its workers through both defined benefit plans (pensions) and defined contribution plans, whereas many large private-sector employers have replaced defined benefit

Table 2-3.

Total Compensation in the Federal and Private Sectors, by Workers' Educational Attainment, 2022

	Average total compensation (dollars per hour)		Percentage difference in averages
	Federal government	Private sector ^a	
High school diploma or less	58.30	41.80	40
Some college	65.20	47.70	38
Bachelor's degree	77.10	72.60	5
Master's degree	84.90	88.00	-4
Professional degree or doctorate	97.40	122.30	-22
All levels of education	75.90	71.70	5

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA; Office of Personnel Management; Bureau of Labor Statistics. See www.cbo.gov/publication/59970#data.

Total compensation consists of wages and benefits. The average compensation shown here is for workers at firms that employ at least 1,000 people. Because a broader sample was used to compare wages than to compare benefits, the numbers shown here for total compensation may not equal the sum of the numbers for wages and benefits separately.

a. Average total compensation for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

plans with defined contribution plans.⁹ The federal government also provides subsidized health insurance to qualified retirees, an arrangement that has become much less common in the private sector.

Comparisons by other researchers have found bigger differences between average benefits in the federal and private sectors. Those comparisons have not used data that allow federal employees to be compared with private-sector employees who have similar job-related attributes, though.¹⁰ CBO's approach shows that a large portion of the differences in benefits can be attributed to the fact that federal workers have more years of education and experience, on average, than private-sector workers do.

CBO's estimates of differences in benefits between the two sectors are more uncertain than its estimates of

9. Defined benefit plans provide retirement income that is based on fixed formulas, and the amount of that income is usually determined by an employee's salary history and years of service. In contrast, the amount of retirement income provided by a defined contribution plan (such as a 401(k) account) depends on the amount of contributions made by the employer and employee and the performance of the account's investments.

10. For details, see Justin Falk, *Comparing Benefits and Total Compensation in the Federal Government and the Private Sector*, Working Paper 2012-4 (Congressional Budget Office, January 2012), section II, www.cbo.gov/publication/42923.

differences in wages. That greater uncertainty reflects the complexity of measuring benefits and the extrapolations that were necessary to integrate data sets from various sources for this analysis. (For more details about those sources, see Appendix A.)

Comparison of Total Compensation

CBO combined its analyses of wages and benefits to assess differences in total compensation between the federal government and the private sector for workers with certain similar observable characteristics.

- Among workers with a high school diploma or less education, total compensation costs were 40 percent higher, on average, for federal employees than for similar private-sector employees.
- Among workers whose education ended in a bachelor's degree, the cost of total compensation averaged 5 percent more for federal workers than for similar workers in the private sector.
- Among workers with a professional degree or doctorate, by contrast, total compensation costs were 22 percent lower, on average, for federal employees than for private-sector employees with similar attributes (see Table 2-3).

For workers with less than a bachelor's degree, the cost of total compensation averaged about \$63 per hour worked

for federal employees, compared with about \$45 per hour worked for employees in the private sector with certain similar observable characteristics. In contrast, the cost of total compensation averaged about \$83 per hour worked for federal employees with a bachelor's degree or more, which is about \$3 less than the average for their private-sector counterparts. Overall, total compensation was about 5 percent higher, on average, for federal workers than for similar private-sector workers. That means the government spent about 5 percent more on total compensation in 2022 than it would have spent if it had provided its employees with compensation equal to that of their private-sector counterparts.

Comparisons of total compensation are an incomplete indicator of the government's ability to recruit and retain a qualified workforce. In part that is because workers might value wages differently than they value benefits. In this analysis, benefits are measured in terms of the cost that employers incur in providing them, which might not match the value that employees place on receiving them. From employees' perspective, therefore, differences

in benefits might not compensate for apparently countervailing differences in wages, even if the measured differences in benefits and wages are similar in size. On the one hand, workers tend to pay less income tax on compensation that takes the form of benefits than they do on wages, which enhances the value of benefits. On the other hand, some research indicates that workers are willing to pay only a small portion of the cost of funding an increase in pension benefits, which suggests that they value wages more highly than pension benefits.¹¹ For a detailed discussion of that possibility, as well as the other factors that affect employers' ability to recruit and retain a qualified workforce, see Chapter 4.

11. Maria Donovan Fitzpatrick, "How Much Are Public School Teachers Willing to Pay for Their Retirement Benefits?" *American Economic Journal: Economic Policy*, vol. 7, no. 4 (November 2015), pp. 165–188, <https://dx.doi.org/10.1257/pol.20140087>. That study includes a discussion of why defined benefit pensions are still common in the public sector even though the value that workers place on them appears to be lower than their cost.

Chapter 3: Changes in the Comparisons Since CBO Last Analyzed Federal Compensation

The Congressional Budget Office’s previous comparison of federal and private-sector compensation, published in 2017, covered differences in workers’ wages, benefits, and total compensation over the 2011–2015 period. This report, which used analytic methods that are broadly similar, covers 2022. CBO found that for both periods, federal pay exceeded private-sector compensation for workers with less education but fell short of private-sector compensation for workers with more education. Between those two periods, though, federal compensation rose less than private-sector compensation. Thus, the extent to which federal pay exceeded private-sector pay for workers with less education narrowed by 2022, and the pay of federal workers with more education fell further short of their counterparts in the private sector by then.

Changes in the Comparison of Wages

For workers at all five levels of educational attainment, the wages paid by the federal government grew less than private-sector wages from the 2011–2015 period to 2022, which changed the differences in average wages between the sectors.

- The average wage of federal workers with less than a bachelor’s degree exceeded the average wage of their private-sector counterparts by less in 2022 than between 2011 and 2015.
- Among workers with a bachelor’s degree, the average wage of federal workers was 10 percent less than the average wage of similar private-sector workers in 2022, whereas the average wage of federal workers exceeded the average wage of similar private-sector workers by 5 percent between 2011 and 2015.
- The average wage of federal workers with more than a bachelor’s degree fell further short of the average wage of their private-sector counterparts in 2022 than between 2011 and 2015 (see Table 3-1).

Overall, the average wage for federal workers was 10 percent less than the average wage for similar private-sector workers in 2022. In the earlier period, the average wage for federal workers exceeded the average wage for similar private-sector workers by 3 percent.

Most of the change in the average wage differential can be attributed to the difference between adjustments to the main pay schedule (the General Schedule) for federal employees and wage growth in the private sector.¹ About 11 percentage points of the difference stemmed directly from across-the-board salary increases for federal employees that were smaller than wage growth in the private sector (see Figure 3-1). The rest of the change in the average wage differential, which was 2 percentage points, might be the result of imprecision in the estimates stemming from the limited number of federal workers in the sample.

The Federal Employees Pay Comparability Act of 1990 (FEPCA) specifies that the salaries of federal employees on the General Schedule be adjusted annually on the basis of changes in the salaries of private-sector workers as measured by the employment cost index (ECI) compiled by the Bureau of Labor Statistics. From 2011 through 2015, salaries of private-sector workers rose by an average of 1.9 percent per year, but lawmakers chose to implement smaller annual increases—averaging less than half a percent—for federal employees.² Salaries in 2015 reflected the cumulative impact of those smaller increases, whereas average salaries over the five-year

1. The General Schedule determines the pay of about 60 percent of federal workers. Most other federal workers receive an annual adjustment to their salary that roughly equals the adjustment for the General Schedule.
2. FEPCA authorizes the President to submit an alternative salary adjustment to the Congress if a national emergency or serious economic downturn is affecting the general welfare of the U.S. population.

Table 3-1.

Percentage Differences Between Federal and Private-Sector Compensation, by Type of Compensation, Analytic Period, and Workers' Educational Attainment

Percentage differences between averages^a

	Wages		Benefits		Total compensation	
	2011 to 2015	2022	2011 to 2015	2022	2011 to 2015	2022
High school diploma or less	34	17	93	88	53	40
Some college	22	12	80	91	39	38
Bachelor's degree	5	-10	52	44	21	5
Master's degree	-7	-17	30	28	5	-4
Professional degree or doctorate	-24	-29	-3	1	-18	-22
All levels of education	3	-10	47	43	17	5

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA; Office of Personnel Management; Bureau of Labor Statistics. See www.cbo.gov/publication/59970#data.

The approach that CBO used to compare compensation for 2022 is similar to the approach the agency used to compare compensation from 2011 to 2015.

a. Calculated by subtracting from the average compensation for federal workers the average compensation for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

period covered by CBO's previous analysis only partially reflected the smaller increases. Thus, by 2015, federal wages were probably lower relative to the wages of their private-sector counterparts than they were over the 2011–2015 period, on average.

Increases to the General Schedule continued to be smaller than wage growth in the private sector in most years from 2016 through 2022. Lawmakers enacted the wage increase specified by FEPCA in 2020 and 2022 but implemented smaller increases in the other five years. On average, the across-the-board increases to federal salaries were 0.6 percentage points smaller than the pay adjustments specified by FEPCA. In addition, FEPCA specifies that each pay adjustment be based on the rate of wage growth in the private sector during the 12-month period that ended 15 months before implementation of the adjustment. Following that formula, the pay adjustment for federal employees for 2022 did not account for the acceleration of wage growth in 2021, so it was 2.4 percentage points smaller than growth in private-sector wages in 2021. (In contrast, on the basis of private-sector wage growth in 2022, federal pay rates were increased by 5.3 percent in 2024. In CBO's estimation, that federal pay adjustment will exceed private-sector wage growth from 2023 to 2024 by 1.3 percentage points because the formula does not account for the slowdown in private-sector wage growth in 2023.)

Smaller salary increases for federal employees could indirectly affect the wage differential by causing federal agencies to position job offerings higher in the pay scale or give larger raises based on seniority and merit.³ CBO found that pay increases based on seniority, merit, or changes in position averaged about 2.5 percent in years when the across-the-board increase was 1 percent, though, as well as when it was 2 percent or 3 percent.⁴ Another way the indirect effects of smaller salary increases might offset some of the direct effect is if employees responded to the smaller increases by working fewer hours. That change would boost employees' wages, which are calculated by dividing their salaries by the number of hours they work. CBO found, however, that the measure of hours worked has changed little over the years.

Changes in the Comparisons of Benefits and Total Compensation

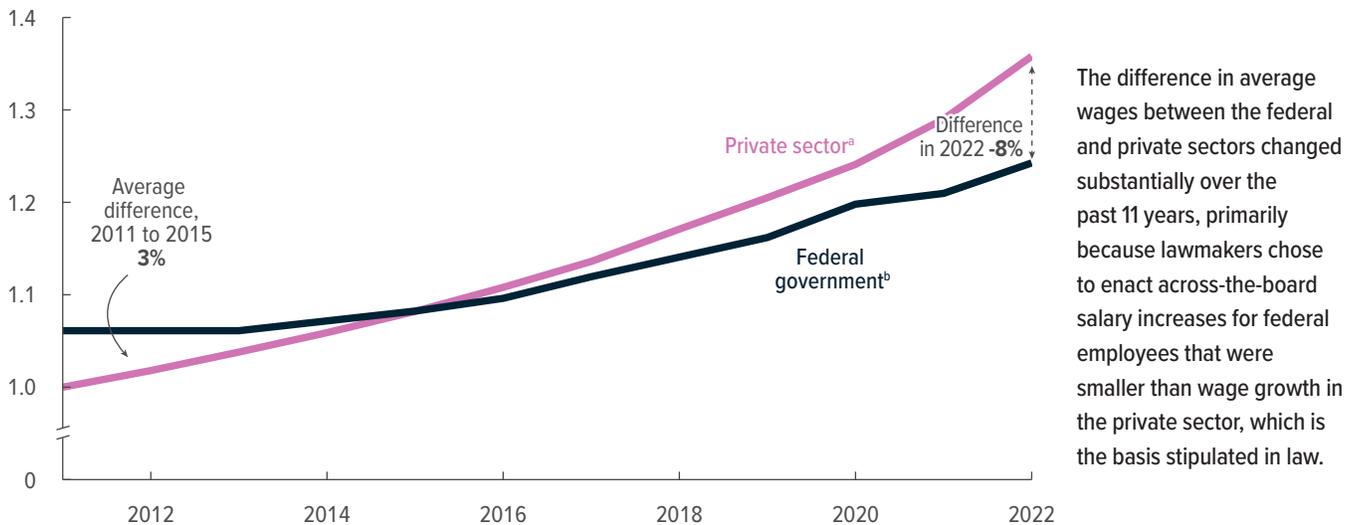
For workers at most levels of educational attainment, the cost of federal benefits exceeded the cost of benefits for

3. The extent to which agencies can increase salaries is limited by the rules of the pay schedules and the amount of funding the agencies receive each year.
4. Salaries of workers who remain employed tend to grow faster than the ECI in both sectors because those workers are gaining job experience. The ECI does not include wage growth from additional job experience, instead holding job experience constant.

Figure 3-1.

Salary Growth and Adjustments to the General Schedule

Salary relative to the average salary of private-sector workers in 2011



Data sources: Congressional Budget Office; Congressional Research Service; Bureau of Labor Statistics. See www.cbo.gov/publication/59970#data.

- Salary growth is based on the employment cost index for the salaries of workers in private industry.
- Salary growth is based on the across-the-board increases and changes in locality payments for workers on the General Schedule. The initial salary (that is, the value for 2011) is set to 1.06 so that federal salaries are 3 percent higher than private-sector salaries during the 2011–2015 period, on average. (CBO found that the wages of federal employees exceeded those of their private-sector counterparts by 3 percent over that period.)

their private-sector counterparts by less in 2022 than it had during the 2011–2015 period. Overall, the cost of federal benefits was 43 percent higher than the cost of benefits for similar workers in the private sector in 2022, CBO estimates, down from 47 percent in the earlier period.

Changes in wages are largely responsible for the changes in benefits. Slower wage growth for federal workers than for private-sector workers led to less growth in the cost of benefits because the costs of pensions, paid leave, and legally required benefits are closely tied to wages. That slower wage growth and resulting narrowing of the benefit differentials between the sectors was partly offset by two factors: an increase in paid leave for federal employees, and a decline in the cost of deferred benefits in the private sector. (The share of private-sector workers who receive defined benefit pensions and health insurance in retirement has continued to decrease.)

In terms of total compensation, the cost for the federal government grew less than the cost for the private sector between the two periods. That slower growth changed

the differences in total compensation between the sectors for workers at various levels of educational attainment.

- The average total compensation of federal workers with a bachelor's degree or less exceeded the total compensation of their private-sector counterparts by less in 2022 than between 2011 and 2015.
- Among workers with a master's degree, the average total compensation for federal workers was 4 percent *less* than the average total compensation for similar private-sector workers in 2022. Between 2011 and 2015, the average total compensation for federal workers with a master's degree was 5 percent *more* than the average for similar private-sector workers.
- The average total compensation of federal workers with a professional degree or doctorate fell further short of that of their counterparts in the private sector in 2022 than in the earlier period.

Overall, the average total compensation for federal workers was 5 percent larger than the average total compensation for similar private-sector workers in 2022,

a narrowing from the difference of 17 percent over the 2011–2015 period.

Benefit costs could be affected in the future as a result of two changes that lawmakers made in the early 2010s to reduce the cost of defined benefit pensions to the federal government. In 2012 and 2013, they increased by a total of 3.6 percentage points the portion of their salaries that federal employees hired after 2013 must contribute to their defined benefit pensions.⁵ Those changes had

little effect on CBO’s estimates of the costs of benefits and total compensation in either period. (For the 2022 analysis, that is because most workers hired after 2012 would have been refunded their contributions if they stopped accruing pension benefits at the beginning of 2023.)⁶ Eventually, though, the increase in employees’ contributions is likely to reduce the cost of pensions to the federal government by about 3.6 percent of salaries because lawmakers did not adjust the formula for calculating pension payments.

5. First, the Middle Class Tax Relief and Job Creation Act of 2012 (Public Law 112-96) increased the contribution rate from 0.8 percent to 3.1 percent for most federal employees hired after December 31, 2012. Then, the Bipartisan Budget Act of 2013 (P.L. 113-67) further raised the contribution rate to 4.4 percent for most employees hired after December 31, 2013.

6. Some workers hired after 2012 would receive a refund of their contributions because they had not accumulated the five years of federal service required to qualify for a pension. The other workers hired after 2012 would have accumulated between 5 years and 10 years of federal service. Most departing employees with that amount of service choose a refund of their contributions over receipt of future pension benefits. Thus, CBO concluded that most employees with 5 years to 10 years of federal service would elect a refund if they could not accrue additional pension benefits after 2022.

Chapter 4: Comparison of Other Job Attributes That Can Affect Recruitment and Retention

Differences in average wages and average benefits are not the only factors that are likely to affect the federal government's ability to recruit and retain a highly qualified workforce. Most workers are willing to accept jobs that offer less in wages and benefits if they have more of the other attributes that they value. An employer who offers more of those attributes can spend less on wages and benefits and still recruit and retain a highly qualified workforce.

This chapter examines three of those job attributes: job security, the composition of compensation (specifically, the portion that is deferred), and the flexibility to work from home. Workers value job security, and federal employment offers more of it than many jobs in the private sector. Conversely, a greater share of federal compensation is deferred until retirement, which many workers find less valuable than wages. And allowing employees to work from home can boost recruitment and retention.

In evaluating job security, the composition of compensation, and working from home, the Congressional Budget Office compared federal workers with private-sector workers who have certain similar observable traits. To the extent practical, the agency matched workers using the same set of traits that it used when comparing wages because traits that are likely to affect wages may also affect other job attributes. But the data sources CBO used to compare job security and working from home did not have enough information on firm size to limit the comparisons to private-sector workers at large firms (which most of the other comparisons in this report were able to do). Thus, the comparisons of those job attributes are less certain than the comparison of wages.

CBO did not incorporate those job attributes into its estimates of the differences in compensation between the federal government and the private sector for two

reasons. First, this report focuses on the costs the federal government incurred in compensating its employees in 2022, and the value workers placed on those attributes was not a cost to the government (even though it might indicate a potential source of savings). Second, that value is more uncertain than the costs of wages and benefits because it is more difficult to measure. Nonetheless, CBO included this discussion of the attributes to provide some insight about how much workers value them and how they affect recruitment and retention.

Comparison of Job Security

Workers are generally willing to accept less compensation as a trade-off for obtaining a job that they are less likely to lose. That is because job loss that results in a long period of unemployment can lead to large and unanticipated reductions in income, which can cause severe financial hardship.

To compare job security in the federal government with that in the private sector, CBO estimated the share of the year that people spend unemployed because of job loss in each sector. Federal employees typically experience less time unemployed because they are less likely to lose their job than their private-sector counterparts. In 2022, federal workers were unemployed because of involuntary job loss for 0.6 percent (or about two days) of the year, whereas their private-sector counterparts were unemployed for 1.3 percent (or about five days) of that year, on average (see Table 4-1).

CBO derived those percentages from the Current Population Survey (CPS). Specifically, among respondents to the CPS each month who were in (or most recently in) the sector, the share is the number of months that they reported being unemployed because of job loss divided by the sum of that number and the number of months that they reported being employed. To improve the precision of those estimates, CBO used responses

Table 4-1.

Job Security in the Federal and Private Sectors, by Workers' Educational Attainment, 2022

Percent

	Share of labor force unemployed after job loss		
	Federal government	Private sector ^a	Difference in shares
High school diploma or less	1.1	2.2	-1.1
Some college	1.2	1.5	-0.4
Bachelor's degree	0.2	1.1	-0.9
Master's degree	0.1	0.8	-0.7
Professional degree or doctorate	0.4	0.4	0.0
All levels of education	0.6	1.3	-0.7

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA. See www.cbo.gov/publication/59970#data.

The labor forces consist of people who are currently employed in the sector or are unemployed after being laid off or losing their job in that sector for other reasons. The analysis excludes people who left their job, finished a temporary job, or have reentered the labor force.

a. The share unemployed for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

collected by the CPS during each month of 2022 instead of the more retrospective data collected in the Annual Social and Economic Supplement of the CPS in March. Workers were excluded from the analysis if they left their job voluntarily, because the consequences of such separation are less clear.¹ For example, workers might leave a job because they are likely to find one that pays more. In comparing job security among the remaining employees, CBO generally adjusted for differences in workers' observable attributes between the sectors but found it impractical to adjust for differences in firm size.²

1. CBO also excluded from this analysis workers who had reentered the labor force because it is unclear whether they had lost their job or left voluntarily. Including them would change the estimate of the difference in unemployment to about -0.9 percentage points.
2. Only the March CPS asks workers about the size of their employer. Other researchers have adjusted for firm size by using more years of CPS data, which covered an earlier period. They found that adjusting for firm size reduced their estimate of the amount of additional job security in the federal sector. See Andrew G. Biggs and Jason Richwine, *Comparing Federal and Private Sector Compensation*, Economic Policy Working Paper 2011-02 (American Enterprise Institute, June 2011), www.aei.org/publication/comparing-federal-and-private-sector-compensation.

Differences in Average Compensation From Unemployment

Because the average number of days of involuntary job loss in 2022 was small, the effect on average compensation was small in both sectors, so the difference in such unemployment had little effect on the difference in average compensation between the sectors.³ CBO's estimates of the difference in job security tend to be greater for workers with less education.

If the economy had been in a recession in 2022, then the effect of job loss on compensation probably would have been larger, particularly in the private sector. (The unemployment rate was unusually low in that year.) To check the robustness of its findings, CBO estimated job security in both sectors in 2010, when unemployment peaked at 10 percent in the wake of the 2007–2009 recession, and in 2017, the most recent year in which the unemployment rate was similar to CBO's forecast for average unemployment over the next 10 years, which is 4.4 percent. The difference in unemployment because of job loss between the sectors was about the same in 2017 as it was in 2022 but diverged more widely in 2010. On average, federal workers were unemployed because of job loss for 1.7 percent (or about

3. A modest portion of the loss in income from less compensation might be offset by an increase in benefits from unemployment insurance.

6 days) of 2010, and their private-sector counterparts were unemployed because of job loss for 5.0 percent (or about 18 days) of the year, which indicates that job loss reduced total compensation by about 3.3 percent less for federal workers than it did for their private-sector counterparts in 2010, on average. For federal workers, that additional job security was probably particularly valuable because job loss often leads to longer periods of unemployment during times of high unemployment, which can disproportionately increase financial hardship.

Other considerations also suggest that the difference in rates of unemployment between the sectors might understate the effect of additional job security on average compensation. The number of days that someone is unemployed does not capture the full reduction in compensation from job loss if that loss leads to lower-paying jobs in the future. Research on the private sector indicates that job loss leads to years of lower earnings (from a combination of fewer hours worked and lower wages), although the longer-term loss might be concentrated among workers who are not comparable to federal employees.⁴

Research further suggests that the CPS might understate unemployment because people who are working are more likely to respond to the survey.⁵ Such under-

4. Studies have found that mass layoffs lead to a lasting reduction in earnings, on average. See Marta Lachowska, Alexandre Mas, and Stephen A. Woodbury, “Sources of Displaced Workers’ Long-Term Earnings Losses,” *American Economic Review*, vol. 110, no. 10 (October 2020), pp. 3231–3266, <https://doi.org/10.1257/aer.20180652>; and Steven J. Davis and Till Von Wachter, “Recessions and the Costs of Job Loss,” *Brookings Papers on Economic Activity* (Fall 2011), www.brookings.edu/articles/recessions-and-the-costs-of-job-loss/. However, the limited evidence suggests that longer-term reductions in earnings are concentrated among workers with less than a bachelor’s degree. See Till von Wachter and Elizabeth Weber Handwerker, “Variation in the Cost of Job Loss by Worker Skill: Evidence Using Matched Data From California, 1991–2000” (draft, University of California at Los Angeles, December 2009), <https://tinyurl.com/3pw25hy6>.
5. One study interpreted inconsistency in the CPS as indicative of its understating unemployment. See Hie Joo Ahn and James D. Hamilton, “Measuring Labor-Force Participation and the Incidence and Duration of Unemployment,” *Review of Economic Dynamics*, vol. 44, no. 1 (April 2022), pp. 1–32, <https://doi.org/10.1016/j.red.2021.04.005>. However, another study concluded that the implications of those inconsistencies was unclear. See Alan B. Krueger, Alexandre Mas, and Xiaotong Niu, “The Evolution of Rotation Group Bias: Will the Real Unemployment Rate Please Stand Up?” *The Review of Economics*

reporting might lead to CBO’s estimates understating the amount of additional job security federal employees have. For example, if federal employees and their private-sector counterparts were equally likely to underreport unemployment, then such underreporting would reduce the estimate of the unemployment rate for federal employees less because it was lower to begin with.

Differences in Financial Hardship From Unemployment

Differences in average compensation do not entirely capture the effects of job security because unemployment was concentrated among a small group of workers in 2022. In both sectors, unemployment lasted about 40 weeks, on average, for workers who lost their job. Workers might place considerable value on even a small decrease in the chance of such an extended period of unemployment because of the financial hardship such periods can cause.

Researchers have measured the value workers place on avoiding the financial consequences of unemployment by estimating the amount they would pay for insurance that replaced their lost earnings in the event of unemployment. Recent research suggests that workers are willing to pay about \$1.50 for \$1 of unemployment insurance, on average.⁶ That means they would be willing to pay \$1.50 to avoid the prospect of job loss’ reducing their average total compensation by \$1. Thus, the value they place on additional job security is 50 percent larger than the increase in average compensation from a lower rate of job loss. Federal employees might value job security more than the workers examined in those studies because the additional job security in the federal sector could attract workers who are particularly averse to job loss.

Sources of Differences in Unemployment

The amount of time workers spend unemployed depends on how frequently they lose their job and how long they remain jobless. In 2022, federal employees spent less

and Statistics, vol. 99, no. 2 (May 2017), pp. 258–264, https://doi.org/10.1162/REST_a_00630.

6. Camille Landais and Johannes Spinnewijn, “The Value of Unemployment Insurance,” *The Review of Economic Studies*, vol. 88, no. 6 (November 2021), pp. 3041–3085, <https://doi.org/10.1093/restud/rdaa086>; and Nathaniel Hendren, “Knowledge of Future Job Loss and Implications for Unemployment Insurance,” *American Economic Review*, vol. 107, no. 7 (July 2017), pp. 1778–1823, <https://doi.org/10.1257/aer.20151655>.

time unemployed after job loss than their private-sector counterparts did because they were less likely to lose their job in the first place, CBO estimates. When they did lose their job, though, federal workers remained unemployed for about as long as their private-sector counterparts, on average.

One factor that probably contributes to the lower rate of job loss in the federal sector is the procedures that were established to reduce the extent to which federal employees are dismissed and replaced with supporters of newly elected officials. The Civil Service Commission was created in 1871 to select federal employees on the basis of their merit. It was replaced by the Office of Personnel Management and the Merit Systems Protection Board (MSPB) in 1978. Federal employees who have completed their probationary period (which is typically one or two years) can appeal their dismissal to the MSPB, an avenue not available to workers in the private sector. The lengthy and involved appeals process probably deters managers from attempting to dismiss employees, even those who perform poorly.⁷ However, it also probably reduces the extent to which federal employees are dismissed because of their ideologies or political affiliations.

Comparison of the Portion of Compensation That Is Deferred

The federal government defers more compensation until retirement than private-sector employers do, which might affect its ability to recruit and retain a highly qualified workforce. For workers at all levels of education, a larger portion of compensation is deferred for federal employees than for their private-sector counterparts, CBO estimates (see Table 4-2). The difference is larger for workers with less education and diminishes for workers with more education.

Overall, federal employees had 9.1 percent more of their compensation deferred in 2022 than private-sector employees. Nearly all of that difference stems from the federal government's higher spending on defined benefit pensions and health insurance in retirement (which account for 63 percent and 28 percent of the difference, respectively). Costs for the other types of deferred compensation—defined contribution pensions and the employer's share of payroll taxes for Social Security and Medicare—were only slightly larger for federal employees.

7. Eric Katz, "Firing Line," *Government Executive* (undated), www.govexec.com/feature/firing-line.

If the value workers place on the additional deferred compensation is less than the cost of that compensation to the federal government, then providing such compensation could increase the amount of total compensation the government decides to provide to attract and retain a qualified workforce. No study has looked at that issue for federal civilian employees, but a few studies have estimated the amount that military personnel and teachers were willing to pay up-front for larger defined benefit pensions.⁸ Those studies used interest rates to describe employees' preferences, deriving the minimum rate paid between up-front and deferred payments that would induce employees to prefer a larger pension in the future. In most cases, the estimated interest rates were higher than the one CBO used to estimate the cost of defined benefit pensions to the federal government (3.3 percent).

That research indicates that the cost to the government might not reflect an interest rate high enough to match the cost to the worker of having to wait for the deferred payments. Thus, if federal employees are similar to those workers in the interest rates they require, those findings tend to suggest that the value federal employees place on the additional spending on defined benefit pensions is less than the cost of that spending to the federal government, on average.

However, the studies also indicate that the value some workers place on those benefits exceeds the cost to their employer. If federal employment attracts many of that type of worker, then the average value placed on defined benefit pensions might be similar to the cost to the federal government. In 2021, 78 percent of federal

8. Shawn Ni, Michael Podgursky, and Fangda Wang, "How Much Are Public School Teachers Willing to Pay for Their Retirement Benefits? Comment," *American Economic Journal: Economic Policy*, vol. 14, no. 3 (August 2022), pp. 478–493, <https://dx.doi.org/10.1257/pol.20200763>; Curtis J. Simon, John T. Warner, and Saul Pleeter, "Discounting, Cognition, and Financial Awareness: New Evidence From a Change in the Military Retirement System," *Economic Inquiry*, vol. 53, no. 1 (January 2015), pp. 318–334, <https://doi.org/10.1111/ecin.12146>; Maria Donovan Fitzpatrick, "How Much Are Public School Teachers Willing to Pay for Their Retirement Benefits?" *American Economic Journal: Economic Policy*, vol. 7, no. 4 (November 2015), pp. 165–188, <http://dx.doi.org/10.1257/pol.20140087>; and John T. Warner and Saul Pleeter, "The Personal Discount Rate: Evidence From Military Downsizing Programs," *American Economic Review*, vol. 91, no. 1 (March 2001), pp. 33–53, <http://dx.doi.org/10.1257/aer.91.1.33>.

Table 4-2.

Deferred Compensation in the Federal and Private Sectors, by Workers' Educational Attainment, 2022

Percent

	Share of total compensation that is deferred		
	Federal government	Private sector ^a	Difference in shares
High school diploma or less	20.6	10.7	9.9
Some college	22.4	11.2	11.1
Bachelor's degree	21.1	12.2	8.9
Master's degree	20.6	12.6	8.1
Professional degree or doctorate	18.5	11.9	6.6
All levels of education	20.9	11.8	9.1

Data sources: Congressional Budget Office; Census Bureau, the Current Population Survey, from IPUMS-USA; Office of Personnel Management; Bureau of Labor Statistics. See www.cbo.gov/publication/59970#data.

Deferred compensation consists of the cost employers incur for defined benefit pensions, defined contribution plans, retirees' health insurance, and employers' share of payroll taxes for Social Security and Medicare.

a. The share of compensation that is deferred for private-sector workers who resemble federal workers in their occupations, years of work experience, and certain other observable characteristics likely to affect wages.

employees reported that the defined benefit pension had influenced their decision to accept a federal job.⁹

The pension plan offered by the federal government might not entice younger workers to accept federal employment because they would have to contribute to the plan for many years before receiving any benefits from it.¹⁰ For example, workers who joined the federal government at age 26 would have to remain in federal employment for 31 years and contribute 4.4 percent of their salary each year to qualify for an immediate pension. Most workers leave federal employment before then, in many cases choosing to have their contributions refunded to them instead of receiving a pension later in life.¹¹ Those workers are provided no compensation through the pension and are temporarily limited in how they can use the portion of their salary they contributed to it.

The effects of deferring more compensation (through the defined benefit pension and health insurance for retirees) on the quality of applicants for federal jobs is unclear. By making the compensation package less appealing to younger workers, the federal government effectively limits the talent pool it can recruit from. In that way, deferred benefits could decrease the quality of the workforce. By making the compensation package more appealing to workers who plan to stay with the same employer for many years, though, the federal government effectively reduces turnover and retains the expertise that those workers accumulate for more years. In that way, deferred benefits could increase the quality of the workforce.

Research suggests that the federal government's additional spending on defined benefit pensions boosts retention less than additional spending on wages would. One study found that a reduction made in 1984 to the formula for calculating federal defined benefit pensions decreased retention overall, which suggests that the additional spending on defined benefit pensions relative to amounts spent by the private sector probably increased retention.¹² However, that same study found that an increase in the General Schedule in 1991 boosted

9. Office of Personnel Management, *2021 Federal Employee Benefits Survey Report* (June 2022), <https://tinyurl.com/5h3j68ep>.

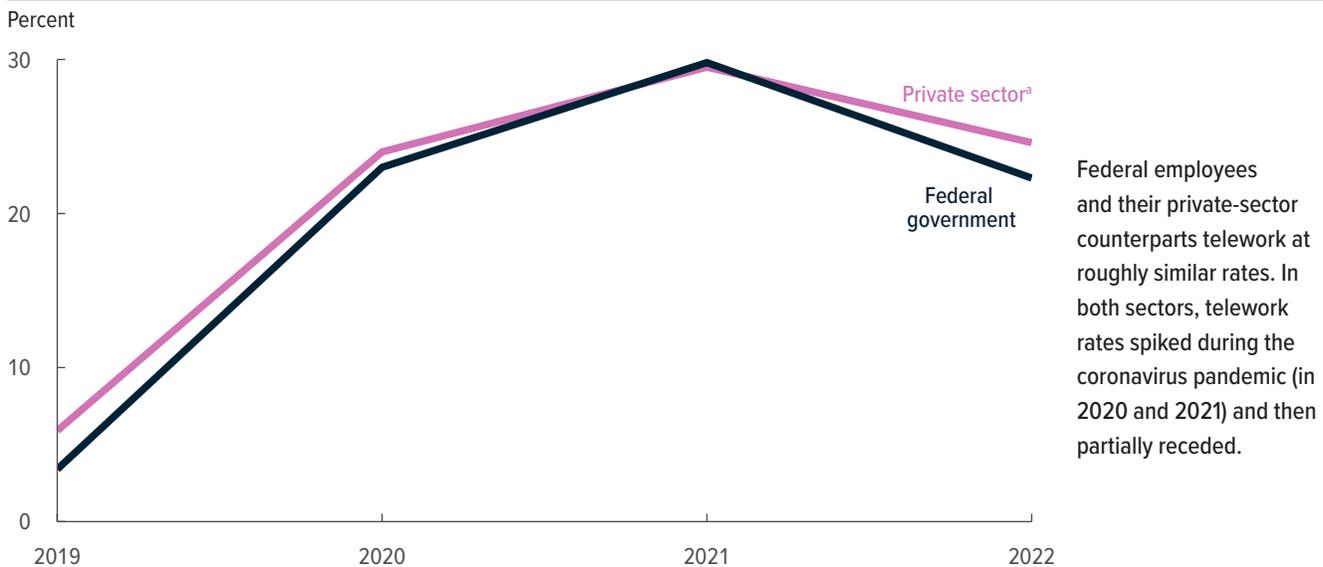
10. For a more detailed description of possible effects of defined benefit pensions on recruitment and retention, see Congressional Budget Office, *Options for Changing the Retirement System for Federal Civilian Workers* (August 2017), pp. 14–20, www.cbo.gov/publication/53003.

11. Office of Personnel Management, *Civil Service Retirement and Disability Fund Annual Report, Fiscal Year Ended September 30, 2022* (June 2023), <https://tinyurl.com/5y2pvv7h>.

12. Justin Falk and Nadia Karamcheva, *Comparing the Effects of Current Pay and Defined Benefit Pensions on Employee Retention*, Working Paper 2018-06 (Congressional Budget Office, June 2018), www.cbo.gov/publication/54056.

Figure 4-1.

Percentage of Employees Who Typically Work From Home, by Sector



Data sources: Congressional Budget Office; Census Bureau, the American Community Survey, from IPUMS-USA. See www.cbo.gov/publication/59970#data.

a. The telework rate for private-sector workers who resemble federal workers in occupation, years of work experience, and certain other observable characteristics that are likely to affect telework.

retention by more per dollar spent on compensation. Spending on pensions increases retention less, on average, because it reduces retention among workers who are eligible to immediately begin receiving benefits if they retire. Some of those workers would have given up more in immediate retirement benefits if they continued working for the government than they would have earned in future benefits.

Comparison of Working From Home

Most workers are willing to accept a job that pays less if it gives them the option to work from home.¹³ For that reason, providing more telework options might decrease the compensation that the federal government has to offer, relative to compensation in the private sector, to attract and retain highly qualified employees. (Providing fewer telework options would have the opposite effect.)

CBO used data from the American Community Survey (an annual survey conducted by the Census Bureau) to compare telework rates of federal employees and their

private-sector counterparts. Whereas the CPS has little data on telework, the American Community Survey asks workers how they “usually” get to work and provides “works from home” as one of the options respondents can select. Thus, the telework rates CBO estimated probably represent the percentage of workers that work from home most of the time, including those who always work from home.

In both sectors, telework rates nationwide spiked during the coronavirus pandemic (in 2020 and 2021) and then partially receded (see Figure 4-1).¹⁴ In 2022, CBO estimates, 22 percent of federal employees usually teleworked, as did 25 percent of their private-sector counterparts. The telework rate for the private sector would have been lower had CBO not adjusted for differences in employees’ education, location, and occupation. Telework was more common among more educated

13. Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis, *Why Working From Home Will Stick*, Working Paper 28731 (National Bureau of Economic Research, April 2021), www.nber.org/papers/w28731.

14. The Office of Management and Budget initially directed federal agencies to bring staff back to the office in June 2021. All 24 of the largest government agencies reported that they had completed their initial return to the office at some point during 2022. See Government Accountability Office, *Telework: Growth Supported Economic Activity During the Pandemic, but Future Impacts Are Uncertain*, GAO-23-105999 (July 2023), www.gao.gov/products/gao-23-105999.

workers in both sectors (except for workers with a professional degree or doctorate in the private sector, who teleworked less than private-sector workers whose education culminated in a bachelor's or master's degree). Furthermore, telework was more common in urban areas. In 2022, the rate of telework for employees in the Washington, D.C., metropolitan area, for instance, was 38 percent for federal employees and 40 percent for their private-sector counterparts, in CBO's estimation.

The ability to telework is highly dependent on occupation. In 2022, federal employees were more likely than workers in the private sector to serve in occupations in which telework was common. In the computer and mathematical occupations, which employed a larger portion of federal workers than private-sector workers in 2022, for example, teleworking was most common. The rates of telework for people in those occupations differed by sector, though—37 percent for federal workers, compared with 56 percent for their private-sector counterparts in 2022. One reason for the much higher telework rate for private-sector workers might be that federal workers are more likely to be required to go to the office to access sensitive data. Federal employees working as operations research analysts, for example (a common occupation in the Department of Defense that often requires a security clearance), are less likely to telework than their private-sector counterparts.

Federal employment was also common in some occupations in which telework was rare in 2022. Among federal workers in the areas of nursing, law enforcement, and transportation security screening, for example, the telework rate in 2022 was less than 10 percent—probably

because those occupations require frequent in-person interactions. By contrast, other occupations in which telework is rare (such as construction, production, and transportation) employ few federal workers.

Less teleworking overall among federal workers than their private-sector counterparts might have slightly reduced the appeal of working for the federal government in 2022. Limited evidence indicates that U.S. workers would be willing to give up about 8 percent of their salary, on average, to work from home about half the time.¹⁵ Other research has found that the ability to telework increased employee retention at a large technology firm.¹⁶ The telework rate was only about 2 percentage points lower for federal employees than for their private-sector counterparts in 2022, though, CBO estimates. That finding suggests that because only a small portion of federal employees would be able to telework more if they instead worked in a similar occupation in the private sector, the average effect of less telework on the appeal of federal employment was small.

15. Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis, *Why Working From Home Will Stick*, Working Paper 28731 (National Bureau of Economic Research, April 2021), www.nber.org/papers/w28731.

16. Nicholas Bloom, Ruobing Han, and James Liang, *How Hybrid Working From Home Works Out*, Working Paper 30292 (National Bureau of Economic Research, January 2023), www.nber.org/papers/w30292.

Appendix A: CBO's Analytic Approach

This appendix summarizes the analytic approach taken by the Congressional Budget Office to compare compensation in the federal government with that in the private sector in 2022. The approach is broadly similar to that used by CBO in its 2017 report comparing compensation in those sectors, although the analyses differ in several respects.¹

Summary of CBO's Approach

In both the federal government and the private sector, compensation may depend on more than a dozen factors that can be observed and measured. For this analysis, CBO adjusted for differences between federal and private-sector workers in the areas of education, occupation, years of work experience, geographic location (region of the country and urban or rural location), size of employer, veteran status, and certain demographic characteristics (sex, race, ethnicity, marital status, immigration status, and citizenship).² Those adjustments enabled CBO to compare the average compensation of federal workers with the average compensation of private-sector workers who have certain similar observable attributes. Of those attributes, education is especially important, so CBO reported comparisons for five levels of educational attainment: high school diploma or less, some college, bachelor's degree, master's degree, and doctorate or professional degree.

To analyze hourly wages of federal and private-sector employees, CBO used data for 2022 from the Current Population Survey (CPS), a monthly survey of households conducted by the Bureau of Labor Statistics (BLS) and the Census Bureau. The Annual Social and Economic Supplement for that survey contains a lot of information about the attributes and earnings (including salaries, overtime pay, tips, commissions, and bonuses) of randomly sampled federal and private-sector workers.³ CBO calculated hourly wages by dividing workers' annual earnings by the number of hours they say they worked. CBO limited the CPS sample to full-time, full-year workers, who accounted for about 95 percent of the total hours worked by federal employees in 2022.

CBO also analyzed the cost to employers of providing benefits and how it differed in the federal government and the private sector. As with wages, differences in benefits can stem from disparities in various factors, including attributes of employees that can be measured easily, attributes that cannot be measured easily, and the approaches used to determine compensation in the two sectors. The CPS does not include comprehensive information about employees' benefits. For that comparison, therefore, CBO supplemented the CPS with data on the benefits of private-sector workers from BLS's National Compensation Survey and with data on the benefits of federal workers maintained by the Office of Personnel Management (OPM).⁴

CBO adjusted the distribution of earnings of federal workers as reported in the CPS to match the distribution of earnings of federal workers as reported to OPM by federal agencies. The sample of people who report being full-time, full-year federal employees in the survey data from CPS represents about 2.7 million workers, whereas

1. Congressional Budget Office, *Comparing the Compensation of Federal and Private-Sector Employees, 2011 to 2015* (April 2017), www.cbo.gov/publication/52637. For more details about the method underlying both analyses, see Justin Falk, *Comparing Wages in the Federal Government and the Private Sector*, Working Paper 2012-3 (Congressional Budget Office, January 2012), www.cbo.gov/publication/42922, and *Comparing Benefits and Total Compensation in the Federal Government and the Private Sector*, Working Paper 2012-4 (Congressional Budget Office, January 2012), www.cbo.gov/publication/42923.

2. Such adjustments do not completely account for differences in occupations and work experience between federal and private-sector employees. Occupations are classified in 22 broad categories, which in some instances group federal and private-sector workers who do not perform similar duties. Experience is measured as the length of time that workers have been in the labor force, based on their age and education. That measure does not capture actual experience for people who may have been unemployed or out of the labor force, nor does it capture the relevance or quality of their work experience.

3. Because the sample includes only about 1,000 federal workers, the number of workers in each category of educational attainment for the federal workforce is small enough that the comparison would be imprecise if not supplemented by other data. CBO improved the precision of those estimates by using administrative data that cover most federal workers and by using earlier years of CPS data to inform the estimates (a process described in more detail later in this appendix).

4. OPM provided data from the Enterprise Human Resources Integration Data Warehouse Statistical Data Mart.

the data from OPM indicate about 1.7 million such federal employees. That discrepancy is typically driven by an overestimate of the share of federal workers with relatively low wages in the CPS. As a result, relying solely on the CPS data would lead CBO to underestimate average wages among federal employees without a bachelor's degree. To correct for that error, CBO used a statistical matching technique to adjust the distribution of earnings for federal workers in the CPS to match the distribution of earnings for federal workers in the data from OPM.⁵ Those adjustments reduced the number of federal workers in the CPS with low wages.

The data from BLS and OPM were used to calculate the relationship in each sector between employees' wages and the benefits that employees receive. CBO then used those relationships to estimate benefits for the workers surveyed in the CPS, on the basis of their wages and the sector that employed them. Using those estimates, CBO compared the average cost of benefits for federal and private-sector workers at the five levels of educational attainment, making adjustments for the other factors measured in the CPS (such as occupation, years of work experience, demographic traits, location, and size of employer).⁶

That approach allowed CBO to compare the benefits of federal employees with those of private-sector employees who have certain similar job-related attributes—an analysis that would not be possible with the data that other researchers have used to compare benefits. CBO's estimates of the differences in benefits between the two sectors are more uncertain than its estimates of the differences in wages. That greater uncertainty reflects the complexity of measuring benefits and the extrapolations that were necessary to integrate the various data sets.

5. More specifically, CBO adjusted the relative weights placed on those workers using methods from Nicole Fortin, Thomas Lemieux, and Sergio Firpo, "Decomposition Methods in Economics," in Orley Ashenfelter and David Card, eds., *Handbook of Labor Economics*, Volume 4A (Elsevier, 2011), pp. 1–101, <https://tinyurl.com/ja9gdjy>. In addition to adjusting the data to match the distribution of earnings, CBO matched the distributions of age, sex, race, and ethnicity.

6. CBO used a similar process to compare the portion of compensation that is deferred between the sectors.

Differences Between the Approach CBO Used in This Report and the One Used in Its 2017 Report

For this report, CBO changed the way it compares pay to improve the precision of the estimates. In this report, CBO compares average pay for one year—2022—to avoid incorporating the temporary effects of the coronavirus pandemic. By contrast, the 2017 report compared pay averages over a five-year period.

In 2022, about 1,000 federal workers and 26,000 private-sector workers responded to the Annual Social and Economic Supplement of the CPS. If CBO had solely used those data, the sample sizes would have been small for federal employees in most of the educational categories. So CBO used supplemental data from 2018 through 2022 to estimate compensation in 2022 and assumed that the percentage differences in pay among federal workers with different amounts of education remained constant across those years.

The estimates' precision is thus improved because those differences are based on five years of data, and the adjustment for pay growth in 2022 is based on data for all levels of education. CBO also improved the precision of the estimates by adjusting the distribution of earnings for federal workers as reported in the CPS to match the distribution of earnings for federal workers as reported to OPM by federal agencies.

CBO's comparisons, despite being estimated from multiple years of data, appear to accurately represent differences in pay in 2022. One concern with CBO's approach is that the differences in federal pay by education level may not have remained constant across years. Analyses of both the CPS and OPM data indicate that those differences changed little from 2018 through 2022, however. Another concern is that the pay comparisons may reflect the temporary effects of the pandemic. CBO examined the implications of using data from 2020—the height of the pandemic—in its estimates of average compensation for 2022 by exploring how those estimates changed when the data from 2020 were excluded. The agency found that the estimates changed little, which suggests that CBO had already mitigated any temporary effects of the pandemic by basing the estimates on the characteristics of federal employees in 2022. (Although CBO used data from 2018 to 2022 to calibrate its model, the agency just used the data for 2022 to calculate estimates from that model.)

Appendix B: Federal Compensation

The federal government compensates its employees with a mix of wages and benefits. Wages, which are mostly determined by various salary schedules, depend on an employee's job description, qualifications, experience, performance, location, and other factors. Some benefits (such as pensions and paid leave) are determined mainly by formulas that depend on a worker's annual salary or hourly wage, his or her years of service, and legal requirements that affect all employees in the public and private sectors; other benefits (such as health insurance) are largely unrelated to those factors.

The schedules and formulas that govern federal employees' compensation stem from classifications, guidelines, and laws enacted over many decades, including the Classification Act of 1949 and the Federal Employees Pay Comparability Act of 1990. The latter law states that federal salaries should be set at rates that are comparable with nonfederal salaries "for the same levels of work within the same local pay area."¹

Wages

For most federal employees, salaries or wages are determined by their rank in a pay schedule.² Although salaries and wages are both forms of cash compensation, they differ somewhat. Salaries refer to a fixed amount of money that a worker is scheduled to make over a year as long as he or she works enough hours to avoid taking unpaid leave. The Congressional Budget Office calculates wages as the amount of money the worker earned divided by the number of hours for which he or she worked or took paid leave over the course of the year.

The salaries of about 60 percent of federal workers are based on the General Schedule, which consists of 15 pay grades—each with 10 pay levels, or steps—for 53 metropolitan areas. Cash compensation for other federal employees is based on various other pay systems. Some of

those systems—such as the Federal Wage System, which covers about 8 percent of federal workers—are similar to the General Schedule; other systems differ more. The Transportation Security Administration, the Internal Revenue Service, and several other federal agencies use performance-based pay systems. Those systems typically give managers more discretion in setting an employee's wages, within the confines of ranges that are determined by the employee's job classification.³

The salary for any particular worker covered by a federal pay schedule depends on the characteristics of the job and of the person filling it. Job classifications—such as statistician or nurse—are linked to different grade levels, so wages and salaries are determined by the requirements of the job. Employees' qualifications and experience also influence their rank in a pay schedule. Over time, individual employees routinely move to higher levels of pay by advancing through their pay schedule on the basis of their experience and performance.⁴ Employees who perform well can advance more quickly than average, and employees who perform poorly can be denied such step increases, but almost all federal workers compensated under pay schedules move to progressively higher grades as they are eligible. That system ensures that employees in the same type of job who have similar tenure receive similar pay, but it limits managers' flexibility to reward workers who perform well or to constrain the salaries of workers who perform poorly.

Benefits

Like many employers in the private sector, the federal government also compensates its workers with non-cash benefits, such as income during retirement, partial

1. Federal Employees Pay Comparability Act of 1990, 5 U.S.C. §5301 (2012).

2. Federal workers are also eligible for cash awards and retention allowances, but such incentives typically account for a small portion of their total wages.

3. For a complete list of agencies that use performance-based pay systems, see Ginger Groeber and others, *Federal Civilian Workforce Hiring, Recruitment, and Related Compensation Practices for the Twenty-First Century* (RAND Corporation, 2020), www.rand.org/pubs/research_reports/RR3168.html.

4. Federal pay systems are discussed in more detail in Congressional Budget Office, *Characteristics and Pay of Federal Civilian Employees* (March 2007), www.cbo.gov/publication/18433.

payment of health insurance premiums, paid leave, legally mandated benefits, and other benefits.

Retirement Income

Almost all federal workers participate in the Federal Employees Retirement System (FERS) or the Civil Service Retirement System (CSRS). In this analysis, estimates of the cost of federal pension benefits focus on FERS, which covers about 98 percent of current federal employees who work full time and almost all such employees newly hired by the government. People who began federal employment after 1983 are not eligible to participate in CSRS, which was replaced by FERS. Under both systems, the government provides most of the funding for an employee's pension, and the amount of the pension depends on the employee's salary, length of federal service, and age at retirement. Federal workers may also participate in the Thrift Savings Plan (TSP), which is similar to 401(k) accounts in the private sector. For employees covered by FERS, the federal government matches a portion of their contributions to their TSP accounts. The government does not match those contributions for workers covered by CSRS.

Health Insurance

Most federal workers are eligible to buy health insurance through the Federal Employees Health Benefits program, and many federal retirees are eligible to retain that coverage in retirement. On average, the government pays about 71 percent of the cost of health insurance premiums for current workers through that program.⁵

Paid Leave

Most federal employees qualify for four types of paid leave:

- Annual, or vacation, leave (between 13 and 26 days per year depending on an employee's length of federal service);
- Sick leave (13 days annually);
- Holidays (11 each year); and
- Parental leave in the event of childbirth or adoption (12 weeks).⁶

Legally Mandated Benefits

The federal government, like private-sector employers, is required to pay for certain legally mandated benefits for its current workers. Both the government and its employees pay payroll taxes for Social Security, Medicare, workers' compensation, and unemployment benefits. (Many of the federal employees who participate in CSRS do not accrue Social Security benefits and do not pay Social Security payroll taxes; likewise, the federal government does not pay Social Security taxes for those workers.)

Other Benefits

The federal government and some employers in the private sector provide other types of benefits, such as disability insurance, life insurance, and subsidies for employees' education or commuting expenses. In addition, there are other benefits that only the federal government provides (such as the often above-market rate of return offered to employees through the G fund, one of the investment options in the federal retirement plan) or that are primarily provided by private-sector employers (such as stock options). All of those benefits are typically less costly than retirement benefits, health insurance, paid leave, and legally mandated benefits. (Estimating the cost of those smaller benefits is beyond the scope of this analysis.)

5. Specifically, the government pays the lesser of 72 percent of the weighted average premium for all plans or 75 percent of the premium for the plan an enrollee chooses.

6. Lawmakers added the 11th federal holiday, Juneteenth National Independence Day, and began providing 12 weeks of parental leave after the publication of CBO's previous comparison of federal and private-sector compensation.

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About This Document

This Congressional Budget Office report was prepared at the request of the Chairman of the House Committee on Oversight and Accountability. In keeping with CBO's mandate to provide objective, impartial analysis, this report makes no recommendations.

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CBO seeks feedback to make its work as useful as possible. Please send comments to communications@cbo.gov.



Phillip L. Swagel
Director
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