

Pensions in the Public Sector

Edited by

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Chapter 4

Federal Civilian and Military Retirement Systems

Edwin C. Hustead and Toni Hustead

In this chapter we describe the retirement systems that apply to civilian employees and military personnel of the U.S. federal government. More than one out of every twenty Americans are or will be entitled to benefits under one of the federal retirement systems. These are not only the largest retirement systems in the United States, but they also supply an important part of total retirement income now and will continue to do so in the future.

The most important federally run civilian systems are the Civil Service Retirement System (CSRS) for employees hired before 1984, and the Federal Employees Retirement System (FERS) for employees hired after 1983. Employees in both systems have been eligible to participate in the Federal Thrift Savings Plan (TSP) since 1987. Most military personnel are covered by the military retirement system—an informal name for a complex of evolving plans that have merged over time and cover officer and enlisted members of the uniformed services. Prior to 1980, the military retirement benefit formula provided a benefit of 50 percent of final basic pay, but benefits were reduced in 1980 and again in 1986. As is true for state systems, the new military and civilian benefit rules apply only to personnel entering service after the date of the change.¹

Some 97 percent of federal participants are included either in the CSRS/FERS program or the Defense Department's military retirement system, though there are still many (thirty-three) small retirement systems that also fall under the federal plan heading. The number of plans and active participants in federal plans is summarized in Table 1. Some systems, such as those covering the foreign service and judiciary, were established to fit specific types of employment. Other plans, such as Tennessee Valley Authority and Coast Guard, were outside the authority of the sponsors of the pri-

TABLE 1. Employees in Federal Retirement Systems (1993)

<i>Type (number of plans)</i>	<i>Type of employee covered</i>	<i>Employees covered</i>
<i>Civilian retirement systems</i>		
Primary civilian systems (2)	Postal Service—general	683,000
	Hazardous duty	78,000
	Members of Congress	500
	Congressional staff	21,000
	Military reserve technicians	38,000
	Air traffic controllers	26,000
	Other general	1,996,500
	Total	2,843,000
Foreign service retirement systems (2)		12,000
Judicial retirement systems (7)		2,000
Tennessee Valley Authority (1)		19,000
Federal Reserve and other bank systems (11)		35,000
Nonappropriated fund systems and other (9)		55,000
Subtotal (32)		2,966,000
<i>Military retirement systems</i>		
Department of Defense (1)		2,750,000
Coast Guard (1)		55,600
Public Health Service (1)		6,000
National Oceanic and Atmospheric Agency (1)		400
Subtotal (4)		2,812,000
Total federal (36)		5,778,000

Source: U.S. General Accounting Office (1996), Office of Personnel Management Office of Actuaries.

mary civilian and military retirement systems. Table 1 also shows that, within CSRS/FERS, there are special benefits for certain categories of participants. These include hazardous duty employees (such as Federal Bureau of Investigation agents), air-traffic controllers, and members of Congress. The special treatment of employees of the District of Columbia government in CSRS is described in Hustead (this volume).

Almost all the civilian retirement systems are financed on a sound actuarial basis. The major exception is CSRS, which had an unfunded liability of \$504 billion in 1998 and only a portion of the liability is being amortized. The primary military retirement system had an unfunded liability of \$498 billion in 1998 but the liability is being fully amortized. The other three military retirement systems are on a pay-as-you-go funding basis.

The Structure of Federal Civilian Employee Retirement Systems

Most U.S. federal civilian employees participate in the CSRS and the FERS. The CSRS was established in 1920, before social security, and it was the natural child of the Civil Service Act of 1883, a law that protected employees from arbitrary dismissal for any reason including age. As a consequence, by 1920, there were many federal employees age 70 or older who could not be separated from service. CSRS offered a legal basis for separating those employees and the income necessary to support them after retirement. The original Social Security Act of 1935 excluded government workers, mainly because most had their own retirement plans. Over time, social security coverage was gradually extended to government workers, and new hires in the federal sector were brought in after 1983 (Crane this volume).

Reasons for two systems and choice. Defined benefit pension plans like CSRS that began in the first half of the twentieth century were designed to provide reasonable retirement income for the long-career employee. Below we provide more detail on the program, here it suffices to note that the CSRS benefit is based on service times the high three-years average salary, with a benefit accrual rate of 1.5 percent of pay for the first five years of service, 1.75 percent of pay for the next five years, and 2 percent of pay for each additional year. Many federal employees at that time would work a full career for the government, so the CSRS approach followed the pattern prevalent in so many defined benefit plans developed at the time, offering long-term workers high benefits, but low benefits to short-career employees. In particular, benefits for short-service younger terminating employees have little value by age 62 because there is no inflation protection before age 62. In fact, most terminated vested employees only receive a return of their own contributions.

Extension of social security to federal employees hired after 1983 necessitated the development of a new federal retirement system. Simply adding social security to CSRS would have resulted in unreasonably high benefits and cost to both the federal government and federal employees.

FERS is a three-part retirement system with benefits flowing from (a) a defined benefit plan, (b) a defined contribution plan, and (c) social security. At the time that FERS was under development, defined contribution plans had become very popular in the private sector. This popularity derived from the rapid growth of 401(k) plans, which in the private sector permitted the deferral of taxes on contributions and investment income. Although some wanted FERS to be only a defined contribution system, others favored only the defined benefit approach. The resulting FERS design incorporated both a defined benefit and a defined contribution approach. One constraint on plan design was that FERS should not cost any more than

CSRS. FERS was launched in 1987, retroactive to 1984 for those covered by social security.

Employment patterns when FERS was being designed differed sharply from those pertinent in the 1920s when CSRS was developed. Increased job mobility, downsizing, and reduced job security in recent years produced a federal workforce with employees who were more likely to work for many employers than to spend a full, or even a majority, of a career with one employer. As a consequence, FERS was intended to provide more portable benefit accumulations than CSRS. Career workers still receive the highest benefits, but young short-service FERS workers can expect to take a much greater share of the retirement benefits with them than CSRS workers with the same age and service. This is particularly evident for workers leaving prior to retirement.

CSRS employees with over five years of service at separation (before retirement) can choose between a vested benefit payable at age 62 and a refund of their contributions, without interest. Most separating employees take the lump-sum refund, thereby losing money to the retirement system. CSRS employees also lack social security coverage. By contrast, the employee covered by FERS has social security credits that are fully portable, and separating employees with ten or more years of service may receive reduced benefits payable at age 55 rather than at age 62. Terminating employees are also offered a choice of a refund of contributions with interest or the deferred vested benefit in the FERS plan. But unlike in CSRS, FERS-covered employees who take the refund do not have an opportunity to redeposit the refund and receive credit for the prior service if they reenter federal service.²

Participants in CSRS/FERS and in many of the other civilian retirement systems may also choose to participate in the federal TSP, which is a defined contribution plan (about which more is said below). CSRS employees can contribute up to 5 percent of pay to TSP, with no matching employer contribution. FERS employees can contribute up to 10 percent of pay, with the government contributing up to an additional 5 percent of pay. The TSP began to collect and invest contributions in 1987, and most of the TSP contributions are fully vested.

Historically, salaries paid to federal employees have been lower than for similar positions in the private sector. The higher value of benefits, particularly the retirement benefits, somewhat offsets the low salary level. A Hay Group study found that FERS retirement benefits were worth 15 percent of salary, as compared to 9 percent for other large employers. That study also found that total federal benefits were 52 percent of salary compared to 48 percent for large employers (Hustead 1995).

Transfers from CSRS to FERS. CSRS employees have been provided with two opportunities, or "open seasons," during which they could transfer out of CSRS and into FERS. The first occurred in 1987 when FERS began, and the

second was in 1998. Employees who transferred from CSRS to FERS would be covered by social security and the FERS defined benefit system, and they would receive matching contributions to the TSP after the date of transfer. The CSRS benefit formula would continue to apply for service to the date of transfer. The federal Congressional Budget Office (CBO) projected that some 40 percent of CSRS employees eligible to transfer to FERS in 1987 would have been better off by making the switch, but in fact only 5 percent eventually transferred (CBO 1986). We estimated that around 25 percent of those in CSRS would have been better off under FERS, but only 2 percent transferred.

Past experience suggests that employees usually exhibit inertia and favor their current plan when offered a choice between an old and a new retirement system. For this reason it could have been anticipated that the actual transfer rates would have been lower than the 40 and 25 percent predicted by simply comparing the relative economic value of the two systems. Nevertheless, these transfer rates were probably too low to simply reflect inertia. Other explanations that may be offered include employee concerns about trading half of a guaranteed defined benefit for what they saw as risky income from social security and the TSP. Concern about social security was partly attributable to general public skepticism about the future of social security, and also to longstanding federal union opposition to social security coverage. Additionally, many CSRS employees were unsure about whether they would remain in government service until they were eligible for full retirement benefits. This was important since many employees would have been better off under FERS if they planned on leaving government employ prior to age 55, but would have been better off under CSRS had they been able to remain until age 55. Finally, many CSRS employees erroneously saw the open seasons as part of a plan by the government to move the workforce to FERS as quickly as possible. In fact, since most employees who transferred did so for improved benefits, the net result of each of the open seasons was to increase retirement costs for the government.

The distrust of FERS was clearly evidenced in a number of counseling sessions provided by the authors during the two open seasons. In many cases, FERS was clearly the better system for the individual but the distrust of the new system and the perceived motivations of the employer kept the individual from making the favorable economic decision to transfer to FERS. In extreme cases, individuals lost over \$100,000 by not transferring to FERS.

Even with the small number of transfers during the two open seasons, FERS has grown into the dominant program as a result of its jumpstart in 1987 (it included all hires since 1983), natural attrition, and subsequent new hires. As of the end of 1998, FERS payroll exceeded half of the total covered payroll, and Board of Actuaries of CSRS/FERS estimates that, by 2015, over 95 percent of employees will be covered by FERS.³

The Civil Service Retirement System

We turn next to a discussion of CSRS benefit rules and program financing.

*CSRS benefit formulas and rules.*⁴ The CSRS uses an accrual rate based on service times the employee's high-three years average salary. The accrual rate is 1.5 percent of pay for the first five years of service, 1.75 percent of pay for the next five years, and 2 percent of pay for each additional year. The maximum benefit is 80 percent of the high-three average salary. Benefits are paid in full to employees retiring at age 55 with thirty years of service, at age 60 with twenty years of service, or at age 62 with five years of service. There is no mandatory retirement age. Employees who leave before completing five years of service can receive a refund of their contributions with interest. Those who leave with five or more years of service, but before meeting one of these retirement conditions, can either withdraw their contributions without interest, or receive a benefit beginning at age 62. The lower benefit (i.e., refund without interest) for vested employees compared to non-vested employees is a result of a series of legislative actions. When five-year vesting was introduced vested employees were not permitted to withdraw their contributions at all. The government recognized that the deferred benefit was usually more valuable than the employee contributions so that a withdrawal of contributions in lieu of those benefits would result in a loss of system income.

The surge in federal employment that occurred during the Great Depression and World War II was followed by a reduction in employment after the war ended. Many of the employees then leaving CSRS had more than five years of service and complained about the restriction on withdrawing their own contributions. Congress reacted to this pressure by permitting withdrawal of contributions, but left a disincentive by not including interest on those contributions. In practice, unfortunately, few vested separating employees are deterred by the lack of interest credit. The result is that most vested employees actually receive less than what their own contributions would have earned if they had been invested elsewhere.

CSRS provides retirement credit for military service, unless the employee is already receiving a military retirement benefit. Retirement credit is also provided for unused sick leave at retirement; this is applied after the 80 percent limit and, therefore, can result in a benefit greater than 80 percent. Benefits are paid if the employee is disabled, to the degree that he or she is unable to perform his or her job. The disability benefit is usually the greater of the accrued retirement benefit and 40 percent of salary.⁵ The disability benefit is discontinued if (a) the employee is found to have recovered through a medical examination, (b) the employee earns 80 percent of the salary on the former job, or (c) the employee is reemployed by the federal government. Benefits for disability resulting from Federal service are

paid through the Office of Workers' Compensation Programs (OWCP). A disabled employee receives the higher of CSRS or OWCP benefits.

Benefits are paid to a surviving spouse and children as well as certain former spouses if the employee dies in service. The surviving spouse benefit is 55 percent of the disability benefit. For instance, the surviving spouse of a young short-service employee receives a benefit of 22 percent (55 percent of 40 percent) of high-three salary. Additional lump sum benefits are paid through the Federal Employees Group Life Insurance (FEGLI) program.

Survivor benefits after retirement are available in exchange for a reduction in the retiree's benefit. The reduction is 2.5 percent of the first \$3,600 in annual benefit and 10 percent of the benefit above \$3,600. The survivor benefit is 55 percent of the retirement benefit before the reduction. This differs from the private sector practice of basing the survivor benefit on the reduced retirement benefit. The retiree can elect to provide a benefit on a lower portion of the annuity, or to provide no survivor benefit, but this election must be agreed to by the spouse. If the spouse predeceases the annuitant, the reduction to pay for the benefit ceases and the annuitant can later provide benefits to a second spouse by accepting a reimposition of the reduction.

All benefits are fully indexed to inflation using the same increase formula as under social security. This formula provides an increase every January based on inflation in the previous year, through the third quarter of the prior year.

CSRS employees are not covered by social security during their federal service. If the employee is entitled to social security benefits through other service, or through a spouse, the social security benefits can be reduced through one of two offset provisions. (HayGroup 1999).

Financing CSRS benefits. CSRS is partially financed through a payroll tax totaling 14 percent, flowing from employee and employee contributions of 7 percent of salary each. These contributions were increased temporarily beginning in 1999, by as much as 0.5 percent, to reduce the federal deficit; the contributions will revert to 14 percent after 2001. Nevertheless, the 14 percent of salary contribution falls far short of the CSRS normal cost,⁶ which is 24.2 percent of salary. Each year's shortfall is added to prior shortfalls and interest on past shortfalls, to create a substantial unfunded liability (U.S. Office of Personnel Management [OPM] 1999a).⁷

The annual shortfall in CSRS financing is met through direct government payments, which amortize part of the increased liability attributable to salary increases, benefit liberalizations, and cost-of-living adjustments. It also must be noted that for financing purposes, CSRS liabilities are determined on a "static" basis that does not include projection of future inflation. As a result, current total contribution levels fall short of fully financing

the long-term CSRS benefits. The CSRS Board of Actuaries determines and publishes a static unfunded liability as the basis to determine the required government payment; this board also determines and publishes a "dynamic" liability that considers the effect of future inflation, as its best estimate of the actuarial status of CSRS (OPM 1999a).

It is projected that the CSRS account will fall to zero in 2026, triggering transfers of FERS funds to pay CSRS annuities after 2026. Thus CSRS financing problems are slated to be covered through a fund transfer from FERS to CSRS, when the CSRS account is depleted, as shown in Figure 1. This Byzantine approach to financing of CSRS is a product of the legislative history of CSRS. Until 1969, the only financing of CSRS had been through the employee and agency normal cost, then at 6.5 percent of payroll. The employee and agency contributions fell short of even the static cost of CSRS and, of course, fell far short of the full cost of CSRS including inflation.

The financial basis of the CSRS was overhauled in 1969. First, the combined employee and agency contribution was increased to approximately equal the static normal cost of CSRS. Second, additional government payments would be made to finance the remaining static liability, but this level of financing was to be phased in over a period of years. Both the static liability and the gradual phasing in of the new financing were selected as a compromise to limit the impact on the budget. At the time the changes were being debated, federal budget rules showed all increases in federal payments as increases in the federal deficit. Now, government financing of the CSRS unfunded liability costs occurs as an intergovernmental transfer with no impact on the overall measured federal deficit. Ironically, the move to the current budget scorekeeping, which would have removed the controversy from the level of CSRS financing, took place before the first additional government payment under the 1969 CSRS law. If current budget scorekeeping rules had been in effect in the 1960s, the CSRS system would undoubtedly be funded on the same sound actuarial basis as FERS.

Even with inadequate financing, projections of the CSRS fund showed that there would always be sufficient cashflow to pay benefits and live within a small fund balance. In effect, benefits for current annuitants would be paid primarily through income from employees and taxpayers. The reforms in 1969 did add a reserve cushion to CSRS financing, rather than relying solely on pay-as-you-go financing, but even in steady state, the fund would still have been far below the financing level required of private sector retirement plans.

Unfortunately, any prospects for a steady state were dashed with the introduction of FERS, since CSRS then lacked the needed continuous flow of new entrants. The government's solution to this problem was to use FERS income to pay for CSRS shortfalls. The amount borrowed from FERS would

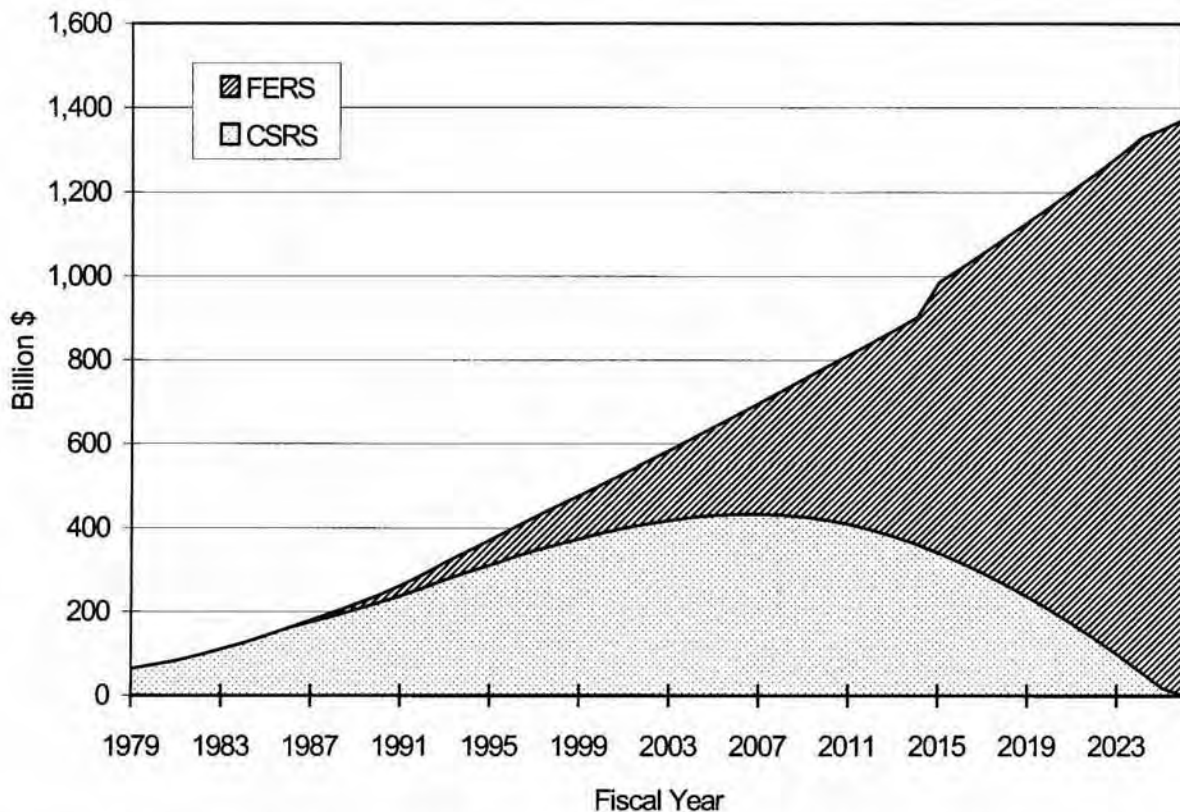


Figure 1. Combined CSRS/FERS fund balances. Sources: OPM (1999a) and data supplied by OPM Office of Actuaries.

be financed through 30-year payments beginning with each year's shortfall. Figure 1 shows the Board of Actuaries' projections that the shortfall will begin in 2026.

As of September 1998, OPM reported that total CSRS liabilities were \$962 billion, assets were \$361 billion, and the present value of future contributions was \$97 billion, for a net unfunded liability of \$504 billion. Plan assets were equal to 6.6 times CSRS payroll of (\$54.4 billion) and the unfunded liability was 9.3 times payroll. These determinations were made on a dynamic basis that includes the effect of future inflation (OPM 1999a).

In fiscal year 1998, CSRS employer and employee contributions were \$33.0 billion and investment income was \$25.8 billion for total income of \$58.8 billion. Payments to CSRS annuitants totaled \$41.9 billion of the total expenditures of \$42.3 billion. The annuitant payments were 77 percent of the active participant payroll. The net result was an increase in the CSRS account of \$16.5 billion, to \$360.6 billion on September 30, 1998. CSRS covered 1,100,000 employees and paid benefits to 2,290,000 retirees and survivors (OPM 1999a).

Figure 2 shows the increase in income and outgo of the CSRS/FERS Fund from 1979 through 2011. While both are growing, income exceeds outgo in all years; this will ensure a growing and viable total fund.

The Federal Employees Retirement System

We turn next to a discussion of FERS benefit rules and program financing.

FERS benefit formulas and rules. The basic FERS benefit is 1 percent of high-three average salary per year of service, with no maximum on the benefit. As with CSRS, the benefit is payable upon achieving one of three eligibility requirements. Two of these, age 60 with twenty years of service and age 62 with five years of service, are the same as under CSRS. However, employees with 30 years of service must have reached a minimum retirement age (MRA). This age is 55 for employees born prior to 1948, age 56 for those born from 1953 to 1964, and age 57 for those born after 1969. The age increases at 0.2 years per calendar year between 1948 and 1953, and between 1964 and 1969.

FERS, unlike CSRS, provides reduced early retirement benefits. Employees who have reached MRA with ten, but fewer than thirty, years of service, can retire and receive a benefit reduced 5 percent a year under age 62. Employees who leave before MRA, with more than ten years of service, can elect the reduced benefit when they reach MRA. Employees can also receive a return of contributions plus interest in lieu of benefits. However, FERS employees who elect a return of contribution cannot receive credit for that service if they later return to federal employment.

Disability benefits are payable under the same conditions as CSRS, but

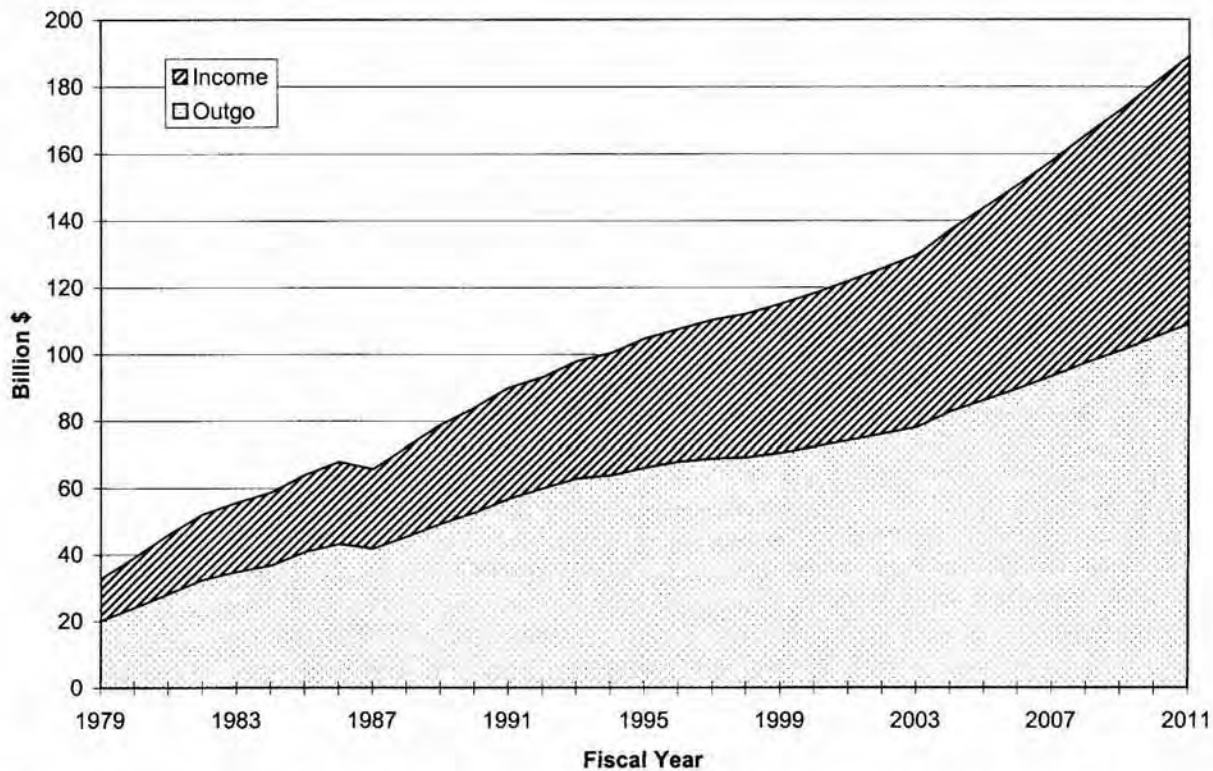


Figure 2. Combined CSRS/FERS funds income and outgo. Sources: OPM (1999a) and data supplied by OPM Office of Actuaries.

with a design that is closer to the long-term disability approach common in the private sector. For the first year of disability, the benefit is 60 percent of high-three salary, less social security. After the first year, the benefit is 40 percent of high-three pay, less 60 percent of social security. After age 62, the annuitant receives the lesser of the pre-age-62 benefit, and a recomputed normal retirement benefit. The normal retirement benefit is computed based on service including the period of disability and a high-three salary projected from the time of disability by inflation. The interaction with OWCP benefits is the same as for CSRS.

There are two benefits payable to survivors of active employees. The first is a lump sum payment, approximately equal to a year's salary, for employees who die after 18 months of service. In addition, a surviving spouse of an employee who dies with more than 10 years of service receives an annuity equal to 50 percent of the accrued FERS retirement benefit at the date of death. FERS employees are also eligible for Federal Employees Group Life Insurance benefits.

Retirees can elect to provide survivor benefits by taking a 10 percent reduction in their benefits. The survivor benefit is 50 percent of the retiree's benefit before the 10 percent reduction. Retirees can also choose a 25 percent benefit or waive the benefit entirely but any choice other than the full 50 percent benefit must be agreed to by the spouse.

Financing FERS benefits. FERS is financed through employee contributions of 0.8 percent of salary with the employer contributing the balance of the normal cost. As with CSRS, these employee and agency contributions were increased temporarily beginning in 1999 by as much as 0.5 percent to reduce the Federal deficit. After 2001, employee contributions will revert to 0.8 percent. The current normal cost is 11.5 percent of salary, so the employing agency contributes 10.7 percent. Unfunded liabilities are amortized over thirty years.

The employee contribution was set at 0.8 percent so that the total contribution rate for social security (currently 6.2 percent of salary) and FERS combined was equivalent to the employee's 7 percent of salary in the CSRS. The total retirement contribution drops to 0.8 percent when social security contributions cease at the maximum taxable wage base (\$76,200 in 2000). This lower contribution for higher-paid employees partially offsets two features of the FERS system that favor lower paid employees. One is the tilt in the Social Security benefit design that provides a larger share of replacement income to lower paid employees. The second is the limit on employee contributions to the TSP.

Today there are more FERS than CSRS employee participants, but relatively few retirees are currently receiving benefits; almost all contributions are currently used to build the FERS account. In fiscal year 1998, employer and employee contributions were \$7.2 billion and investment income was

\$6.8 billion, for total income of \$14.0 billion. FERS annuity payments amounted to \$0.8 billion, of the \$0.9 billion total expenditure. Benefit payments were 2 percent of the total FERS payroll of \$55.2 billion. The net result was an increase in the FERS fund of \$13.1 billion in fiscal year 1998 to \$97 billion in September 1998. FERS covered 1,547,000 employees and paid benefits to 106,000 retirees and survivors (OPM 1999a).

FERS, unlike CSRS, has been fully financed since it began in 1987. The total employer and employee contribution is set equal to the normal cost, which is determined using realistic economic assumptions. Any losses that arise due to adverse experience must be amortized over thirty years. Before 1996, FERS had built up a small unfunded liability because of losses. However, as of September 1996, the plan showed a small surplus, which was preserved by the Board of Actuaries. That group affirmed that a surplus could be held against future losses rather than credited over a thirty-year period, but at the same time that group confirmed that a net surplus would cancel all outstanding amortization payments. As a result, there are currently no FERS payments beyond the normal cost. The transfers from FERS to CSRS to cover the shortfall in financing beginning in 2026 will each be amortized over thirty years. As a result, OPM projects future amortization payments beginning in that year and ending thirty years after the last transfer of funds to CSRS.

As of September 1998, the Office of the Actuary of OPM determined that total FERS liabilities were \$191 billion, assets were \$97 billion, and the present value of future contributions was \$103 billion for a funded surplus of \$8 billion. This surplus will be held as a cushion against future losses. Assets were 1.8 times the FERS payroll in 1998 and were projected to be 4.5 times payroll in 2070 (OPM 1999a).

Table 2 summarizes the major features of CSRS and FERS. These include the basis for the formula, retirement conditions and cost-of-living adjustment (COLA) projections. (Other features and details may be obtained through the OPM website <www.opm.gov>.)

CSRS and FERS Governance Issues

CSRS and FERS are administered by OPM with the assistance of the federal agencies. The Federal agencies distribute information on the retirement systems to their employees, channel agency and employee contribution to the CSRS fund, and submit the request for retirement benefits. At retirement, OPM determines the annuity and initiates the benefit payments, and, after retirement, makes any changes to the annuity benefit such as the annual COLA increase.

By law, retirement funds are invested by the Secretary of the Treasury in federal securities. All but a small portion of the investments are in non-

TABLE 2. Key Features of CSRS and FERS

	<i>CSRS</i>	<i>FERS</i>
Full retirement benefit	1.5% for the first five years of service, 1.75% for the next five, 2% for the rest; maximum 80%	1% for all service, no maximum 1.1% for all service if retired after age 60 with 20 years of service
Applied to	High-three years salary	High-three years salary
<i>Retirement eligibility</i>		
Full unreduced benefits	Age 55 with 30 years of service Age 60 with 20 years of service	Minimum retirement age (MRA) with 30 years of service
Age 62 with 5 years of service	Age 60 with 20 years of service	Age 62 with 5 years of service
Reduced benefits	None available	MRA and 10 years of service—reduced 5 percent for each year under age 62
Mandatory retirement	None	None
Vested benefit	After 5 years of service, payable at age 62	After 5 years of service, payable at age 62; after 10 years of service a reduced benefit is available at MRA
Cost-of-living increases	Annual increase equal to change in consumer price index (same formula as for social security)	Annual increase in consumer price index (CPI) less 1 percent No increase before age 62 (increase is CPI if that is less than 2 percent and graded if CPI between 2 and 4 percent)
Employee contributions	7.25 percent in 1999, 7.4 percent in 2000, 7.5 percent in 2001, 7 percent after 2001	1.05 percent in 1999, 1.2 percent in 2000, 1.3 percent in 2001, 0.8 percent after 2001

Source: Office of Personnel Management (1998).

marketable bonds issued solely for the purpose of holding the retirement funds. The special issues are created every June 30 for new money with maturities spread over fifteen years and a yield equaling the average of all marketable Treasury securities with four or more years till maturity. Cash balances arising during the year are held in special short-term issues maturing on the following June 30.

Administrative costs charged to CSRS/FERS in 1997 were \$102 million or 0.2 percent of total expenditures. These are only the direct costs of OPM and do not include those of the employing agencies nor Treasury investment costs.

Actuarial Assumptions in CSRS and FERS

A three-member Board of Actuaries appointed by OPM is charged with setting the actuarial methods and assumptions used to determine the normal cost and unfunded liabilities of CSRS and FERS. At present the board assumes that inflation will be 4 percent a year and investment return of the CSRS/FERS fund will be 7 percent a year (OPM 1998). Salary scales are projected to grow by 4.25 percent a year with additional individual salary increases averaging 2.15 percent a year. Demographic rates are developed based on plan experience. The current set of rates, adopted in 1994, includes withdrawal, involuntary retirement, voluntary retirement, and disability retirement rates. Separate mortality rates are used for active employees, non-disability annuitants, disability annuitants, and survivors.⁸

The Federal Thrift Savings Plan

The TSP is a defined contribution plan of the 401(k)-type, that permits federal employees to contribute and allocate tax-deferred funds among three investment options. The TSP is administered by the Federal Retirement Thrift Investment Board (FRTIB) established as an independent agency by the Federal Employees' Retirement System Act of 1986 (FERSA).

Employees' choice of funds was restricted when the program began in 1987, but all restrictions were removed in 1991. The three funds are known as the "G fund" or the Government Securities Investment Fund; the "F fund" or the Fixed Income Index Investment Fund; and the "C fund" or the Common Stock Index Investment Fund. Additionally two new funds, a small-capitalization U.S. stock (S) fund and an international stock (I) fund, will be added in 2000.

Employees covered by FERS may contribute up to 10 percent of salary to the TSP. These employees receive an automatic one percent of salary contribution with variable matching on the first 5 percent of salary.⁹ FERS participants are fully and immediately vested in their own as well as the govern-

ment's matching contributions. Participants become fully vested in the one percent automatic contribution after three years of federal service. Employees covered by CSRS can contribute up to 5 percent of salary, but there are no government contributions. Eligible employees are provided two open seasons each year during which they can begin to contribute, change their contribution rate, and/or change how their contributions are invested. Balances on account may separately be transferred among the funds by participants (\$10,500 in 2000).

Employee contributions are limited by the elective deferral limit imposed by the Internal Revenue Service. But the TSP is exempt from application of the actual contribution percentage (ACP) test. The ACP test limits contributions of highly compensated employees to a specified amount over the contributions of non-highly-compensated employees. The FRTIB argued that it would be difficult if not impossible to calculate these percentages for the diverse federal workforce. Congress agreed and exempted the TSP from the ACP test, arguing that the TSP was inherently nondiscriminatory.

An employee who separates from service can choose to withdraw the funds, have the TSP purchase an annuity, leave the funds with the TSP, or roll over the balance to an individual retirement account. An employee who leaves funds with the TSP can choose, at any time before age 70½, to withdraw the account balance, select a life annuity, or receive a series of monthly payments.

Active employees over age 59½ are permitted a one-time withdrawal of all or part of their accounts. The TSP does not allow other early withdrawals except for hardship, but loans are permitted for any purpose. As of December 1999, there were 616,000 loans with an outstanding balance of \$3.0 billion, or three percent of the total fund.¹⁰ Restrictions and taxes on payments are the same as those that apply to private sector plans established under section 401(k) of the IRS code (McGill 1996).

Governance of the TSP. The FRTIB is composed of five part-time presidential appointees and a full-time executive director selected by those appointees. Each of these officials is required by FERSA to have "substantial experience, training, and expertise in the management of financial investments and pension benefit plans." (5 U.S.C. § 8472(d)). The TSP board members collectively establish the policies under which the TSP operates and furnish general oversight. The executive director carries out the policies established by the board members and otherwise acts as the full-time chief executive of the agency. The board and the executive director convene monthly in meetings open to the public to review policies, practices, and performance. The National Finance Center of the Department of Agriculture has been the TSP recordkeeper, since the fund's creation in 1987 (Mehle 1997).

Costs related to investments are charged against investment return by the fund manager. As with the retirement system, employing agencies dissemi-

nate information about the TSP, and funnel agency and employee contributions to the thrift fund. The Thrift Board deals directly with the current or former participant on other matters related to the individual's account. TSP administrative costs are charged to the fund and are offset by account forfeitures. The gross expense ratio (pre-forfeiture offset) has declined steadily as the assets have grown, from an average of 0.67 percent of funds in 1988 to 0.07 percent in 1999. After applying forfeiture credits of 0.02 percent, the net expense ratio was 0.05 percent in 1999. These expenses include the investment management cost of the C and F fund but they do not include the administrative costs of the employing agencies.

As an independent entity, the TSP Board is not subject to the normal review and oversight of federal agencies, but the law did provide for continuing audit and review by outside authorities. The board's annual operations and actions are audited by the Pension and Welfare Benefits Administration (PWBA) of the Department of Labor and an independent auditor. The board is also advised by a 14-member Employee Thrift Advisory Council nominated by employee and retiree groups and appointed by the chairman of the Thrift Board.

*TSP investment policy and process.*¹¹ The TSP's investment policy and process was a subject of extensive discussion when the program was under design. Much concern centered around the fact that the fund would rapidly grow to be a major presence in financial markets, and as such, might be used by the federal government to support policy. For example, analysts worried that TSP funds might be used to support social policy such as inner-city investment, or to affect foreign policy, prohibiting investment in corporations doing business in certain countries.

Another concern centered around the perception of investment choices in the C fund. Shifts in investments among firms might be viewed as a sign of insider knowledge about those firms and perceived as manipulation of the market. Even if the investment shift were made based on public information, changes in TSP investment policy could cause much of the market to follow. These concerns moved Congress to consider approaches that would protect the plan's investment policy from any influence by federal policymakers. One possibility would be to permit individuals to freely select investments, while another would be to let workers select any qualified institution to make their investments. The compromise elected for the C fund was to use a passive "indexed" investment approach that was then beginning to be popular among governmental and private sector pension funds. Indexed funds seek to replicate performance of a market index by investing in the same issues in the same proportion as the index. The proportions are based on the market capitalization of all outstanding publicly traded shares.

The board selected the Standard and Poor's 500 stock index as the passive index that would meet the requirements of FERSA; the Lehman Brothers

TABLE 3. Annual Yields of Federal Thrift Savings Plan Funds (1988-97)

<i>Year</i>	<i>C fund (%)</i>	<i>F fund (%)</i>	<i>G fund (%)</i>
1988	11.8	3.6	8.8
1989	31.0	13.9	8.8
1990	-3.2	8.0	8.9
1991	30.8	15.7	8.2
1992	7.7	7.2	7.2
1993	10.1	9.5	6.1
1994	1.3	-3.0	7.2
1995	37.4	18.3	7.0
1996	22.9	3.6	6.7
1997	33.2	9.6	6.8
1998	28.4	8.7	5.7
1999	21.0	-0.9	6.0

Source: U.S. Federal Retirement Thrift Investment Board (web site).

Aggregate Bond index was selected for the F fund. Asset managers of the C and F funds are selected through competitive bidding. The current contractor is Barclays Global Investors (BGI), which invests the C fund assets in the Barclays Equity Index Fund and the F fund in the Barclays U.S. Debt Index Fund. The G fund is invested in nonmarketable U.S. Treasury issues similar to those of the CSRS/FERS fund.

Annual returns on the C, F, and G funds through 1997 appear in Table 3. The C fund has been the most volatile, and had the highest yield with returns varying from a loss of 3.2 percent in 1990 to a gain of 37.4 percent in 1995. The F fund returns have ranged from a loss of 3.0 percent in 1994 to a gain of 18.3 percent in 1995. The G fund returns have been steady ranging from 6.1 percent in 1993 to 8.9 percent in 1990.

Employee participation in the TSP. As of December 1999, there were 1.4 million FERS employees eligible to participate in the TSP, of which 86 percent contributed from their own salaries; the remaining 14 percent received only the mandatory 1 percent federal contribution. There were also 628,000 CSRS employees contributing for a total of 2.1 million contributing participants as of December 1999. Both the number and the percent of participants have steadily increased since the first open season in 1987 when only 29 percent of the 563,000 eligible FERS employees were contributing. (TSP does not track CSRS employees who do not contribute but we estimate that 600,000 eligible CSRS employees do not contribute). Our best estimate is that 1.9 million of the 2.7 million total eligible employees, or 70 percent, are participating in TSP. Figure 3 shows the number of participants since 1987 (information from FRTIB website).

The average contribution rate for FERS participants increased from 3.7 percent in 1987 to 6.8 percent in 1997. One-third of the participants contrib-

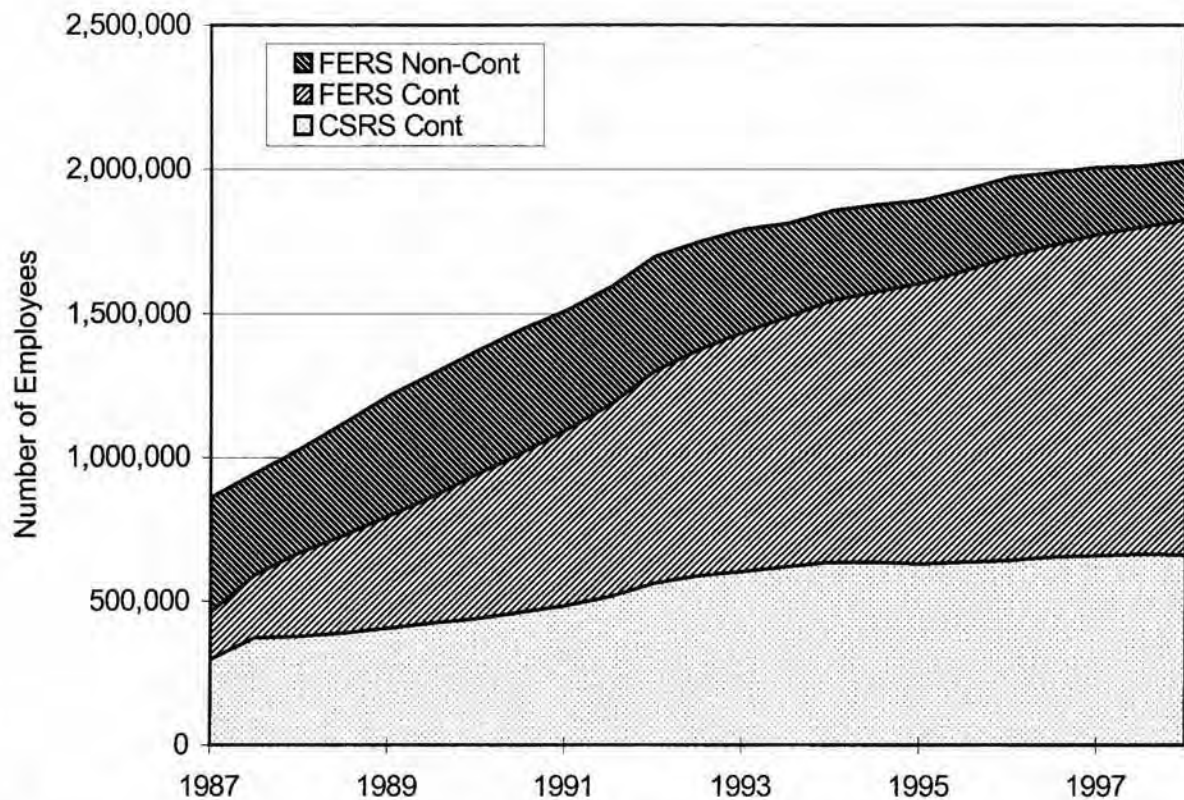


Figure 3. Federal employees contributing to TSP. Source: data supplied by the Federal Retirement Thrift Investment Board.

ute the full 10 percent, and a fifth contribute the 5 percent needed for the maximum employer match. Counting those contributing more than 5 but less than 10 percent, two thirds of FERS participants receive the maximum 5 percent federal contribution. The average contribution rate for CSRS participants increased from 3.2 percent in 1987 to 4.4 percent in 1997, with 76 percent contributing the full 5 percent permitted under the plan (FRTIB 1998).

Growth of TSP funds. Figure 4 shows the growth of the TSP fund and its three accounts since inception. As of December 1999, there was \$59.2 billion invested in the C fund (63 percent), \$31.5 billion in the G fund (33 percent), and \$4.0 billion in the F fund (4 percent) for a combined TSP fund of \$94.6 billion.

The Military Retirement System

The military retirement system is part of an integrated pay, benefits, and allowance system used by the Department of Defense (DoD) to recruit, retain, motivate, and ensure a young and vigorous active-duty force. The military's noncontributory defined benefit plan is administered and funded by DoD, and it covers military members of the Army, Navy, Marine Corps, and Air Force. It does not include DoD civilian personnel, inasmuch as they are included in the two federal civilian retirement systems described above. Most of the DoD's system provisions also cover members of other uniformed services including officers of the National Oceanic and Atmospheric Administration (Department of Commerce), officers of the Public Health Service (Department of Health and Human Services), and the Coast Guard (Department of Transportation). This discussion focuses on DoD's military personnel, since this group is by far the largest group covered.

Military retirement must be considered as one of many components of military compensation. Even when the total force size is held constant, 11 percent of the active-duty force is replaced per year. Unlike most employers who hire employees at all ages, new entrants in this system are almost exclusively between the ages of 18 and 22 (with those at the lower ages being enlisted men and women, and those at the older ages being officers). Most of the new entrants (67 percent) serve less than six years, taking advantage of education and other separation benefits designed to recruit and only temporarily employ these members. The turnover patterns result in a force where over half of all members have less than seven years of service at any given time. The average age of the entire active-duty force is 29 (DoD 1998a).

Military benefits. Today's military retirement system for nondisabled retirees provides benefits for active duty personnel retiring after twenty years of service at any age and for reservists (part-time military members) at age 60 with twenty years of service. The system also provides lifetime monthly

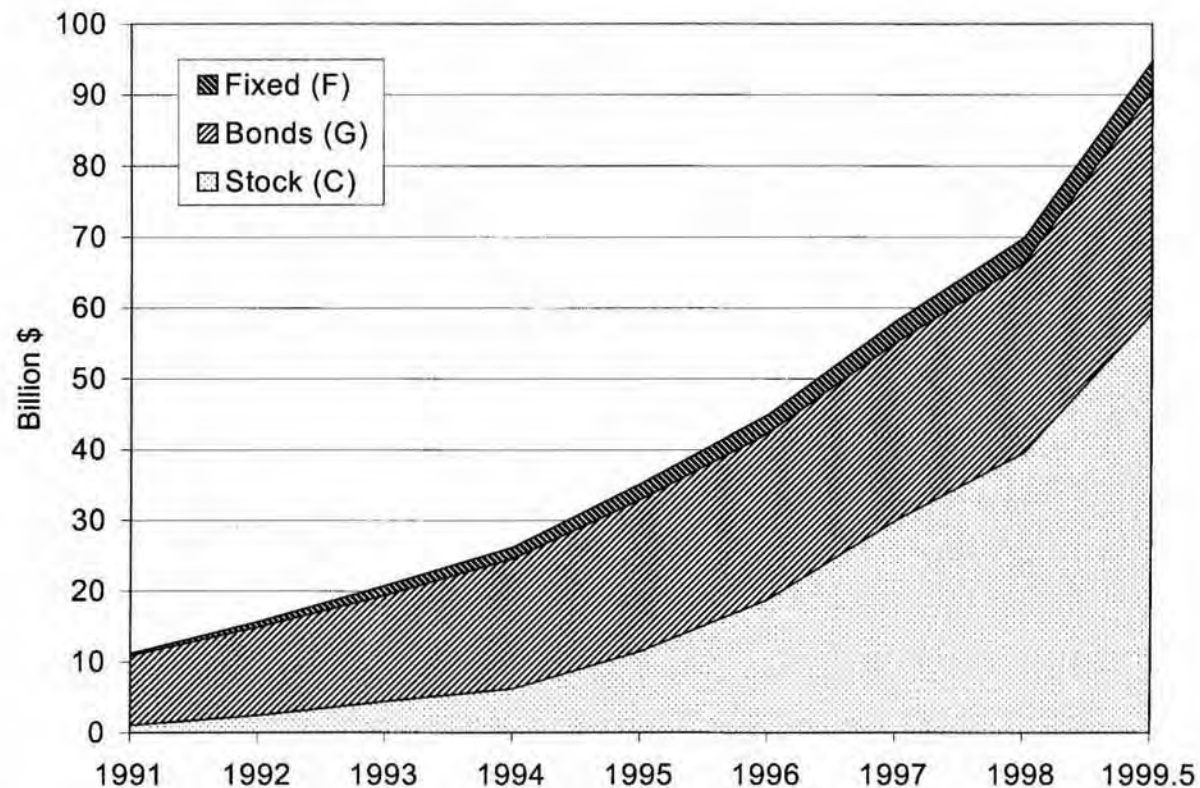


Figure 4. Growth of TSP funds. Source: data supplied by the Federal Retirement Thrift Investment Board.

disability benefits when a member can no longer fulfill the duties of the job; it also pays annuities to survivors of those who die on active duty with over twenty years of service or elect an annuity benefit at retirement.

The military plan is a defined benefit pension, with benefits calculated as a percent of "basic pay." Though basic pay is the main portion of all servicemembers' compensation, it is not directly comparable to private sector earnings. To make such comparisons, one would instead use the concept of "regular military compensation" (RMC), which includes basic pay, cash or in-kind allowances for housing and subsistence, and the tax advantage of these allowances (since they are not federally taxed). Basic pay averages about 72 percent of RMC (DoD 1998b). Consequently, while it is common to hear the twenty-year retirement benefit described as "50 percent pay for life," it is closer to 35 percent (72 percent of 50 percent).

The military retirement system provides an immediate and indexed retirement benefit payable at twenty years of service with no minimum age limitation. These retirement benefits are generally referred to as "retired pay," because most retired members are subject to recall to active duty. (The Uniform Code of Military Justice provides sanctions for the enforcement of the recall.) Unlike other private and government plans, there is no vesting prior to normal retirement in a military pension. In fact, only 18 percent of new entrants complete twenty years of service, but 79 percent of those with ten years of service stay to twenty years, demonstrating the power of this retention tool.¹²

These turnover patterns are the intentional consequence of structured personnel policies in the military. The need for a young and vigorous force, the tremendous investment in training, and the near impossibility of replacing military-specific skills at mid-career or late-career make imperative the careful management of human resources. This explains why numerous reviews of the military pension system reject the notion of allowing vesting prior to twenty years of service, because of its potentially devastating impact on retention and force structure (such as the 5th Quadrennial Review of Military Compensation). Similarly, defined contribution plans are rejected in the military arena, even though private sector employers have curtailed or eliminated defined benefit plans in favor of employer-subsidized defined contribution plans to appeal to an increasingly portable workforce. Indeed, defined contribution plans are seen as a threat to the tremendous retention power of the current "all-or-nothing" military retirement system.

The fact that the system works is signaled by the fact that more than 60 percent of retirees take the benefit at the first chance they get, receiving retired pay beginning at an average age of 42. Promotion, policies, assignments, and dedication—complemented by targeted longevity increases, special pays, and bonuses—allow for the critical retention of selected employees beyond twenty years of service, but even so, most of these leaders

leave by thirty years of service, when the retirement system accruals stop (DoD 1998b).

A brief history of the military retirement plans. Most societies devote special care to those hurt defending the country in battle, and the United States is no exception. In 1636, the Pilgrims at Plymouth declared that wounded soldiers and surviving indigent families would be supported for life. In 1776, our first national pension law promised 50 percent lifetime pay to the disabled servicemen. Benefits for Navy seamen have been around for many decades as well (Clark et al. this volume). By 1832, as the numbers of veterans declined and system revenues increased, full pay for life regardless of need was awarded. All of these disability benefits were administered by bureaus and administrations that were predecessors of today's Department of Veterans Affairs.

When the Civil War started, there was a need to retire aging military members to replace them with a young and active force, and the first major non-disability retirement act was enacted. This 1861 law separated soldiers after forty years of service. After the Civil War, Congress enacted legislation to draw down the force strength by providing retiring officers with benefits worth 75 percent of pay at thirty years of service (at any age). This fundamental design of 2.5 percent accrual per year of service (2.5 percent times thirty years equals 75 percent) is still the one in effect today. Each subsequent war and peacetime period since the Civil War brought expansions and refinements to the system, and the military has also changed its recruitment policy from time to time, sometimes using a volunteer and other times using a draft induction system. But for more than a century, retiring service-members' benefits have been calculated using this same formula.

Between 1920 and 1949, numerous laws shaped the distinction between *disability* benefits that continued to be administered by the Department of Veterans Affairs (VA), and separate *disability and nondisability* benefits transferred to the Department of Defense as part of the military retirement system. No one act clearly defined how these two entitlement systems were to be separated. The resulting military retirement system includes a lifetime *permanent disability* benefit that is awarded when the military member cannot continue to fulfill job obligations. Disability-specific rating scales developed by the Department of Veterans Affairs are used by DoD to determine the percentage of disability. Generally speaking, this percentage is multiplied by basic pay to determine the benefit at the time of separation. This benefit is indexed to inflation over time.

The *disability* compensation benefits administered by VA loosely resemble workers' compensation benefits of the sort designed during the early 1900s. These are the descendants of the original disability benefits established by the Pilgrims, and they are not part of the military retirement system. Un-

like DoD disability benefits, these benefits do not depend on a worker's ability to continue service, but rather they are awarded for changes in health status between entry and departure from the military. VA compensation is awarded for combat disabilities, other accidents that take place during a military career, and natural-life diseases acquired in the military (such as high blood pressure and diabetes). Prior to the Civil War, disability benefits were mainly combat-related. Because more soldiers died from disease than any other cause during the Civil War, in 1862 President Lincoln signed an innovative act that extended compensation to cover diseases incurred while in service (VA 1994).

The VA disability rating scales are used to determine initial flat amounts that are then indexed annually to inflation. As veterans age and disabilities worsen, reopened claims can increase monthly benefits. For example, a 30 percent initial disability benefit for high blood pressure could become a 100 percent disability benefit for a heart attack years later. Two out of every three claims adjudicated within the VA compensation system in 1998 were reopened claims. There were approximately 25 million veterans in the United States in 1998, and monthly VA disability compensation benefits were awarded to 2.3 million of them (VA 1994). About one fourth of the VA disability recipients were also entitled to DoD military retirement benefits (DoD 1998a).

DoD military retirement system benefits, including nondisability, disability, and survivor benefits, are offset for any amounts paid by the VA. However, since VA benefits are tax-free and can become greater than the DoD benefit over time, many members apply for both. Approximately 27 percent of DoD *nondisability* retirees and 70 percent of DoD *disability* retirees also receive VA *disability* compensation benefits (DoD 1998b).

Military members were brought under social security as of 1957. At that time, the social security old age, disability, and survivor benefits were simply added to existing military and VA benefits; no attempt was made to integrate the two systems. After the draft ended in the mid-1970s, military pay was increased to ensure that DoD could compete with the private sector for its all-volunteer force. The end of the draft also forced the military retirement system to undergo an evaluation, and in 1980 the system was revised for new entrants. This produced two different retirement benefit structures, one for those already employed prior to 1980, and another for new hires. After continued analysis Congress and the administration adopted in 1986 some of the recommendations of the Fifth Quadrennial Review of Military Compensation,¹³ changing the system again for new entrants. This process resulted in the three different retirement benefit structures described above. In 1998, the services expressed concern with recruiting and retention during an unprecedented period of low unemployment. As a result, the National Defense

TABLE 4. Military Nondisability Benefit Formulas (as of February 1999)

<i>Employees entering:</i>	<i>Name of formula</i>	<i>Base pay used in formula</i>	<i>Factor employed in formula</i>	<i>Annual COLA</i>	<i>Other</i>
Before 9/8/80	Final pay	Basic pay at retirement	2.5%/year service capped at 30 yr	CPI	—
9/8/80–7/31/86	HI-3	Average highest 36 months basic pay	2.5%/year service capped at 30 yr	CPI	—
On or after 8/1/86	Redux *	Average highest 36 months basic pay	2.5%/year service capped at 30 yr with 1% penalty for each year retired under 30 yr	CPI minus 1% (even after age 62)	Age 62: one-time benefit adjustment to restore the <30 yr of service penalty and COLA reductions

Source: Authors' compilation of data supplied by the DoD Office of Actuary.

The President's FY 2000 Budget proposed eliminating the penalty for this population.

*At 15 years of service, participant may switch to HI-3 formula or receive a bonus and stay in Redux.

Authorization Act for FY2000 (P.L. 106-65) included language that allows post-1986 members at fifteen years of service a choice between a bonus or moving to the higher 1980 retirement plan.

Nondisability benefits for active duty personnel. As a result of these changes in the system rules over time, different benefit formulas apply to the three distinct populations within the military retirement system. Anyone may retire at twenty years of service (at any age), and his or her benefit is derived by multiplying base pay by a total accrual factor. After the initial pay is calculated, nondisability benefits are then indexed using an annual cost-of-living adjustment.

The specific benefit accrual factors do, however, differ by date of hire. Members entering military service prior to September 8, 1980, have an initial retirement benefit equal to (final basic pay) * (2.5 percent) * (years of service). Beginning with members entering military service on September 8, 1980, the average highest thirty-six months of basic pay was used instead of final basic pay in the initial benefit calculation. Members entering on or after August 1, 1986, were subject to additional changes. There was a one percent penalty for each year of service under thirty years of service at retirement. Consequently, a twenty-year retiree has a 50 percent (2.5 percent for twenty years) total accrual factor reduced by 10 percent, for the ten years of service not served, to equal 40 percent. In addition, the COLA for these members is reduced by one percentage point. At age 62, there is a one-time "catch-up" adjustment in the benefit to reinstate the accrual and the COLA reductions, but the annual COLA is subject to reductions thereafter. At fifteen years of service, a member can accept a \$30,000 bonus and remain under this plan, or give up the bonus and move to the higher 1980 benefit levels. This retention bonus is not considered part of the retirement system, and obligates the member to serve five more years. Table 4 summarizes the benefit formulas for the three populations, which are referred to as "Final Pay," "HI-3," and "Redux" respectively.

The FY 1993 defense authorization act (PL 102-484) included temporary early retirement authority (TERA) for the military services, as part of an effort to reduce the size of the active duty force. Unless extended again, this authority expires September 30, 2001, and it allows the military services to offer retirement to members with between fifteen and twenty years of service. These members receive an immediate annuity calculated normally, but with 1 percent penalty for each year under twenty years of service. Part or all of the penalty can be restored at age 62, if the retiree works in a qualified public service job for the period from retirement until twenty years of service would have been completed. As of September 30, 1998, there were 52,000 TERA retirees receiving \$615 million annually (DoD 1998b).

Nondisability benefits for members of the reserves. The Reserve Components of the Armed Forces include the Army National Guard of the United States,

the Army Reserve, the Naval Reserve, the Marine Corps Reserve, the Air National Guard of the United States, the Air Force Reserve, and the Coast Guard Reserve. The Ready Reserve is comprised of military members of the Reserve and National Guard organized in units or as individuals, liable for recall to active duty to augment the active components in time of war or national emergency as provided by law (Hunter 1998). Members of the reserves are part-time military members, and may be fully employed in a civilian capacity for the federal government or the private sector. These members may retire after twenty creditable years of service (the last eight of which must be in a reserve component), but their retirement benefits are not payable until age 60. The benefit formula is equal to $(\text{base pay}) * (2.5 \text{ percent}) * (\text{years of service})$. A member entering military service before September 8, 1980, has a base pay equal to the active duty basic pay in effect for the reservist's grade and years of service at the time that retired pay begins. A member entering service after this time has a base pay equal to the average basic pay for the reservist's grade in the last three years in service. Since reservists are part-time employees, their years of service are calculated using a point formula that translates effort into years. One point is awarded for each day of service or drill attended, and fifteen points are earned for each year's membership in a component. A creditable year is one in which fifty or more points are earned. While a member must have at least twenty creditable years to retire, points earned in a noncreditable year are counted towards years of service. The sum of the points divided by 360 equals the years of service. For example, a reservist who has 25 years of creditable service and 1,500 points in total would have an initial benefit at age 60 of 10.4 percent of base pay (1,500 divided by 360, times 0.025).

Military disability benefits. As stated earlier, military members are eligible for disability benefits from Social Security, the Department of Veterans Affairs, and the military retirement system. If the disabled member cannot fulfill job duties and has at least a 30 percent disability, then a disability annuity is calculated. If this disability is temporary, then it must be rated at least 50 percent, physical exams must take place every eighteen months, and a final determination must be made within five years in order to terminate the annuity or consider it permanent. The annuity is equal to the larger of the nondisability calculation or the benefit derived by multiplying the percentage of disability by base pay. Base pay is determined exactly like the base pay used in the nondisability formula, depending on when the member entered military service. Federal income taxes do not apply to the part of the annuity equal to the disability percentage times base pay.

Survivor annuities from the military. At retirement, military members have the option to have a portion of retired pay continue to their dependents upon the retiree's death. In return, the member's retired pay is reduced to cover all or a portion of the cost of this benefit. Several design changes have

altered survivor benefits over time, following its institution in 1953. Between 1953 and 1972, the Retired Servicemen's Family Protection Plan (RSFPP) was in effect; here members paid the entire cost of this program, as it was not federally subsidized. However RSFPP came to be seen as both inadequate protection and too expensive.

Consequently in 1972, the Survivor Benefit Plan (SBP) was enacted for new retirees, and those already retired were given the option to convert to SBP. The government subsidizes the SBP benefit, directly by paying for benefits in excess of revenues and indirectly by not taxing members' pay directed towards SBP premiums. Overall, the total subsidy averages about 34 percent (information from DoD, 1998b). Benefits to survivors are a percentage of the base amount elected by the retiree; premium reductions are also based on the elected base amount. This base amount cannot be greater than retired pay or less than \$300. As a result of a 1998 law, the retiree pays premiums for a maximum of thirty years.

SBP annuities are 55 percent of the base amount if the annuitant is under age 62, and 35 percent of the base amount for older persons. This two-tiered benefit structure was designed around the concept that the reduction at 62 is offset by social security benefits available at that age. Initially, SBP was equal to a flat 55 percent for everyone, with benefits offset by social security at 62; the automatic reduction to 35 percent at age 62 was implemented for administrative ease. Beginning in 1992, retirees electing the maximum base amount can eliminate all or a portion of the reduced second tier by paying the full cost of this added benefit through increased premiums.

Members who die on active duty after twenty years of service are assumed to have retired on their date of death and to have elected survivor benefits. Just as for retired pay, all SBP annuities are offset by survivor benefits awarded by VA, but any past retiree premium payments relating to the reduction are returned to the survivor. Cost-of-living increases and other adjustments are applied as they would have been to the retiree. For example, a survivor of a retiree under the Redux retirement system would get annual increases equal to the consumer price index (CPI) minus one percent, and a one-time catch up to full inflation on the anniversary of the deceased member's sixty-second birthday.

Reservists are eligible to elect SBP at age 60 when they begin to draw retired pay. A reservist who accumulates twenty years of service before age 60 can elect to participate in the Reserve Component Survivor Benefit Program (RCSBP), which provides survivor benefits in the event of death before age 60. The added cost of this benefit is fully borne by the member through future additional reductions in retired pay and survivor annuities.

Cost-of-living adjustments in military pensions. Prior to 1958, military retired pay was generally increased by the same percentage as the increase in basic pay. Since military pay increments exceeded the inflation rate during that

period, annuity increases were greater than if they had been based on the CPI. This process was replaced with an automatic mechanism in 1963 that tied increases to the CPI. Two years later, the COLA formula was altered to ensure that annuities were increased, whenever the CPI increased by 3 percent. Between 1969 and 1977, each automatic calculation included an additional one percentage point, designed to make up for a supposed lag between the calculation of and implementation of the COLA. The designers did not recognize that compounding of the one percent increases would soon greatly exceed the effect of a one-time lag. In 1977, the extra percent was eliminated and cost of living increases were then set for March and September of each year.

Increases to annuities in a public system this large are always vulnerable to temporary minor modifications in timing and amount, because of the huge Federal savings that this generates. This occurred in late 1997 to early 1998, at a time when annuitant payments were running close to \$30B annually, or \$2.5B a month. Increasing the monthly checks by 2.1 percent beginning January 1998, for example, resulted in a monthly increase in spending of \$53 million. If legislation had delayed this COLA increase by three months it would have saved over \$150 million in fiscal year 1998. Granting a 1.1 percent increase instead of a 2.1 percent increase would have saved over \$225 million in 1998 alone, compounding thereafter. Because several such changes occurred over time, a different strategy was adopted in 1984. At this point the military and civilian retirement systems adopted the indexing mechanism used by the social security system. Henceforth, January benefit payments are increased by the percentage increase in the average of the CPIs for July, August, and September over the averaged CPIs for the same three months of the prior year. Using a common mechanism for indexing all federal plans has made temporary changes to only one of these plans nearly impossible.

Military system financing. Prior to 1984, the military retirement system was operated on a pay-as-you-go basis. In other words, there was no trust fund backing military promises, and the amount paid out to retirees in any one year came directly from the DoD budget. To illustrate the impact on DoD budgets, there were 3,000 military retirees with an annual cost of \$3.5 million in 1900; by 1984 the number of retirees had risen to 1.35 million with an annual cost of \$16.5 billion—a figure that represented approximately half of the military's payroll (DoD 1998a). Projections at the time indicated that retirement outlays would increase to 70 percent of payroll within the ten-year budget window (DoD 1998b).

The movement toward a funded system began in the mid-1980s. Most federal pension plans have had to adhere to standardized reporting requirements under P.L. 95-595 since 1980. Using an aggregate entry-age normal cost funding method to value system liabilities, the system actuaries estimated that the normal cost of the system was approximately equal to the

plan disbursements in FY 1984 (50 percent of basic pay). The decision was taken to make the switch to a funded plan in 1984 because after that year, retiree payments would begin to increase rapidly over normal cost payments. Charging DoD with only the accruing liability of the current force would quickly lower the cost of the retirement obligation in the military budget.

The Military Retirement Fund was therefore created under PL 98-94 to move the military retirement system from a pay-as-you-go to a funded system. It charged the military budget with the accruing retirement cost of the current active-duty and reserve force using the aggregate entry-age normal methods. This normal cost is calculated as a percentage of basic payroll and transferred to the trust fund throughout the year when pay is dispersed. The law specified that payments on the initial unfunded liability (\$529 billion) would be made to the trust fund at the beginning of each fiscal year from the General Fund of the Treasury. Payments to amortize annual changes in unfunded liabilities (for plan amendments, changes in assumptions, and experience gains and losses) are handled similarly. The legislation passed with little controversy because it ensured that the defense budget would not continue to rise due to past manpower decisions, and current manpower decisions could be made with the full knowledge of the cost of current decisions.

Figure 5 compares the retirement charges to the military budget under the funded and the pay-as-you-go systems since 1984. Specifically, it compares the normal costs for the method used since 1984 to the plan disbursements as a percentage of basic payroll which was the method used prior to 1984.

DoD's retirement contribution in any one year includes a full-time normal cost contribution (for the active-duty force), and a part-time normal cost contribution (for reservists). The annual full-time normal cost percentage (NCP) is derived as the weighted average of the NCPs relating to the three distinct benefit formulas; the weights reflect the percentage of payroll that year relevant to each of the systems. Since the newer systems offer less generous benefits, the weighted NCP drops annually. It should also be noted that half of the basic payroll goes to members with less than eight years of service, so it does not take long for the budget to noticeably change when new benefit rules are implemented for new entrants. The annual part-time NCP is calculated in the same manner as that for full-time personnel.

In FY 1998 the full-time "weighted" normal cost percentage was 30.4 percent and the part-time normal cost percentage was 8.8 percent. These amounts are obtained by multiplying by the basic pay of their respective members to determine the amount transferred from the DoD military budget to the trust fund. As shown in Table 5 (DoD 1998b), the total basic payroll was a little over \$37B and the normal cost contributions to the trust fund were \$10.4B in FY 1998—a figure that represented 28 percent of basic pay. This percentage is smaller than the 1985 original percent (50.7 percent) be-

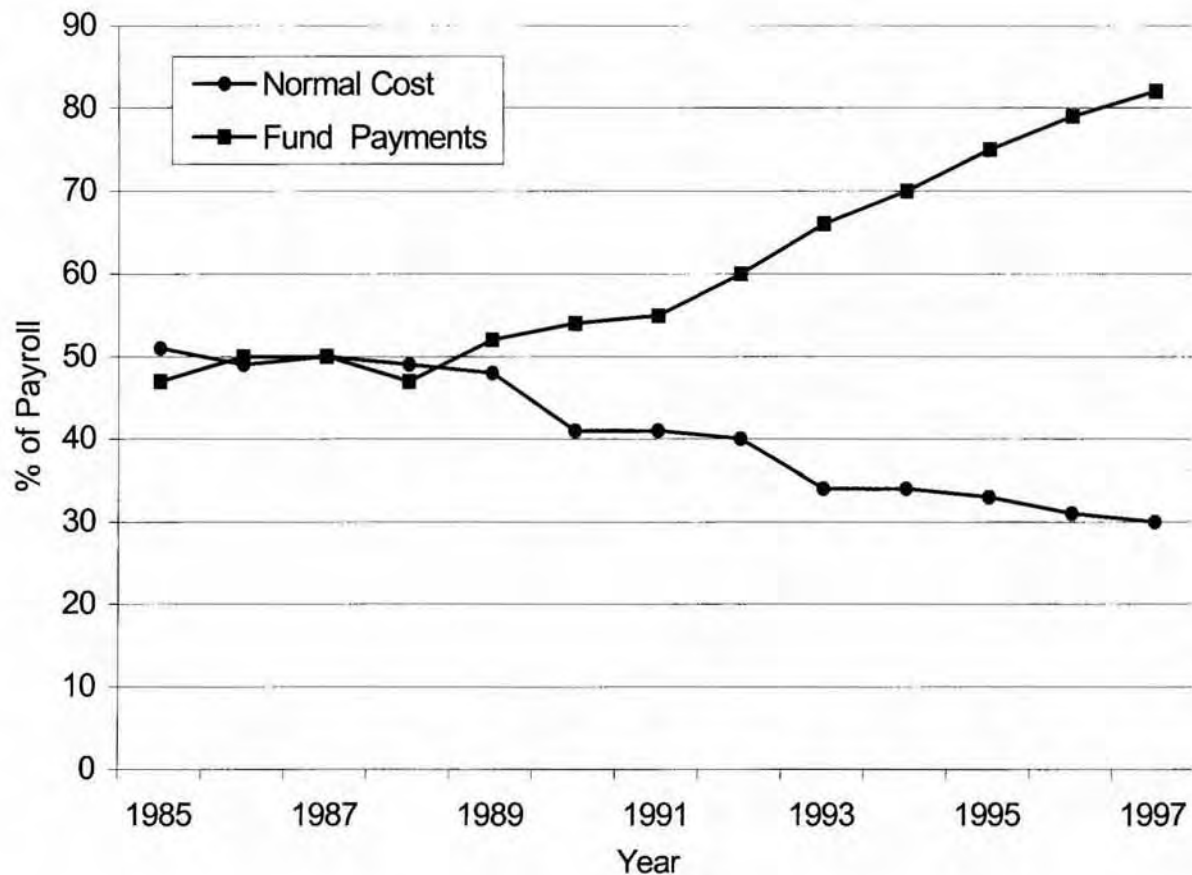


Figure 5. Plan costs as percent of basic payroll. Source: data supplied by the Department of Defense.

TABLE 5. Development of FY 1998 Full-Time and Part-Time Normal Cost Percentages

	<i>Final pay (%)</i>	<i>HI 3 (%)</i>	<i>Redux (%)</i>	<i>Weighted (%)</i>
Weighting factors*	17.0	19.3	63.7	
Full-time NCP	36.7	33.0	28.0	30.4
Part-time NCP	9.8	9.3	8.4	8.8

Source: Department of Defense Office of the Actuary (1998b).

*These factors are the percent of basic payroll attributable to members under each benefit formula.

cause of the introduction of less generous benefits in 1986, and because of increasing real interest rate assumptions.

The unfunded liability of the system is intended to be paid off in fifty annual payments, with the last being in year 2033. Changes in unfunded liability due to benefit formulas, changes in actuarial assumptions, and experience gains and losses are amortized over thirty years by payments that increase in absolute value at the same rate as the annual long-term pay scale assumption (currently 4 percent). Total annual payments on the \$496 B unfunded liability (made by Treasury to the retirement fund) were \$15 billion in FY 1998. Unfunded liability and normal cost payments include the cost of projected inflation so they are adequate to fund the retirement system (DoD 1998b).

Each year the retirement fund is credited with normal cost contributions from DoD, payments on the unfunded liability from Treasury, and investment income. It pays all benefits to retirees and survivors. Under law, the assets of the retirement fund are invested in special issue Treasury securities bearing interest equal to current market yields for federal securities of comparable maturities. The fund balance increased from zero at the end of FY 1984 to \$150B at the end of FY 1998 (five times payments to annuitants).

Governance of military pension plans. The military retirement system is administered by the DoD, and trust fund assets are invested by an Investment Fund Manager employed by DoD. P.L. 98-94 (currently chapter 74, title 10, U.S.C.) established an independent three-member DoD Retirement Board of Actuaries. The members each serve fifteen-year terms, and one new member comes on every five years (original terms were five, ten, and fifteen in order to achieve this ultimate arrangement). The DoD chief actuary serves as the executive secretary of the Board and the Office of the Actuary provides all technical and administrative support to the board. This support is proactive in nature instead of reactive, and includes recommendations as to assumptions and methods. The DoD Office of the Actuary produces all aspects of the actuarial valuations of the system. It has a valuation model that produces the normal costs, unfunded liabilities, and open group pro-

TABLE 6. Military Retirement System: Key Plan Statistics

Total active-duty members and full-time reservists	1,459,000
Total monthly basic pay (\$M)	\$2,850 M
Total selected drilling reservists (part-time)	817,000
Total monthly basic pay (\$M)	\$296 M
Total number of nondisability retirees	1,556,000
Total monthly retired pay (\$M)	\$2,362 M
Total number of disability retirees	111,000
Total monthly retired pay (\$M)	\$116 M
Total number of surviving families	234,000
Total monthly survivor annuities (\$M)	\$144 M

Source: Department of Defense Office of the Actuary (1998b).

jection over the next 100 years. Other models allow the office to project the unfunded liability over time, amortize the payments to the fund, produce a cash-flow analysis for the DoD investment fund manager to use in determining investment criteria, and analyze gains and losses. The office produces military-specific mortality and other decrement rates; analyzes economic indicators and trends that are key to the development of long-term cost-of-living, basic pay, and trust fund investment income assumptions. Experts in the office can analyze the effect of any proposed direct change to the system, or the effect of indirect adjustments that affect the system (such as pay or force size adjustments).

The designers of the 1984 funding law realized the importance of independence in determining assumptions and methods that significantly affect the annual costs of the system. To demonstrate this importance, only one small example need be examined: in fiscal year 1985, we determined that the DoD military budget could have been lowered by \$5 billion by merely increasing the actuarial assumption for the annual assumed investment income rate by 1 percentage point. The law requires that the Board of Actuaries determine valuation methods and assumptions, review valuations of the system, determine the method of amortizing unfunded liabilities, report annually to the secretary of defense, and report to the president and the Congress on the status of the fund at least once every four years.

Key plan statistics appear in Table 6. There were almost 1.5 million active duty members, 1.6 million nondisability retirees, 111,000 disabled retirees, and 234,000 survivors as of September 30, 1998.

Future Challenges for Federal Pension Systems

One challenge facing federal pension systems has to do with the way in which the accounting is handled for federal plans that accumulate, and invest, assets in their fund portfolios. By law, any federal retirement assets

must currently be invested in U.S. Treasury securities, and these assets are counted in the government's "unified budget." As a result, only payments from "outside" sources (e.g., employee contributions) and payments made to "outside" sources (e.g., annuity benefits) affect the federal deficit. By contrast, government payments to federal pension systems do not affect the federal deficit. One result of this accounting framework is that policy debates tend to focus on contributions from employees and payments to annuitants, rather than structural changes such as an increase in retirement age, since the latter has little or no impact on the measured unified deficit.

To understand how federal pension financing affects the government budget, one first must recognize that an intragovernmental transfer consists of a debit from one government account and a credit to another. An example of an intragovernmental transfer is a payment of interest by the Treasury (debit) to a government pension trust fund (credit). These two transactions cancel each other out and have no overall effect on the federal deficit. Similarly, the accruing cost of retirement in a federal pension system is charged against the employing agency (debit), and some or all of these funds are transferred to the federal pension plan's trust fund (credit). Another federal entity, such as the Department of Treasury, may be responsible for making payments on the unfunded liability (debit) to the trust fund (credit). When the federal pension trust fund receives the income (debit) it invests its assets in special issue Treasury obligations (credit) bearing interest at rates determined by the secretary of the Treasury, taking into consideration current market yields for outstanding marketable U.S. obligations of comparable maturities. Each year the Treasury pays (debts) interest to the trust fund (credit). Each of these is an intragovernmental transfer with no effect on the Federal deficit. Indeed, only payments from the fund to retirees and refunds of contributions are counted as outlays from the federal budget and hence affect the deficit level.

Although budget flows are unaffected by the purchase of securities by a federal pension trust fund, this action does increase the gross federal debt and the debt subject to statutory limit, specifically the portion of the debt held by government accounts. The portion held by the public will not change. But the resultant increase in government debt subject to statutory limit tends to be small, likely having only a negligible effect on the timing of the next debt limit increase and the political issues surrounding that legislation.

Consequently, the decision to accumulate assets in a government-run pension fund has no effect on the annual government deficit, and only a minor effect on the national debt. From an accounting point of view, unless one invests federal pension funds outside the federal government, it is impossible to recognize long term liabilities generated within the system. But investing federal pension assets in capital market assets has been rejected in

the past by policymakers for many reasons, including (1) the risk associated with investing pension assets in less secure portfolios, (2) the possibility that the federal government might exert undue influence over private companies by virtue of its large holding of stocks and bonds, and (3) the potential difficulty of convincing the public to buy federal securities when the government invests elsewhere.

Given these complexities, it may be asked why should any federal pension system prefund or hold assets in excess of current pay-as-you-go benefit payout needs? One reason is that adopting a funding policy alerts policymakers to the long-term cost or savings implications of proposed benefit changes and unexpected annual experience (inflation, pay increases, mortality, actual interest income, etc.). These changes are then reflected in the budgets and integrated into policy and management decisions. For example, for many years it was widely believed that the military retirement system needed to be altered, and furthermore, policy required that benefit reductions could only apply to new entrants into the military. As a result of having pay-as-you-go accounting, there was no compelling budgetary reason to implement any changes because it takes twenty years before the defense budget would see the result of the policy change. But in 1984 when DoD moved to an entry-age normal cost funding method, it quickly became clear that there was a huge cost impact of changing benefits for new entrants, since the majority of members had less than six years of service. It took Congress and the administration less than two years after this new funding law was enacted to implement a totally new retirement system for new entrants. Another example of the beneficial effect of prefunding is that the long-term consequences of a federal pay raise are better measured. Focusing only on current cashflows reveals how a pay raise affects current year federal outlays, but ignores outyear effects. Of course, most funded plans require agency contributions that are a percentage of payroll, so a current increase in payroll automatically boosts retirement obligations not only in the first year, but in future years as well. Hence funding requires proper measurement of the full cost of federal compensation changes (including in the retirement benefits).

Another reason to fund a federal pension is that funding affords some additional security that annuitants will receive promised benefits when due. One might argue that since funding does not affect the Federal deficit, this security is apparent rather than real. Of course, the current focus on when the Medicare and social security trust funds will run dry indicates that voters and policy experts do perceive some risk associated with the time when outlays come to exceed tax receipts.

Other challenges also await the Federal and military pension systems in the future. Currently a strong economy combined with better financing suggests that these retirement systems are stronger than ever before. But poor

economic performance could generate pressures from employees, annuitants and taxpayers for future benefit and tax changes. For instance, automatic indexing of benefits after retirement is always controversial, and immediate budgetary savings can be achieved through cutbacks in the COLA. Indeed, FERS already has a "diet" COLA (reduced by 1 percent) and this may be adopted for CSRS and the military systems in the event of budgetary pressures. The federal systems are also likely to respond to current and future social security reforms. The social security retirement age has already been raised to 67, which will likely lead to pressure for change in the federal systems. The age 55 and thirty years of service under CSRS, and for older FERS employees, is gradually phasing out over time, but there will be pressure to increase the age 57 and thirty FERS provision as well as the age 60 and twenty provision.

Finally, workforce demographics coupled with improvements in medical care will create important challenges for the federal retirement programs in years to come. Both the military and civilian systems have diverse disability programs that should be coordinated more effectively, in order to ensure effective use of disabled employees and efficient design of the disability benefit plans. Postretirement medical costs are a major part of the federal budget and, as yet, have only been estimated approximately but not prefunded.¹⁴ The TSP thrift plan has been quite popular, and it is seen an effective element of FERS compensation. But as economic conditions change, and investment options are expanded, this plan will have to track and incorporate responses to these changes. There may be pressure for including military personnel into the TSP or an equivalent system in the future, though it is unlikely that a defined contribution plan would replace the existing defined benefit model.

Appendix: Postretirement Medical Plans for Civilian Employees and Military Personnel

While the main focus of this chapter is pension benefits, a brief discussion of retiree medical benefits is instructive. As above, a wide range of programs applies to these employees. The federal government does not prefund postretirement medical (PRM) benefits. However, federal agencies are required to report on the PRM liabilities.

Federal civilian employees and their dependents are covered by the Federal Employees Health Benefits Program (FEHBP); here, benefits and the share of contributions after retirement are identical to those that apply to employees before retirement (with the exception that postal employees are covered by FEHBP but pay a lower share of the cost of FEHBP than do non-postal employees). CSRS/FERS employees entitled to an immediate annuity at retirement and who participated in FEHBP at least five years immediately

before retirement can continue to participate in FEHBP after retirement. FEHBP permits retirees to choose among over 300 plans, but the largest one, a national Blue Cross/Blue Shield plan, covers half of the 1.9M participating annuitants. Retirees pay one fourth of the cost of most plans but do bear a higher percentage of the cost of the higher-premium plans. The total PRM liability was \$176B as of September 30, 1998, with an annual cost of \$23B. The system is not funded so participants and the government cover each year's costs (OPM 1999b).

Health care for military retirees and their dependents may be handled by three health care systems. First, military retirees and dependents can receive treatment at military hospitals. Second, retirees and dependents lacking access to a military hospital can participate in Tricare, which covered 6.8 million people eligible for current or future benefits in 1995 including current and former members of the armed forces and their dependents and survivors. The total unfunded liability was \$210B in 1998 with a current cost of 13.7 percent of pay for active duty members (Milliman and Robertson 1998). The third option open to military retirees is that they are also eligible to receive treatment from the health care system administered by the Department of Veterans Affairs.

Notes

1. However, CSRS employees have had two opportunities to elect FERS, and a 1999 change allows military members under the 1986 benefit formulas a choice between the higher 1980 benefits or a bonus.

2. Federal rules that apply to private sector contributory plans require the employer to pay the value of any deferred benefit in excess of the value of the refund. These rules require the former vested employee to be able to redeposit any refund and regain the prior service credit on return to employment. Both CSRS and FERS fall short of these requirements on private sector plans.

3. This and other information on CSRS/FERS was provided by the Federal Office of Personnel Management (OPM 1999a, b). Michael Virga, the Senior Actuary for Pension Programs of OPM, kindly provided the authors with additional unpublished data maintained by the Office of the Actuary of OPM.

4. The information in this section is taken from OPM (1998a) and the OPM website <www.opm.gov>.

5. If the employee is hired after age 38, the minimum benefit is less than 40 percent.

6. The normal cost is the percent of salary that, with interest, will pay the benefits of new entrants to the retirement plan. The Board of Actuaries determines the normal cost for a typical recent group of new entrants. This differs from the traditional approach of determining the cost from entry for all current active participants.

7. The unfunded liability of CSRS is the present value of all benefits for current active and retired participants less (1) the present value of future employee and agency contributions and (2) the fund.

8. See Hustead (this volume) for a detailed discussion of CSRS/FERS actuarial assumptions including illustrative rates.

9. The government matches 100 percent of the first 2 percent in employee contributions, and 50 percent of the next 3 percent. With the 1 percent automatic contribution, the total government contribution is 5 percent if the employee contributes at least 5 percent.

10. Personal communication from the Office of External Affairs, FRTIB, 1999.

11. This section draws from Mehle (1997).

12. New entrant projection provided by the DoD Office of the Actuary (personal communication, 1999).

13. Federal law calls for a Quadrennial Review of Military Compensation (QRMC). As with the Fifth QRMC, many of the reviews have at least partly focussed on retirement benefits. (DoD 1985)

14. See the Appendix for more discussion of postretirement health benefits for military and civilian federal employees.

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