DOCUMENTED BRIEFING

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The Effects of Workforce-Shaping Incentives on Civil Service Retirements

Evidence from the Department of Defense

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National Security Research Division

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Preface

The research presented in this documented briefing provides estimates of the effects of early retirement incentives, buyout incentives, and retention allowances on the retirement rates of federal employees covered by the Civil Service Retirement System (CSRS) in the Department of Defense (DoD). The research grew out of two interests.

The first was a general interest in understanding the effects of financial incentives, particularly those provided by retirement and pension plans, on retirement and separation behavior among workers. Our study provides information on these effects using workers covered by CSRS as a case study. Federal employees covered by CSRS are a useful case study because the CSRS pension formula is relatively simple to compute, and a large number of federal employees are covered by CSRS but not by any other retirement plan, such as Social Security.

The second interest related to the increasing numbers of retirements from federal employment that are predicted to occur over the next decade owing to the aging of the federal workforce. Most of these retirements will be among workers covered by CSRS. To the extent that federal agencies want to influence the timing of these retirements, there are a variety of financial incentives that could be used. Early retirement incentives and voluntary separation incentives (or "buyouts") can induce individuals to leave sooner than they would under the normal retirement option, by making the incentive for early departure more lucrative and the incentive to leave later relatively less lucrative. Retention allowances can be used to induce the deferment of retirement to a later date, thereby reducing retirements in the near term. By controlling the timing of retirements, personnel managers can better ensure that retirements and separations occur when they will have the least cost or have the least undesirable effects. Timing control can also help managers coordinate the hiring of qualified replacements, if such hiring is needed, with the timing of separations and retirements. Thus, these programs can help achieve effective workforce planning.

Our research consists of two separate strands of analyses. The first focuses on using administrative data on federal workers in DoD who are covered by CSRS to estimate alternative models of retirement behavior. These models provide estimates of the effects of financial incentives on retirement behavior. The results of this part of the analyses are more technical and are presented in a companion document, *The Retirement Behavior of Federal Civil Service Workers,* by Beth Asch, Steven Haider, and Julie Zissimopoulos, RAND and Michigan Retirement Research Center, UM-1-09, 2002.

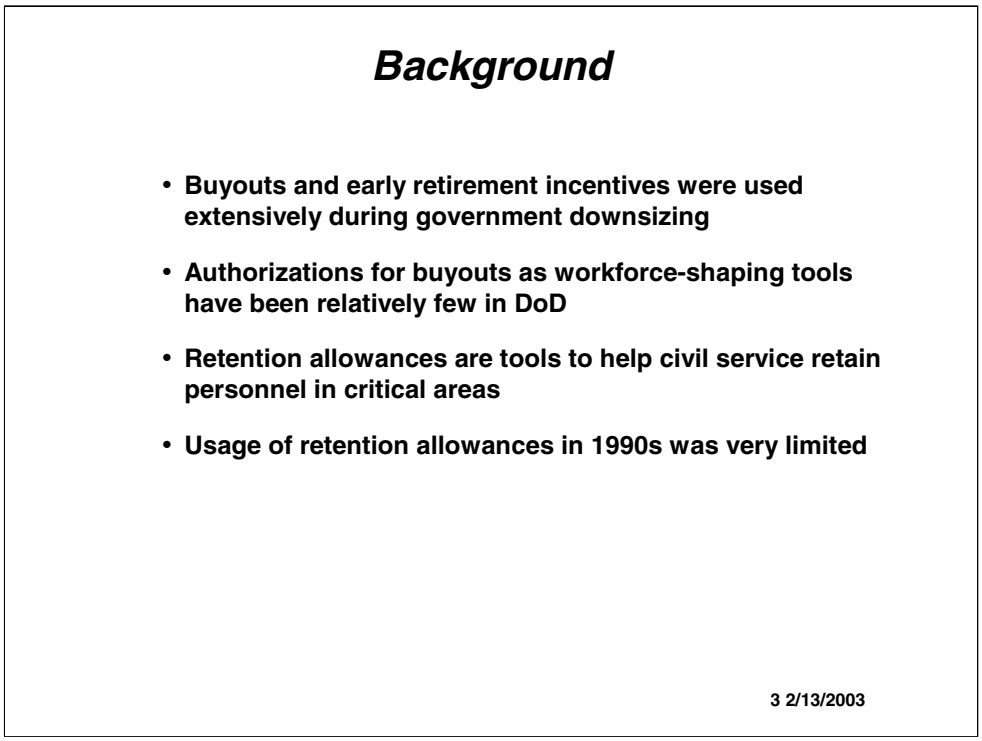
The second strand of analysis focuses on applying our estimates of the effects of CSRS incentives on retirement behavior to predict the effects of buyout and early retirement incentives as well as the effect of retention allowances

on the retirement and separation behavior of defense workers covered by CSRS. The results of this part of the analysis are presented in this documented briefing.

The research summarized in the technical paper was sponsored by the University of Michigan Retirement Research Center, funded by the Social Security Administration. That paper focused on how individuals generally respond to financial incentives to retire. The research summarized in this documented briefing results from RAND's continuing program of self-sponsored independent research. We acknowledge the support for such research provided, in part, by the independent research and development provisions of RAND's contracts for the operation of its U.S. Department of Defense federally funded research and development centers.

The research was overseen by RAND's National Security Research Division (NSRD). NSRD conducts research and analysis for the Office of the Secretary of Defense, the Joint Staff, the unified commands, the defense agencies, the Department of the Navy, the U.S. intelligence community, allied foreign governments, and foundations.

This documented briefing should be of interest to DoD and other leaders with responsibility for implementing buyout, early retirement, and retention incentives for federal civil service workers. It should also be of interest to policymakers and researchers concerned with the looming retirement bulge in the civil service and the effects of retirement and other financial incentives on the retirement behavior of civil service employees.



The research summarized in this briefing estimates the effects of three compensation policies on the financial incentive to retire and on the probability of retirement. These policies are the special voluntary separation incentive program (VSIP) or "buyout," the voluntary early retirement authority (VERA) or early retirement option, and the retention allowance. The first two programs are intended to increase the financial incentive to leave voluntarily, while the third is intended to increase the financial incentive to stay in the civil service.

Both VSIP and VERA were used by federal agencies to reduce federal employment during the 1990s. These programs induced voluntary separations among workers who would otherwise have been involuntarily separated because they worked in organizations that were identified for possible downsizing. Between 1993 and 1999, the Department of Defense (DoD) paid about 141,000 VSIP buyouts to its civilian employees to support its post–cold war drawdown.

The General Accounting Office (2001a) and the U.S. Senate Committee on Governmental Affairs (2001) have argued that downsizing resulted in a federal workforce that has a skill and experience mix that is out of balance with the mission of federal agencies. Both VSIP and VERA have been identified by the Office of Personnel Management (OPM) as tools to help federal managers "shape" the experience and skill mixes of their workforces (U.S. Office of Personnel Management, 2001b). By providing federal workers with an incentive to retire early or separate, it is hoped that managers will be better able to hire (or even outsource) replacement workers with different skills or experience levels.

So far, the authority for buyouts and early retirement for workforce shaping purposes has been limited in the DoD. The National Defense Authorization Act (NDAA) for FY 2001 permitted the DoD to use buyouts in conjunction with optional retirement, even without downsizing. The NDAA for FY 2002 expanded this authority to use buyouts in conjunction with either early retirement or resignations, in addition to optional retirement. However, the law restricted the use of buyouts to 2,000 employees in FY 2002 and to 6,000 in FY 2003. Given that the DoD had about 290,000 employees eligible for early retirement and another 107,000 eligible for optional retirement, these authorities are quite small relative to the defense civilian workforce (U.S. Office of Personnel Management, 2001a).

Retention allowances have been viewed as a tool to help civil service managers compete for personnel with critical skills who might otherwise leave the civil service. Despite that intent, available evidence suggests that retention allowances have not been widely used in the past. The Office of Personnel Management estimated that retention allowances were given to less than 1 percent of Executive Branch employees in 1998 (U.S. Office of Personnel Management, 1999). Some of the reasons identified by OPM for the low usage included lack of funds and limited need for greater retention during the government downsizing. The report also stated that the authority to approve the usage of retention allowances tended to reside at high levels within the organization, and the burden of justifying such payouts discouraged lower-level managers from requesting their use.

If used, retention allowances may help managers to target the retention of senior employees with critical skills or in leadership positions. The question our research addresses is, What is the predicted effect of retention allowances, buyouts, and early retirement benefits on CSRS retirement behavior?

Preview of Findings

- **The policies we analyzed markedly change the financial incentive to retire among DoD civilians**
- **The effects on retirement behavior of buyouts and retention allowances are also sizable**
- **Early retirement benefits have a dramatic effect on predicted early retirement rates**
- **Greater usage could have important effects on retirement behavior**

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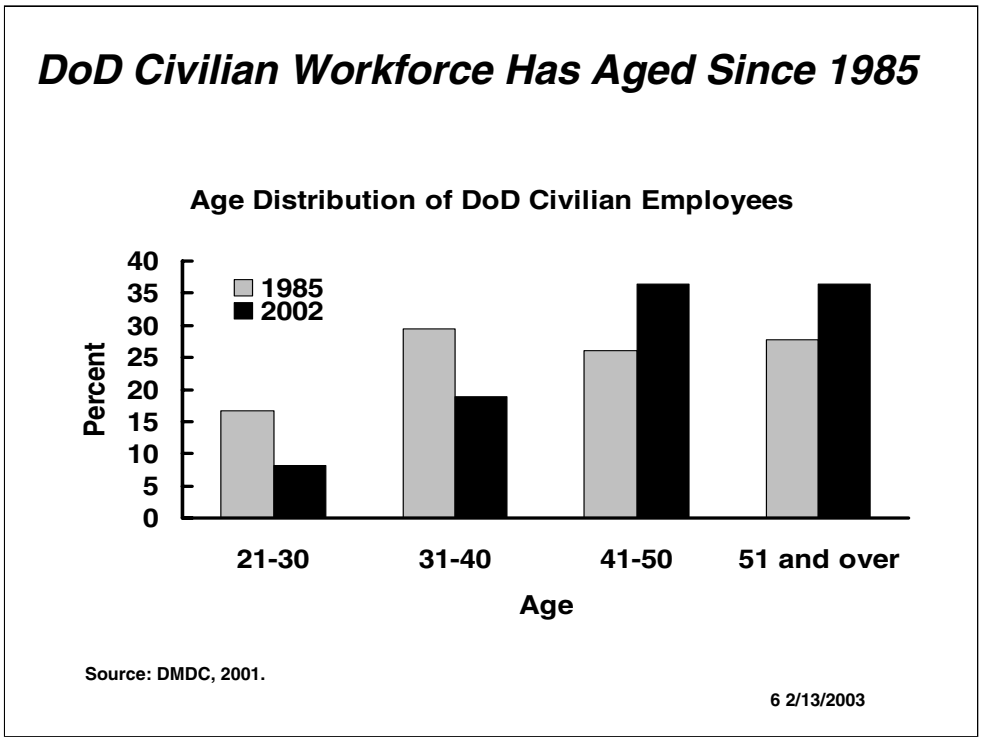
To summarize our main findings, the workforce-shaping polices we studied were generally estimated to have sizable effects on the financial incentive to retire or separate from the civil service and on predicted retirement behavior. The predicted effects of early retirement benefits were especially large, more than doubling the separation rates of those age 50 with more than 20 years of service (YOS).

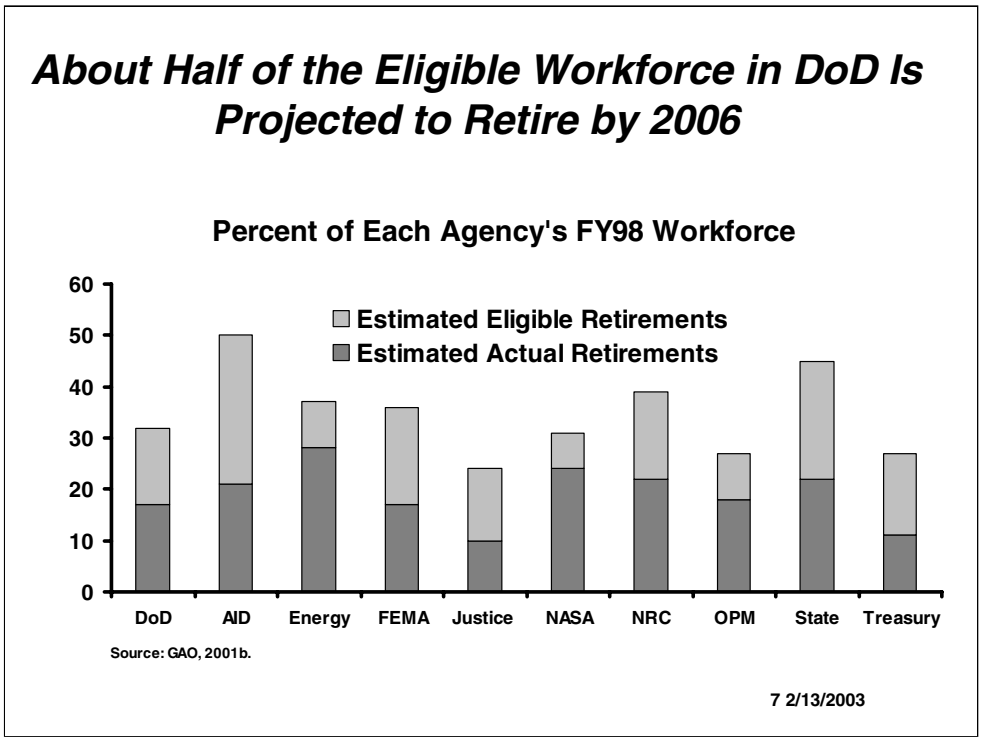
Thus, the main conclusion of our analysis is that these polices could have important effects on the retirement and separation behavior of federal civil service personnel covered by the CSRS.



A key reason to consider increased usage of these workforce-shaping policies is to respond to demographic trends that will alter the experience and presumably the skill mix of the civil service workforce in the coming years. One of the most dramatic personnel changes that has occurred in the federal civil service over the past two decades has been its changing age composition. This chart shows the age distribution of DoD civilian workers in 1985 and 2002, according to the Defense Manpower Data Center (DMDC) civilian personnel data files. In 1985, 54 percent of DoD civilians were over age 40. In 2001, 73 percent were over the age of 40 and about a third of civilian defense employees were over age 50.

Similar trends have occurred in the federal civil service as a whole. About half of all civil service workers were over age 40 in 1985, according to the Congressional Budget Office (2001). Fifteen years later, that figure had risen to about 75 percent.

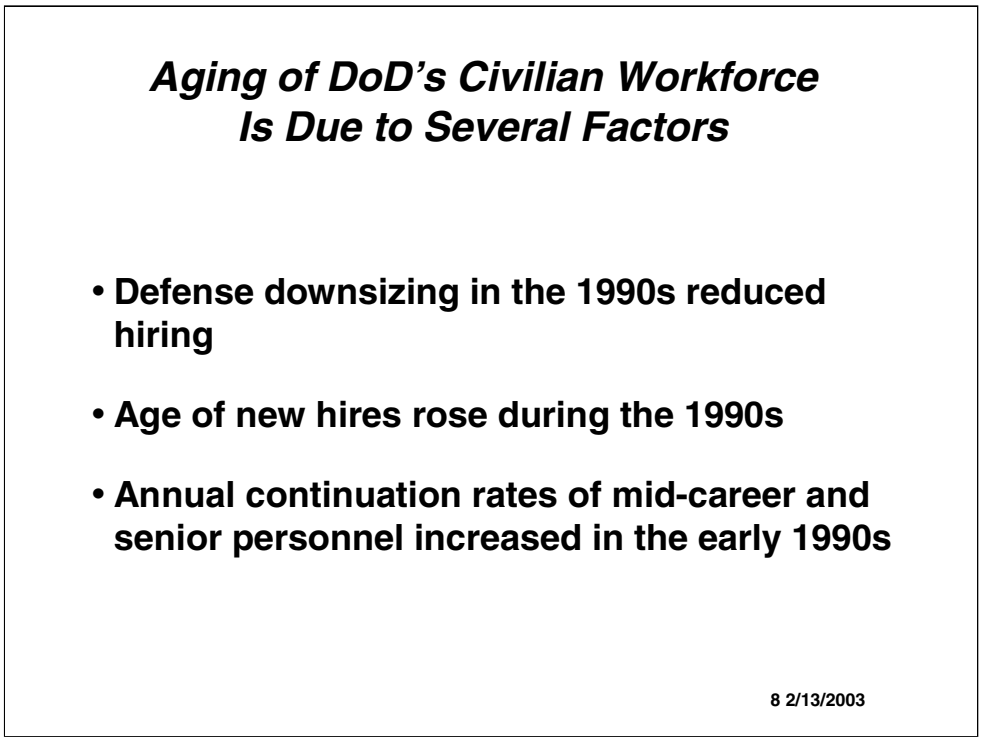
Although the working population in the United States as a whole has also aged, it is still relatively young compared to the federal workforce. Thus, in 1999, only about a third of those employed in the United States were age 45 or older. In contrast, about 60 percent of federal civil service workers were over age 45. The aging of the federal civilian workforce has raised questions about whether the federal government, including the DoD, will have the appropriate skills and experience mixes to meet future requirements.



As the DoD workforce ages, almost a third of its civilian workers are projected to be eligible to retire by 2006, and about half of that group is expected to actually retire (U.S. General Accounting Office, 2001b). This chart shows the estimated percentage of various federal agency's FY 1998 workforce that will be eligible for optional retirement by FY 2006, as computed by GAO. The specific agencies were chosen to reflect the range of GAO's estimates. Optional retirement refers to retirements at the normal voluntary retirement age and YOS combinations defined under the employee's retirement plan. The projections combine employees under various retirement plans, and the age and YOS eligibility criteria vary among the plans. The eligibility projections were made by applying the eligibility criteria of each plan to the FY 1998 workforce, and the retirement projections were based on a forecast model GAO developed using data from 1988 to 1997.

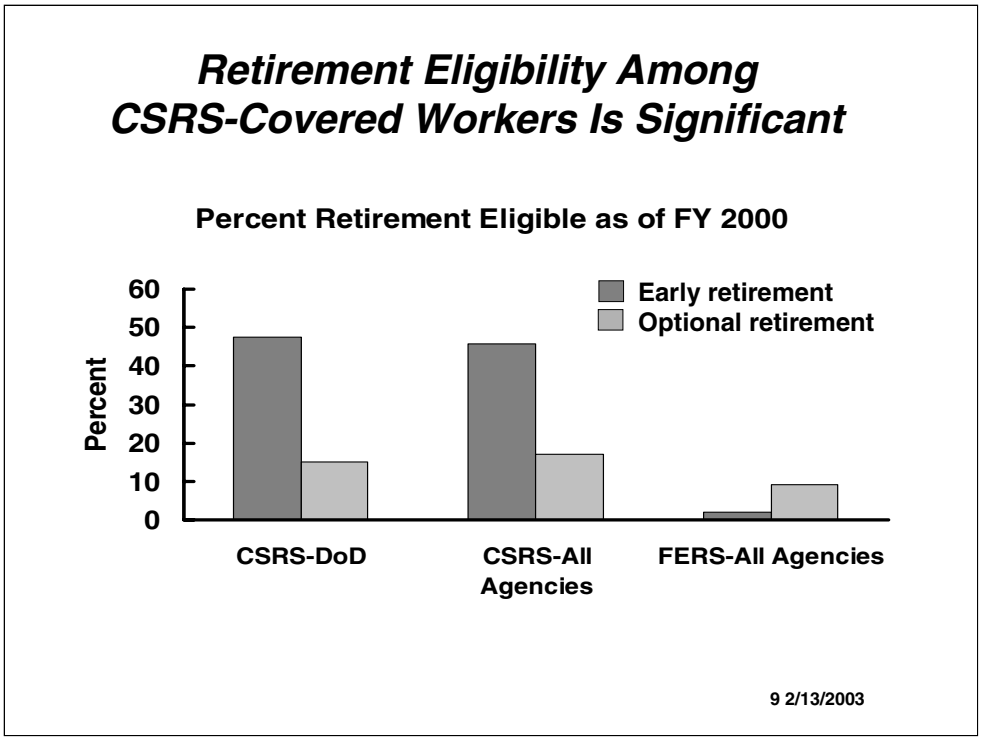
This chart shows projected eligibility rates that vary from a low of about 25 percent for the Justice Department to about 50 percent for the Agency for International Development. About three-quarters of the agencies GAO studied have an eligibility rate of 30 percent or more.

These eligibility rates represent an increase over estimates for previous years. About 23 percent of the entire FY 1998 federal civil service workforce will be eligible to retire by 2006. This figure is up from 16 percent, the fraction of the FY 1990 federal workforce that was eligible for retirement by 1997. Because of the increase in the eligibility rate, GAO estimated that the total number of federal employees becoming eligible to retire for the first time will nearly double between 1999 and 2007.



The aging of the DoD's civilian workforce is partly due to the approach it used to reduce the size of its workforce in the aftermath of the cold war. Employment in the DoD fell from 1.1 million in 1988 to about 700,000 in 1999. One of the ways the DoD accomplished its downsizing was to hire fewer new workers. Using data on DoD civilian personnel provided by the Defense Manpower Data Center, we calculated that the fraction of the permanent defense workforce with fewer than two YOS fell from 8 percent in FY 1988 to 2.7 percent in FY 1996. Furthermore, the average age of those who were hired rose slightly. As a result, the fraction of new hires age 40 and older rose from 18.5 percent in 1988 to 20.5 percent in 1994, a time span of just six years.

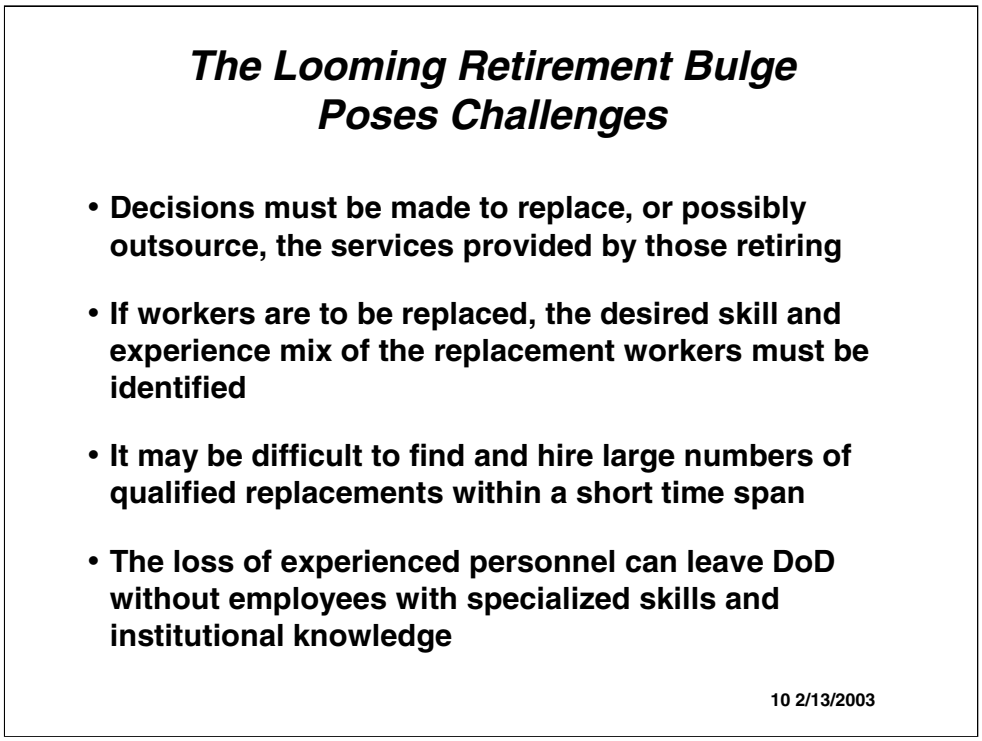
Another factor contributing to the aging of the federal workforce is the high annual continuation rates among mid-career and senior personnel in the DoD. We computed the fraction of permanent full-time DoD civil service workers at the beginning of each fiscal year who continued to remain in service until the end of that year. During the 1980s, the annual continuation rate of permanent full-time civilian employees held steady at about 97 percent for those ages 41 to 45 and at about 98 percent for those ages 51 to 55. During the first half of the 1990s, the annual rates of mid- and senior-career workers rose slightly in the DoD. In 1995, the annual continuation rate of defense workers was 97.7 percent for those workers ages 41 to 45 and 98.6 percent for those ages 51 to 55. The net result of reduced hiring, increased retention of mid-career and senior personnel, and increased hiring of older workers is an older workforce in the DoD.



The General Accounting Office (GAO) projection of retirement rates in 2006 did not distinguish among federal employees in terms of their retirement plan coverage. That distinction may be important because the incentives to retire may differ under different plans and the fraction of workers eligible to retire may differ.

Most federal civil service workers are covered by one of two retirement systems, the Civil Service Retirement System (CSRS) or the Federal Employees Retirement System (FERS). As we describe later in the briefing, CSRS is a defined benefit pension system that was created in the 1920s. Those covered by CSRS are not covered by Social Security. Unlike CSRS, FERS is a three-part plan that includes a defined benefit plan, a defined contribution plan, and Social Security coverage. The value of the defined contribution portion of FERS depends on the level and timing of contributions to the retirement fund and on how the fund performs as an investment vehicle. FERS coverage began in 1987 and covers all new federal hires since 1984. Those hired before 1984 and who had more than 5 YOS were "grandfathered" under CSRS and were not required to change to FERS. However, those covered by CSRS had the option to transfer to FERS voluntarily during specific open enrollment windows in 1987–1988 and in 1998. Previous research shows that individuals who have many YOS under CSRS had little financial incentive to switch to FERS (Asch and Warner, 1999).

Because CSRS is an older system and because relatively few individuals covered by CSRS had an incentive to switch to FERS, those covered by CSRS tend to be older and have more YOS than those under FERS. Not surprisingly, retirement eligibility is higher among those covered by CSRS, not only in the DoD, but across all agencies in the civil service.

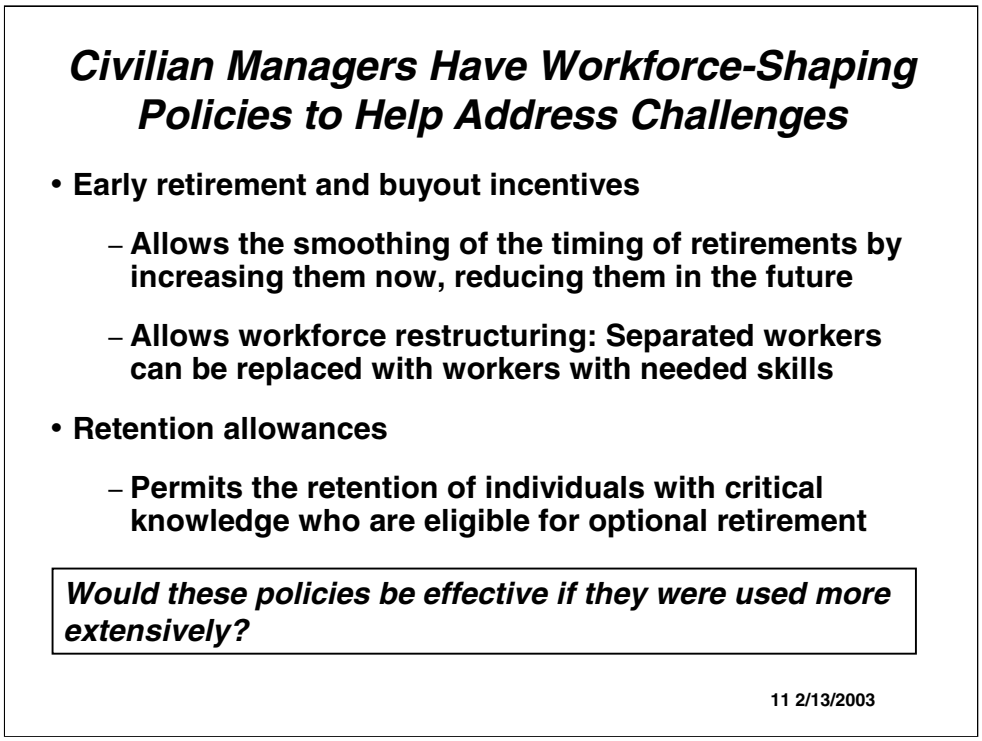


The large number of retirements that are projected to occur in the coming decade will result in a decrease in the size of the DoD civilian workforce, if no other changes are made. DoD managers will need to decide how to respond to such a large decline in such a relatively short time span. First, they will need to decide whether to replace all of the workers who are retiring. If so, one approach is to outsource the services provided by those who retired. Another approach is to increase hiring or increase retention of the current workforce. In either case, managers must define what their workforce requirements are in terms of the desired skill and experience mixes, and they must identify how they will meet those requirements in terms of retention, recruiting, or outsourcing.

Even with a workforce plan, the job of replacing a large number of workers or of outsourcing many services in a short time span is more difficult and more costly than it would be if done over a longer time span. The cost of generating and screening large numbers of qualified applicants tends to be higher when done in a short time frame.

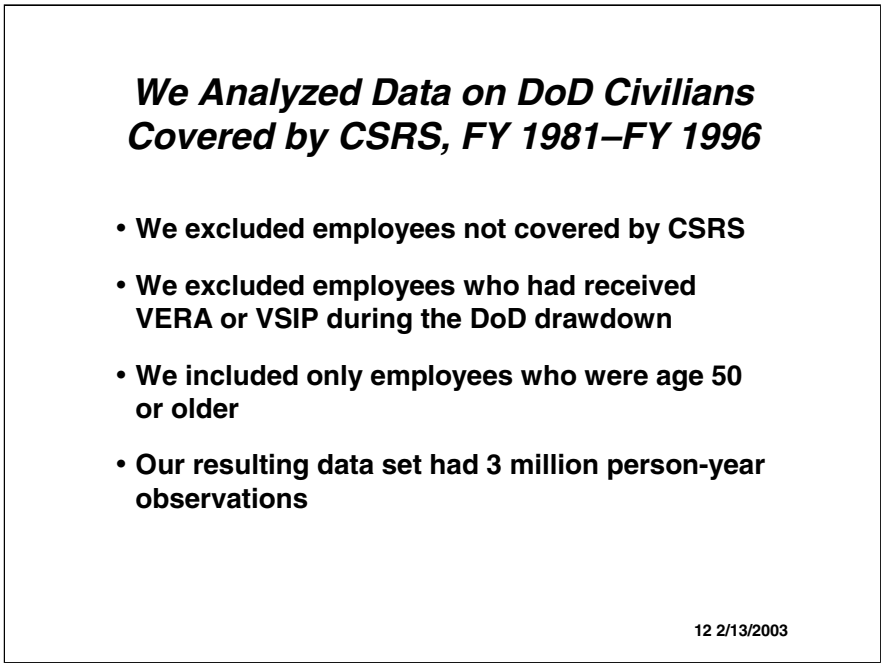
Another challenge is competition with the private sector for workers with the requisite skills. Private-sector firms also face the problem of looming retirements among the baby boom generation, and, presumably, they will also be seeking junior and mid-career replacement workers. The degree of competition from the private sector will depend on the skills that are sought and on the factors that influence the demand and supply of personnel with those skills, such as relative pay levels.

Even if the civil service can effectively compete for qualified replacement workers, some retention among retirement-eligible personnel is desirable because they possess institutional knowledge that may be impossible to replace quickly.



Several policy tools are available to federal workforce managers to address the looming retirement bulge. Early retirement and voluntary separation incentives can help to smooth the timing of retirements. By increasing early retirements and voluntary separations in the current year, the number of future optional retirements is reduced. Controlling the timing of retirements can help managers ensure that retirements and separations occur when they will have the least cost or the least undesirable effects. Furthermore, controlling the timing of retirements and separations enables managers to coordinate the timing of separations with the hiring of replacements. Thus, early retirement and buyout incentives can help achieve effective workforce planning. Similarly, retention allowances can help managers retain retirement-eligible personnel with critical skills or knowledge until replacements can be found and trained.

Because these policies have not yet been extensively used as workforce-shaping tools targeted toward those nearing or already eligible for retirement, their effectiveness as such is not entirely clear. Their success as drawdown tools does not necessarily indicate they will be successful for workforce-shaping purposes. For example, the buyout may have been successful during the drawdown because individuals who received the buyout offer recognized that failure to take the offer could result in involuntary separation at a later date. Without an implicit downsizing "threat," the buyout might be far less effective as an incentive. Our approach to studying the probable effects of these policies is to use our estimates of the relationship between financial incentives and retirement behavior to predict how retirement behavior would change under different incentives. The next part of the briefing discusses our data and methodology, briefly reviews the key features of CSRS and the three policies, and summarizes the results.



To conduct our analysis we used civilian personnel administrative data for all permanent full-time personnel in the DoD who were covered by CSRS during the period FY 1981 to FY 1996. The data were provided by DMDC. Given that DoD is the largest civil service employer, after the postal service, and accounts for about 40 to 50 percent of civil service employment, depending on the year, our analysis is relevant to a substantial portion of the entire federal civil service.

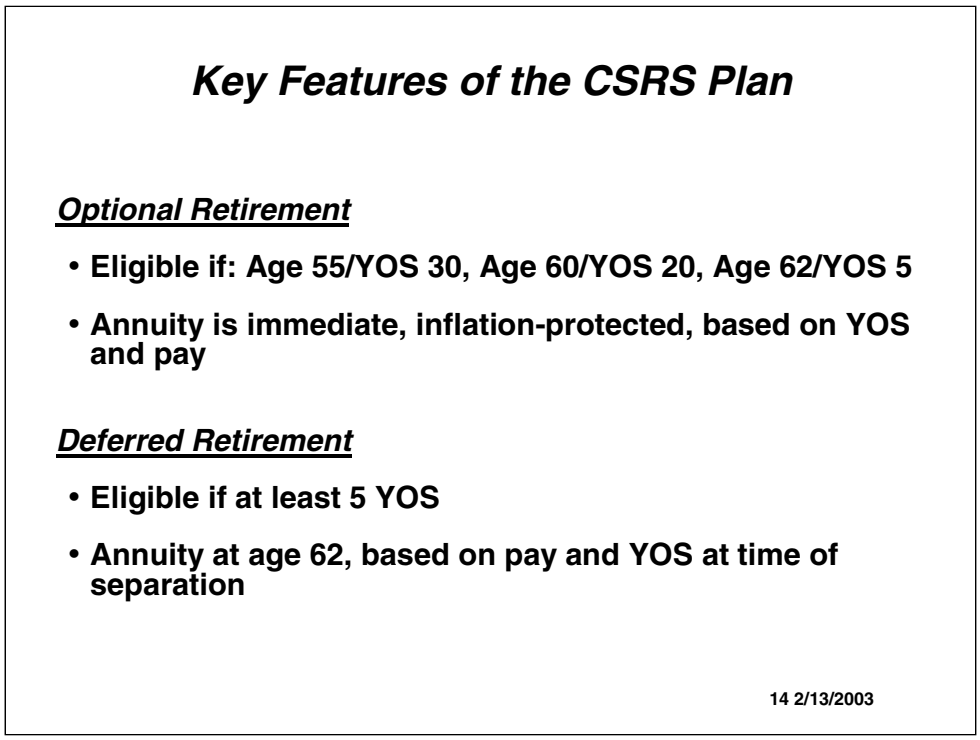
We limited our analysis to those covered only by CSRS. We deleted from our data those who are under any other federal retirement plan, including FERS, CSRS-interim, and CSRS-offset. We also excluded civilians receiving military retirement benefits. By making these exclusions, we could focus entirely on the retirement behavior of those covered by CSRS without worrying that observed behavior was a response to the influence of other retirement systems.

We chose only CSRS-covered personnel for several reasons. First, the retirement plan is based on a relatively simple formula. Therefore, we were more likely to accurately compute each individual's expected retirement annuity under CSRS. Second, employment that is covered by CSRS is not covered by Social Security. In other words, CSRS-covered workers do not get credit for their service under the Social Security program. Therefore, the retirement behavior of those under CSRS is not confounded by the influence of Social Security. Since it is possible that some individuals under CSRS worked in Social Security–covered jobs before they entered the civil service, we limited our analysis to those who had at least 15 YOS in the federal

government at age 50. We limited our analysis to those age 50 and older, and we did not model the factors that influence an individual's incentive to stay in the civil service until age 50.

Finally, we excluded from our analysis those individuals who received VERA (the early retirement benefit) or VSIP (the buyout incentive) during the defense drawdown in the the 1990s. Including them would have caused us to overestimate the effect of financial incentives on voluntary retirement and separation because workers who did not take the VERA or VSIP offer during the drawdown were likely to be involuntarily separated at a later date. The acceptance rate of these programs in the 1990s was quite high, nearly 90 percent, according to the DoD's Civilian Personnel Management System. Because we excluded individuals who accepted VERA and VSIP during the drawdown, our estimates of the effects of the early retirement and buyout programs workforce-shaping policies are not estimates of the past success of these programs.

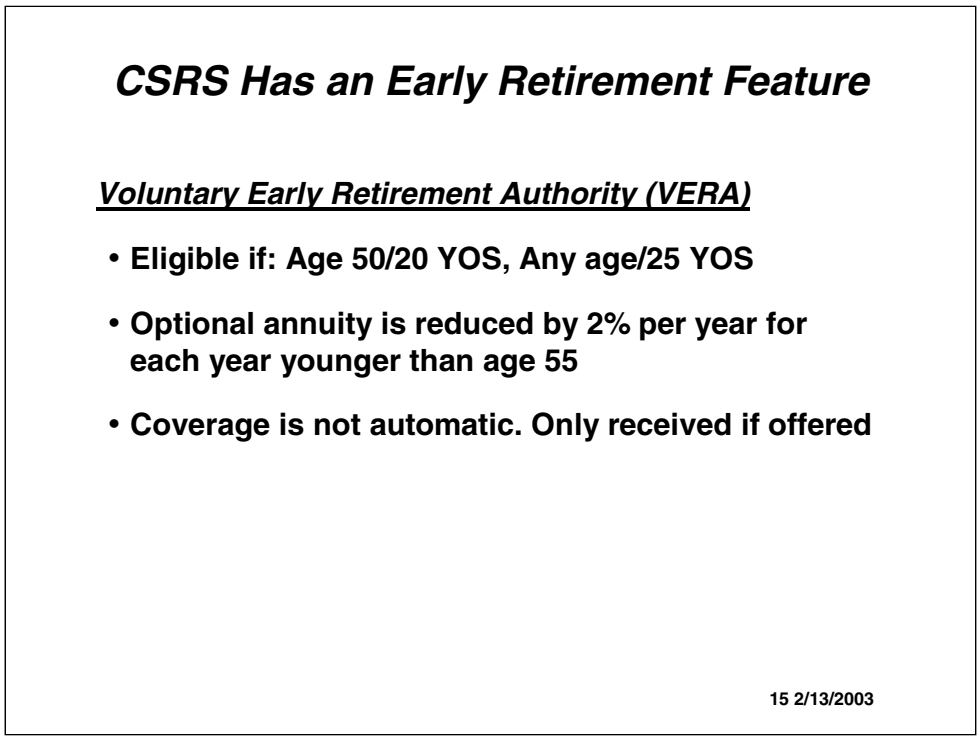
After making these exclusions, our analysis file had approximately three million observations. All observations were used to estimate the regression model of the effects of CSRS incentives on the probability of retirement. However, to conduct the analysis of how the workforce-shaping policies affect the financial incentives to retire and to predict the probability of retirement using the regression model estimates, we used a 1 percent random sample of the data to reduce computation time.



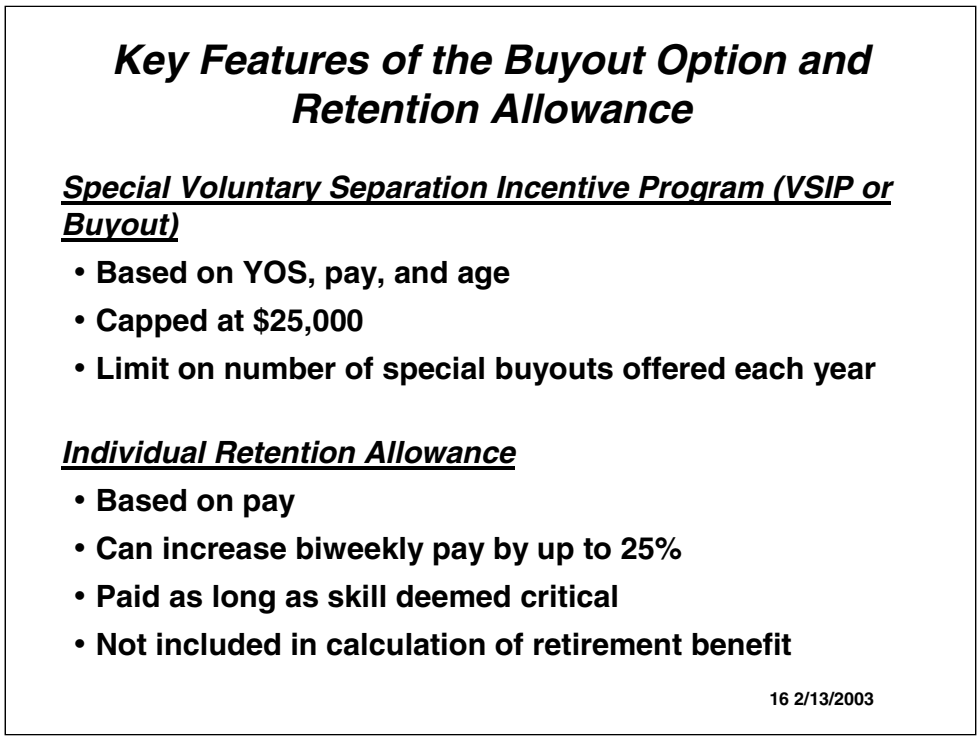
The next two charts briefly review some key features of CSRS, VERA, VSIP, and the retention allowance. A more detailed description can be found in the *Federal Employees Almanac* (Federal Employees News Digest, 2002).

CSRS is a defined benefit pension program that provides an immediate, inflation-protected pension annuity to eligible personnel. To be eligible for optional retirement, the employee must be at least 55 years old with at least 30 years of covered service (YOS), at least age 60 with at least 20 YOS, or at least age 62 with at least 5 YOS. Thus, a worker who reaches 30 YOS at age 56 is eligible to retire immediately. The CSRS pension annuity is computed based on a formula that incorporates YOS and the average of the highest three years of base pay.

Individuals who resign or separate before reaching eligibility for optional retirement are eligible for a deferred CSRS pension annuity if they have at least 5 YOS when they separate. The annuity is not paid immediately but begins at age 62. The pension annuity is computed using a formula that incorporates YOS and the highest three years of pay at the time of separation. For example, an individual covered by CSRS who resigns at age 50 with 10 YOS could get a deferred annuity that begins payments at age 62 and that is based on pay and YOS at age 50. The annuity is not adjusted for the effects of inflation between ages 50 and 62.



CSRS also has an early retirement provision. These benefits are not automatic and can only be offered to those selected for the program. To be eligible, an individual must be at least 50 years old with at least 20 YOS or be any age with at least 25 YOS. The annuity payment begins immediately at the time of separation and is based on YOS and pay at the time of separation. The annuity is reduced by 2 percentage points for every year younger than age 55. For example, an employee who is age 52 with 20 YOS could take the VERA benefit, if offered, but the annuity would be reduced by 6 percent.



The special voluntary separation incentive, a buyout, is computed using a formula that bases that buyout on the employee's YOS, weekly pay, and age. The maximum benefit is $25,000, and federal employers have a limited authority to offer buyouts. Our analysis computes the buyout for each individual in our data set using the published formula.

The retention allowance is a percentage of weekly pay and is paid for as long as the employee's skill is considered critical. The retention allowance can increase pay by up to 25 percent. Importantly for our analysis, retention allowances do not increase base pay for the purposes of calculating an employee's CSRS pension annuity. Our analysis assumes that individuals would be paid a maximum retention allowance of 25 percent of their pay for the rest of their career. Consequently, our estimates represent the upper bound—or the maximum effect we could expect—on the financial incentive to retire and on predicted retirement behavior as a result of the retention allowance program.

Overview of Analytical Approach

- **Analyze the effects of workforce-shaping policies on the incentives to retire**
  - **Compute financial incentive to retire under CSRS**
  - **Compute how policies change the incentives**
- **Analyze the effects of the policies on retirement rates**
  - **Estimate effect of CSRS financial incentives on retirement**
  - **Predict retirements when financial incentives change because of workforce-shaping policies**

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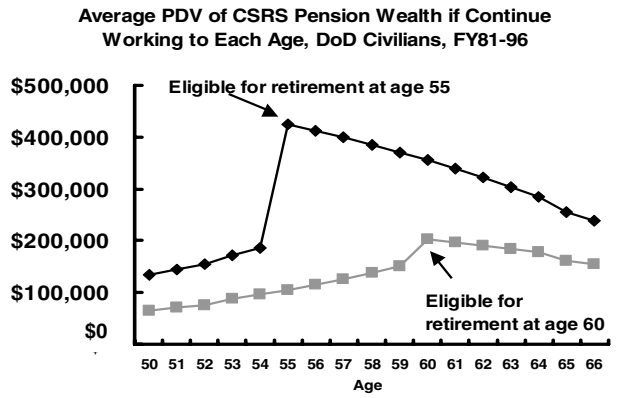
Our analysis has two main parts. The first part focused on the financial incentive to retire. For this part, we first computed the financial incentive under CSRS to retire in the current period rather than stay in the civil service until some future date. We then computed how that financial incentive changes as a result of the three workforce policies. We show these results first.

The second part uses our model estimates of the relationship between the CSRS financial incentive to retire and actual retirement behavior to predict the effect of the policies on retirement behavior, holding constant observed job and demographic changes. After briefly summarizing our modeling effort, we then present the results of this part of the analysis.

Computing the Financial Incentive to Retire for Each DoD Civilian Involved Two Steps

Step 1:

Compute expected CSRS pension wealth at current age and at each possible future retirement age



Expected CSRS pension wealth = The present discounted value (PDV) of the CSRS annuity, accounting for inflation, discount rate, earnings growth, and survival probabilities

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The computation of each individual's financial incentive to retire under CSRS rather than to continue working at each possible retirement age involved two main steps. First, for each employee in each year of our data, we computed the discounted present value of their CSRS retirement annuity if they retired or resigned at their current age and YOS. This figure represents their CSRS retirement wealth at their current age. The computation assumed a real discount rate of 3 percent, an inflation rate of 3 percent, and a maximum life span of 99 years. The computation also incorporates a life table to discount the pension annuity by the probability the employee would die before reaching each future age. We also computed expected CSRS pension wealth at every future retirement or separation age. This computation assumed an annual real growth in earnings of .25 percent if the individual continues to work. The .25 percent assumption is consistent with the observed earnings growth in our data.

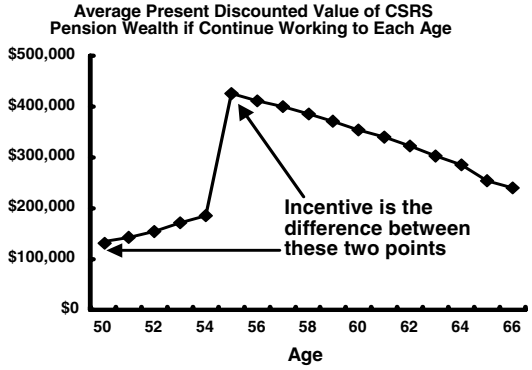
The figure shown in this chart shows the average results of these calculations for individuals who become eligible for optional retirement age at 55 (the top line) and at age 60 (the bottom line). A notable feature of the graph is that expected CSRS pension wealth jumps up at the optional retirement ages. Between age 54 and age 55 in the top line, CSRS pension wealth increases because individuals who leave at age 54 cannot begin collecting CSRS pension benefits until age 62. If these individuals stayed an additional year and left, instead, at age 55, they would receive their CSRS benefits immediately. Because of discounting, the fewer years over which the annuity is paid, and the effects of inflation between age 54 and age 62, CSRS retirement wealth increases markedly between separation at age 54 and age 55. Therefore, CSRS embeds a strong incentive to stay until eligibility for optional retirement is reached, because an individual eligible to retire age at 55 would experience a significant financial loss under CSRS if he or she left before age 55.

The timing of retirement is also influenced by factors other than the financial incentive to retire embedded in CSRS. Some of these factors are incorporated into our analysis of retirement behavior, such as civil service pay. Other factors, such as assets, health, and the ability to borrow against future pension payments, are necessarily left out of our analysis because they were not captured in our available data.

Step Two Compares the Civilian's Best Future Pension Wealth with Current Pension Wealth

Step 2:

Compute the difference between expected CSRS pension wealth at worker's current age and at the age when expected pension wealth is at a maximum



The CSRS financial incentive to retire today rather than later is the difference in the current and the maximum pension wealth

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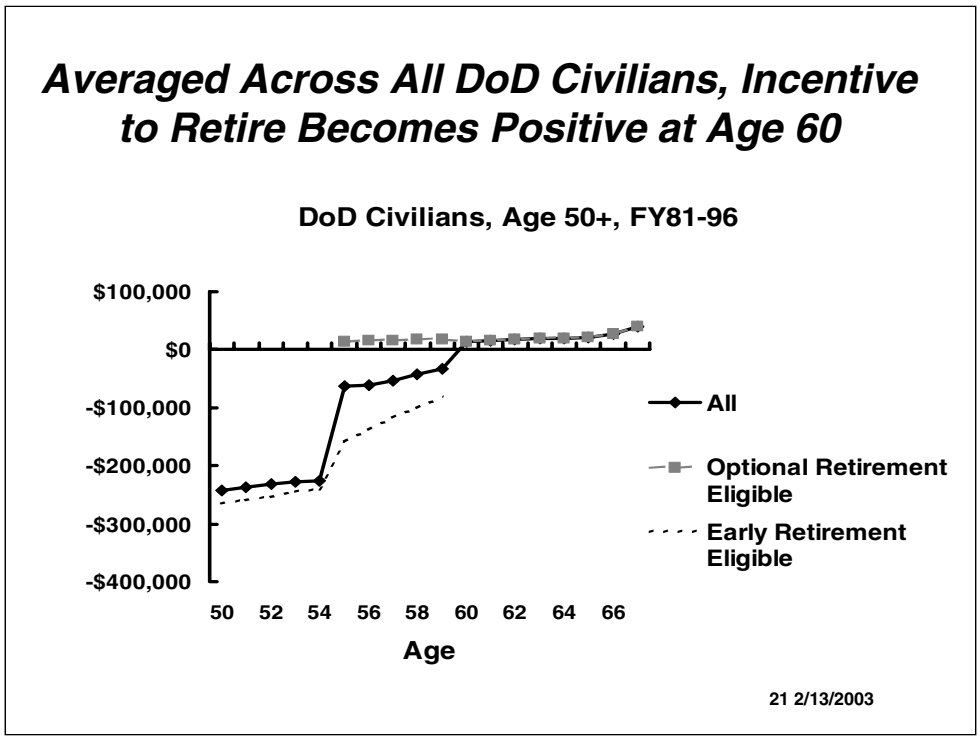
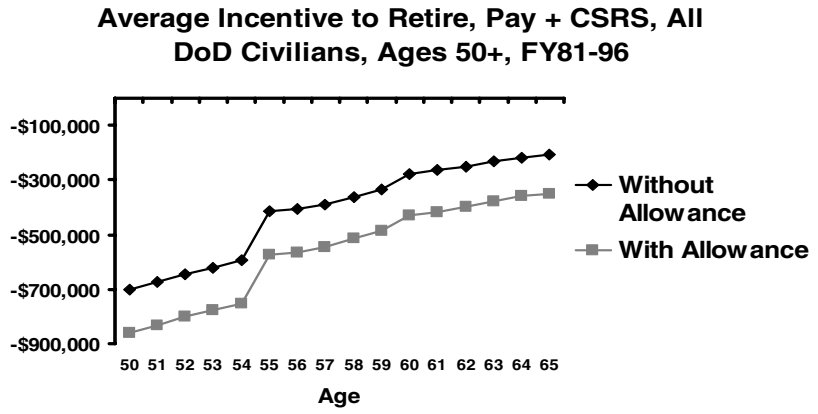
The second step is to compute the difference in expected CSRS pension wealth at the worker's current age and at the age when expected CSRS pension wealth is at a maximum. For individuals who are age 50 and are eligible for optional retirement at age 55, pension wealth is maximized if they retire at age 55 (as shown in the graph). Thus, such a person's financial incentive to retire at age 50 is the difference between CSRS pension wealth at age 50 and at age 55. As shown in the graph, the incentive is negative, equal to about –$300,000.



We computed the CSRS financial incentives to retire for every worker in every year for which we have data. The mean incentive, by age, for all individuals, regardless of their eligibility status for optional or early retirement, is shown as the black line in this chart. We find that the average net incentive to retire in the civil service is negative until age 60 and then becomes positive. Thus, on average, CSRS embeds a negative incentive to retire for those younger than age 60 but has a positive incentive beyond age 60. These averages reflect the YOS distribution of civilian employees at each age in DoD. A given individual may have a profile that differs from the average. The average financial incentive also differs among subgroups. The dark gray line shows the average incentive among only those eligible for optional retirement. On average, the incentive is positive at all ages. The dashed black line shows the average among those eligible for early retirement benefits, if early retirement were offered. On average, the incentive is negative at all ages.

The purpose of the buyout and early retirement programs is to increase the employee's financial incentive to separate or retire at his or her current age. Thus, these programs are hypothesized to shift up the profiles shown in this chart.

Retention Allowance Hypothesized to Reduce Average Incentive to Retire



Incentive = Current PDV (Pay+ Pension Wealth) – Maximum PDV (Pay+ Pension Wealth)

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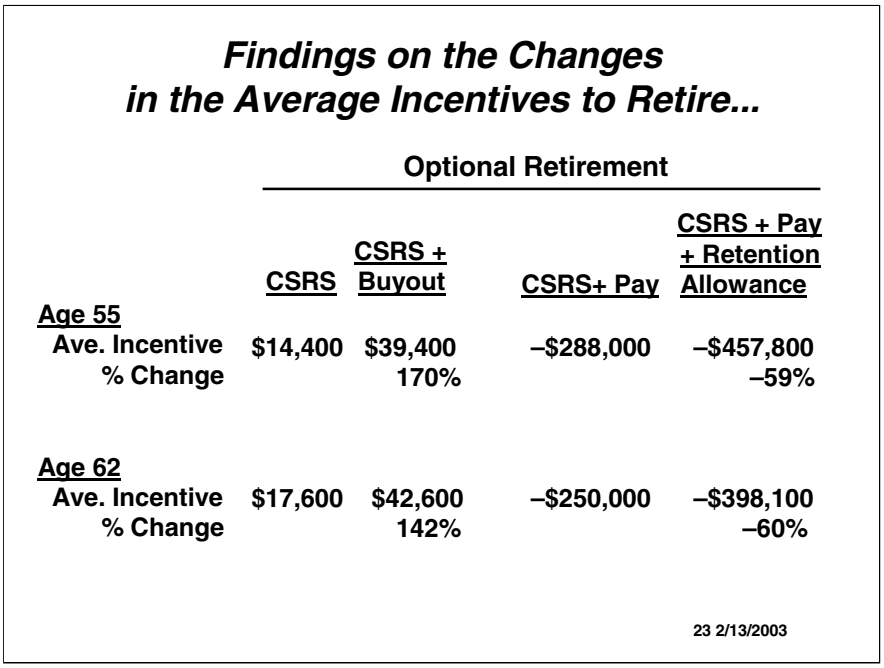
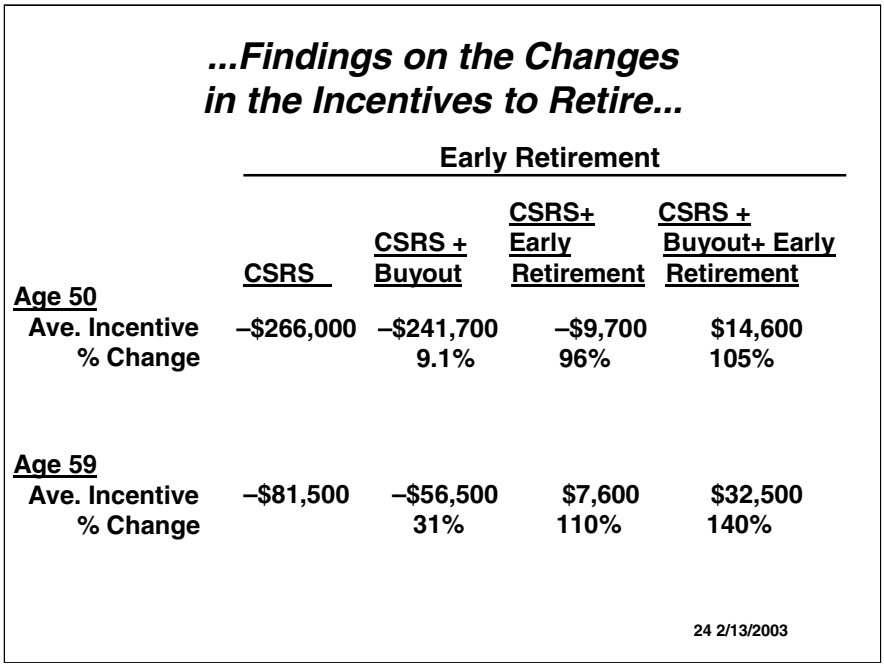
The intent of the retention allowance is to induce individuals to defer separation and continue work in the civil service by increasing weekly pay. Because the retention allowance increases pay for as long as it is offered but does not affect retirement benefits, we must include current and future earnings as well as CSRS benefits in the computation of the incentive to retire under CSRS.

When earnings are included, the average financial incentive to retire is negative, regardless of whether we include the retention allowance or not. Thus, the average incentive to retire does not become positive at age 60, as in the previous chart. This chart shows the average incentive to retire by age, regardless of retirement eligibility status. Adding the retention allowance causes the average incentive to retire to become more negative. It is important to note that these calculations assume that individuals exit the labor force when they leave the civil service and consequently have no earnings after they separate. If, instead, we assumed that individuals took a new job with positive earnings, the financial incentive to retire shown in this chart would be less negative.



This chart shows the results for those eligible for optional retirement. The average incentive to retire immediately under CSRS, in the absence of the buyout program, is $14,400 at age 55 and $17,600 at age 62. When we recomputed the financial incentive under the assumption that every individual would receive a voluntary buyout up to the maximum of $25,000, the average incentive increases dramatically by 170 percent to $39,400 at age 55 and by 142 percent to $42,600 at age 62. The dollar amount of the buyout is computed based on a formula that depends on age, YOS, and pay, as discussed earlier. Thus, the buyout has a sizable effect on the average incentive to retire among those eligible for optional retirement in the DoD data.

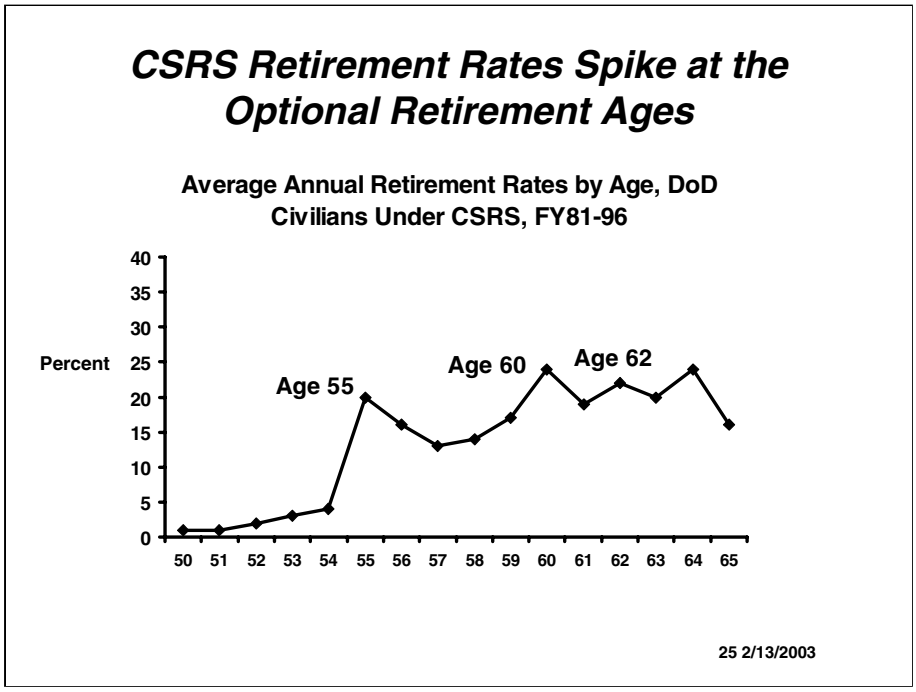
The columns on the right side show the average financial incentive to retire when we include both CSRS pension wealth and current and future earnings in the calculation. In the absence of the retention allowance, the average incentive to retire among those eligible for optional retirement is negative, –$288,000 at age 55 and –$250,000 at age 62. If these individuals were offered the maximum amount of the retention allowance, the average incentive falls to –$457,800 at age 55 and to –$398,100 at age 62, a 60 percent decrease. Thus, the maximum effect on the average financial incentive to retire is to reduce that incentive by 60 percent.



This chart shows the findings for those DoD employees in our data set who would be eligible for early retirement, but not optional retirement, by virtue of their age and YOS. In other words, they are age 50 or older and have at least 20 YOS. In the absence of any buyout or early retirement incentive, we calculate that the average financial incentive to separate or retire at their current age is negative, –$266,000 at age 50 and –$81,500 at age 59. Offering a voluntary separation or buyout incentive is estimated to increase the incentive to retire by 9 percent at age 50 and by 31 percent at age 59, but the average CSRS incentive still remains very negative. This estimated effect is smaller than the effect estimated for those eligible for optional retirement (shown in the previous chart). The effect is smaller because a 50 year old who takes the buyout and resigns can only begin receipt of his or her CSRS annuity at age 62. Thus, offsetting the buyout's incentive to leave is the strong CSRS incentive to stay until the individual is eligible for optional retirement. In contrast, the buyout's incentive to leave simply reinforces the CSRS incentive to retire among those already eligible for optional retirement.

We estimate that the average financial incentive to separate or retire increases substantially when individuals are assumed to get an early retirement offer. At age 50, we estimate that the average financial incentive to retire nearly doubles, increasing to –$9,700. At age 59, the average incentive becomes positive, increasing to $7,600.

The National Defense Authorization Act of 2002 authorized DoD to offer buyout incentives in addition to early retirement. The column on the far right shows our estimate of the average incentive to retire immediately among those offered both the buyout incentive and early retirement. The average incentive increases to $14,600 at age 50 and to $32,500 at age 59. Thus, we find that the incentive to leave more than doubles when both benefits are offered.

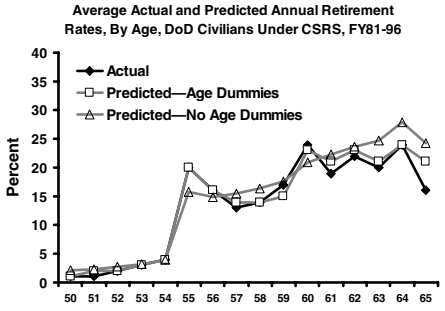


The next part of the presentation focuses on average retirement behavior by age and the estimated effect of the different workforce-shaping incentive programs on retirement behavior. This chart shows the retirement rate by age, pooling all DoD employees in all years in our data set. The fraction of individuals retiring under CSRS spikes at age 55, age 60, and age 62. These ages are the optional and deferred retirement ages under CSRS.

Predicting Effects of Workforce-Shaping Policies on Retirement Behavior Involved Two Steps

Step 1:
Estimate logit regression model of the effect of CSRS incentives on the probability of individual retirement

- **CSRS incentive variable = difference in the value of retiring today and the expected maximum future value**
- **Model includes variables for individual demographic and job characteristics and fiscal year**



Predictions made at mean values of job and individual characteristics

Model Predictions Closely Track Actual Retirement Rates

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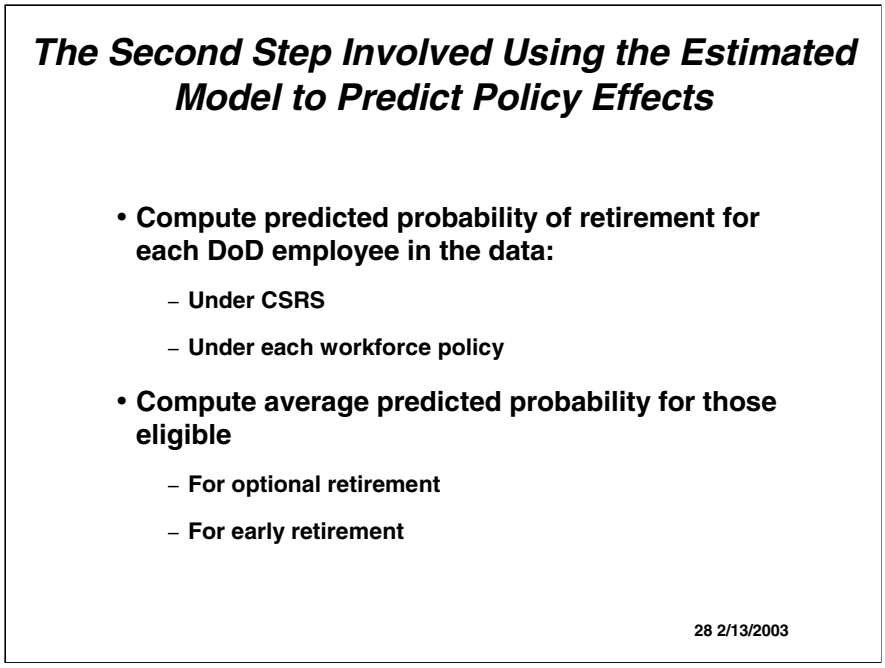
To predict the effects of workforce-shaping policies on CSRS retirements, we first estimate regression models of the probability that an individual retires in a given year as a function of the retirement incentive variable and a set of variables that control for the individual's demographic and job characteristics, as described in our companion paper (Asch, Haider, and Zissimopoulos, 2002). Unlike the first part of the analysis, the retirement incentive variable used in the regression analysis is specified as the utility of continued work in the civil service relative to the utility of retiring today. The value of continued work includes both current and future earnings as well as future retirement earnings and the value of future leisure. We follow Stock and Wise (1990) where the form of the utility function is the constant relative risk aversion, with a risk aversion parameter g, and rate of time preference b, and an additional parameter k to allow for differences in the value of income flows while the individual is working and retired. The model is estimated as a logit model. In the companion paper, we present results of estimating both a structural and reduced-form version of this model and discuss estimation issues that arise. The results presented in this briefing are based on the results of the reduced-form Stock-Wise option value model. In this version of the model, the values of b, g, and k are assumed based on results of previous studies. As discussed in our companion paper, the estimated effect of the CSRS incentive variable is not highly sensitive to alternative assumptions of b, g, and k.

The regression analysis yields estimates of the effects of the retirement incentive variable and the other variables in the model on the probability of retiring. We estimate an elasticity for the incentive variable of about 0.5. A

10 percent increase in the incentive variable is estimated to increase the average retirement probability from 0.08 to 0.084, a 5 percent increase. This elasticity is quite similar to other retirement elasticity estimates (Samwick, 1998) and to estimated elasticities of federal civil service retention with respect to relative civil service pay (Black et al., 1990). For example, Black et al. estimate a pay elasticity of 0.4 among administrative civil service workers. As a side note, we compute the incentive variable differently in the descriptive analysis than in the regression analysis because the dollar units in which we measure the variable in the descriptive analysis are easier to understand than the utility units (utils) we use in the regression analysis. Although the units differ in each analysis, the age patterns of the incentive variables are the same, regardless of whether the incentive variable is measured in dollars or utils. The regression model also includes variables to control for fiscal year and observed individual demographic and job characteristics including age, gender, occupation, geographic location, and DoD agency.

The fit of our model is quite good. The diagram in the chart shows the predicted retirement rates at each age using two different models and the actual retirement rates at each age. The predictions are made at the mean values of the explanatory variations. One model includes dummy variables representing the employee's age and the other model excludes the age dummies. When the age dummies are included, the model predicts actual retirement rates nearly perfectly. The good fit is not surprising because the age dummy variables capture factors that vary with age, such as health status, but are not included as explanatory variables in our model. The model that excludes the age dummies shows how well the incentive variable explains actual age variations in retirement. Even when we exclude the age dummies from the regression model, the model fit is still fairly good. In what follows, we use the model with the age dummies. Since our predictions are presented by age and our model is a reduced-form specification, we used the reduced-form specification with the age variable to arrive at the predictions shown in the next charts. The issue of model specification, the use of age dummies, and the choice of a reduced form (used here) over the structural approach is discussed in our companion paper. That paper also presents and discusses the coefficient estimates of all of the variables in the model.



In the second step, we predicted the probability of retirement for each individual in our data under the base case, with no workforce-shaping policies, and under the assumption that the individual was offered three different programs: the buyout, the maximum retention allowance, and—for those who would be eligible—the early retirement benefit. We then computed the average predictions for those eligible for optional retirement and for those eligible for early retirement benefits.

Findings on the Effects of Policies on Retirement...

Predicted Optional Retirement Rates

	CSRS	CSRS with: Buyout	CSRS with: Retention Allowance
Age 55			
Retirement Rate	**31.2%**	**37.3%**	**25.0%**
% Change		**20%**	**–20%**
Age 62			
Retirement Rate	**21.5%**	**26.3%**	**17.5%**
% Change		**22%**	**–19%**

Predictions based on estimated regression model, which holds demographic and job characteristics constant

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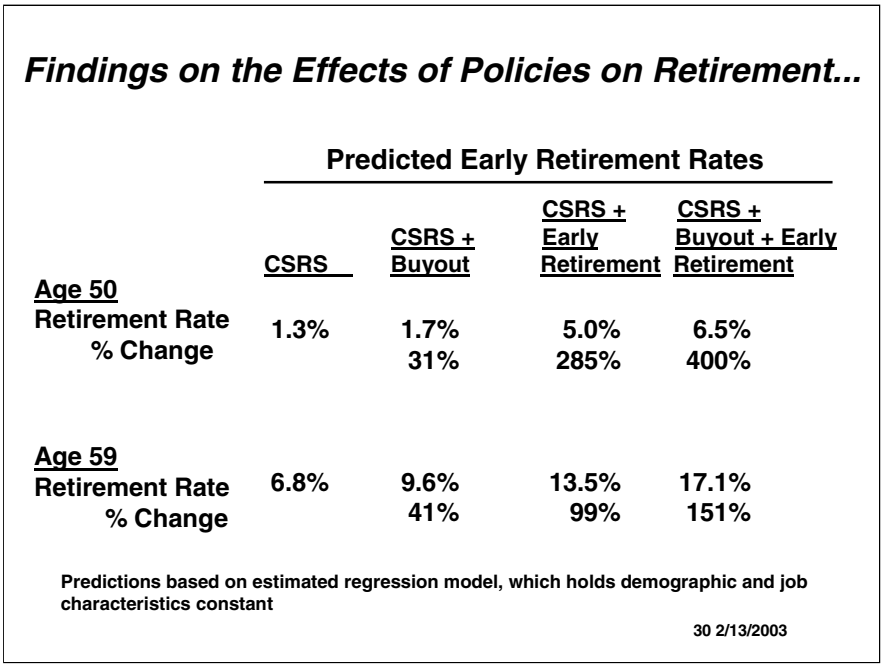
The chart above summarizes the findings for those eligible for optional retirement. As expected, the buyout program increases and the retention allowance reduces the average probability of retirement.

For those age 55 and eligible for optional retirement, the model predicts an average retirement probability of 31.2 percent. Offering the voluntary buyout increases the average predicted probability by 20 percent to 37.3 percent. The average predicted retirement probability at age 62 is 21.5 percent. The buyout increases the average predicted probability by 22 percent to 26.3 percent.

The maximum retention allowance reduces the average predicted retirement probabilities by 19 to 20 percent, depending on age.



This chart shows the results for those eligible for early, but not optional, retirement benefits. The average predicted probability of retirement at age 50 in the absence of the workforce-shaping programs is quite low, 1.3 percent. It is also relatively low at age 59, 6.8 percent. The buyout increases the average predicted probability by about a third to 1.7 percent for those age 50, and by about 40 percent to 9.6 percent for those age 59.

When individuals are assumed to be offered early retirement,we find a substantial increase in the average probability. The average predicted probability increases to 5.0 percent—an almost quadrupling of the retirement rate—at age 50, and increases to 13.5 percent—a doubling of the rate—at age 59. Offering both the buyout and the early retirement program increases the average predicted probabilities even more.

Conclusions

- **Buyouts are estimated to have sizable effects on incentive to retire and on predicted retirement rates among those eligible for optional retirement**
- **Effects of buyouts are more modest among those eligible for early retirement**
- **The maximum retention allowance reduces by 60% the estimated incentive to retire and by 20% the predicted retirement rate among those eligible for optional retirement**
- **Early retirement benefits have large estimated effects on the incentive to retire early and on predicted early retirement rates**
- **Use of these programs as workforce-shaping tools has been limited**

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In summary, we find that retention allowances, early retirement, and the special buyout are predicted to have sizable effects on retirement rates among those covered by CSRS. The early retirement incentive is estimated to have a particularly large effect on the early retirement rates. Our study did not consider the cost of offering these incentives. Consequently, we cannot draw any conclusions about which tool is the most efficient or cost-effective, and we leave it to future studies to make these computations.

Although our estimates indicate that these incentives can have large effects, these tools have not been extensively used, beyond their use during the drawdown in the 1990s.

Our results suggest that expanded use of these policies could be helpful in DoD's effort to address the large number of retirements expected over the next decade while shaping the skill and experience mix of its workforce to better achieve its future missions.

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