

This chapter summarizes our simulation results. We first discuss which system is more generous in terms of providing greater ACOL values or expected net lifetime wealth, FERS or CSRS, at each leaving age. We then present our results regarding the retirement incentives and separation incentives embedded in each system. Next, we discuss the incentives to switch to FERS from CSRS. We conclude the chapter with a summary of the results of our sensitivity analysis. We conducted a sensitivity analysis to examine how our main simulation results would change if we varied the assumptions listed in Table 2.1 and Figure 2.4.

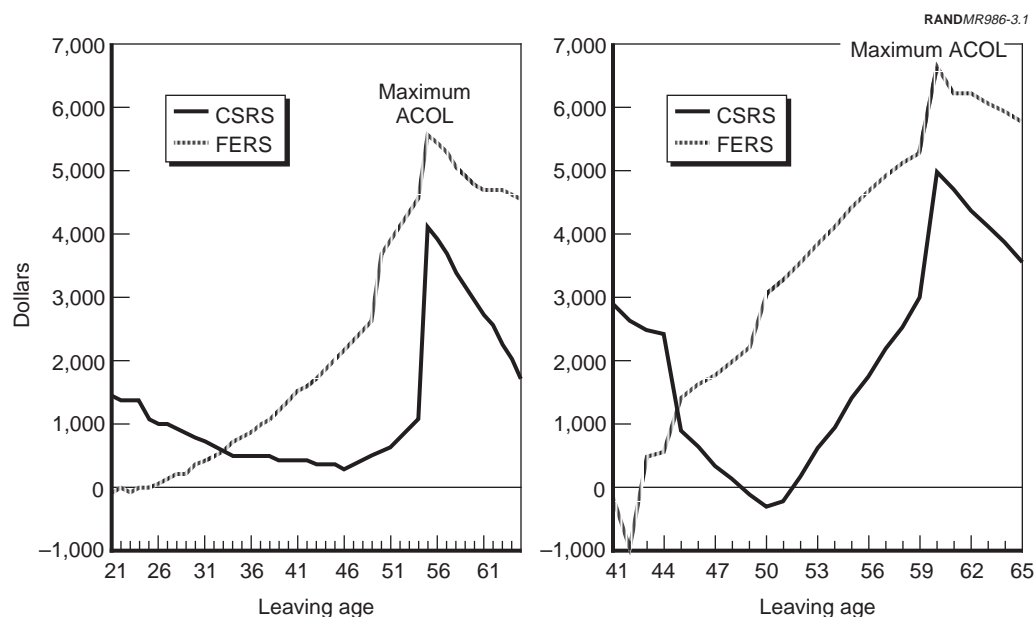
### **RELATIVE GENEROSITY**

To determine under which retirement system the individual's expected net lifetime wealth is greater, we use our simulation approach to compare the expected ACOL values under FERS with those under CSRS at each possible leaving age.<sup>1</sup> Figure 3.1a shows the results for someone who enters at age 20, and Figure 3.1b shows the results for someone who enters at age 40. In both cases, the path of expected ACOL values under FERS lies above the path for CSRS for most leaving ages beyond the vesting point.<sup>2</sup> In other words, we find that net expected lifetime earnings and retirement wealth is greater for individuals covered by FERS. This result cannot be attributed to the enormous growth in stock market returns in recent years and the implied beneficial effect on TSP returns. As discussed in Chapter Two, we assume a conservative 6 percent real growth rate in TSP returns, a rate that is far below the real returns actually experienced in the stock market in recent years. Rather, net expected wealth is greater under FERS because of a combination of factors, including providing an average long-term rate of return on the TSP that tends to protect the fund accumulation from the erosive effects of inflation, Social Security coverage, and the lack of a Social Security windfall elimination provision for those covered by FERS.

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<sup>1</sup>Personnel covered by CSRS are allowed to contribute to the TSP, but unlike those covered by FERS, their contributions are not matched by the employing agency. In a similar fashion, those covered by FERS can contribute to an Individual Retirement Account or Roth Individual Retirement Account, but their contributions are not matched by the employing agency. Our comparisons of FERS and CSRS do not include possible contributions to other retirement vehicles such as these or possible coverage by private-sector pension plans.

<sup>2</sup>The simulations account for the differing vesting points under the FERS basic plan and the TSP. (See Appendix A for a description of these components of FERS.)



**Figure 3.1a—Annualized Cost of Leaving Under Both Systems, Entry Age = 20**

**Figure 3.1b—Annualized Cost of Leaving Under Both Systems, Entry Age = 40**

As discussed in Chapter Two, the decision rule for determining the expected optimal retirement age-YOS combination is to retire when the employee's expected ACOL is maximized. For someone entering at age 20, the simulation model predicts that the expected optimum is at age 55 with 35 YOS under both systems. For someone entering at age 40, the model predicts an optimum at age 60 with 20 YOS under both systems. As shown in each figure, we find that the maximum expected ACOL value is greater under FERS at the optimal retirement age-YOS combination. Therefore, those who retire under FERS at the optimal point will be better off financially on average, and this is especially true for late entrants—i.e., the gap between the maximum expected ACOL under FERS versus that under CSRS is greater for those who enter at age 40 than for those who enter at age 20.

The reason why FERS is even more generous for late entrants is that these individuals were employed in their earlier careers in covered employment and have a fairly sizable Social Security benefit accumulated. Given our assumption that individuals enter the labor market at age 20, those who enter the civil service at age 40 have 20 years of earlier covered employment. But because of the Social Security windfall elimination provision for those covered by CSRS, their accumulated Social Security retirement benefit is reduced significantly. The Social Security windfall elimination provision does not apply to those covered by FERS. Consequently, for someone who entered at a late age, expected net lifetime earnings and retirement wealth including Social Security is substantially lower under CSRS relative to that under FERS. Since those who enter civil service at age 20 do not have any accumulated Social Security benefits from their early careers, the Social Security windfall elimination provision for the early years does not affect their FERS-CSRS comparison.

That FERS is found to be more generous should alleviate concerns expressed by some that benefits under FERS would be smaller than those under CSRS. In addition, the greater benefits might compensate civil service personnel for the risk that their fund accumulations, or the returns on the accumulation, might fall when interest rates or the stock market falls.

## RETIREMENT AGE-YOS INCENTIVES

To determine at which age-YOS combinations under FERS and CSRS individuals have an incentive to retire, the simulation model first computes the expected ACOL at each possible leaving age relative to leaving after the entry age. It then finds the age and YOS at which the expected ACOL is maximized. We conduct these simulations for different entry ages to determine whether FERS and CSRS embed different incentives for individuals with different career lengths. The simulation results are given in Table 3.1, which shows the expected optimal age and YOS of retirement under FERS and CSRS for different ages of entry into the civil service.

Holding entry age constant, we find that FERS and CSRS have identical retirement age-YOS incentives embedded in them regardless of career length, given our assumption of a minimum retirement age of 55 under FERS. For example, for those who enter the civil service at age 20, the incentive to retire is at age 55 with 35 YOS under both CSRS and FERS. For someone who entered at age 35, the incentive is to retire at age 60 with 25 years of service under both systems. This similarity in retirement age-YOS incentives is notable because, contrary to one of the initial intents of FERS, FERS and CSRS do not embed different optimal retirement incentives. However, as will be discussed in the context of our sensitivity analysis, when we assume a minimum retirement age of 57, the MRA for those who were born after 1970, we find that optimal retirement age for those who enter the civil service at age 20 under FERS is 57 rather than 55. In other words, retirement ages under FERS will automatically evolve to be older because of the rise in the MRA. Therefore, among recent entrants, FERS will successfully delay retirement to older ages relative to CSRS for those who enter the civil service at age 20 or 25.

One hypothesis regarding FERS was that it induces senior personnel such as managers to postpone retirement until later ages. The pay profile and TSP contribution rate assumptions underlying the results in Table 3.1 are for a median worker. Presumably, managers earn more than the median worker and contribute to the TSP at higher rates. To investigate whether we continued to find identical retirement age-YOS incentives embedded in FERS and CSRS for senior personnel, we reran our simulations assuming a significantly higher and steeper real pay profile and higher contribution rates. Specifically, we assume the individual begins employment at age 25 at \$40,000 and that his or her pay grows to \$95,000 in real dollars by the end of the career. The contribution rates we assume continue to vary by age but are about 40 percent higher than the ones we assume in the base case. For example, for individuals age 40 or older, we assume they contribute 6.4 percent of their earnings to the TSP instead of 4.5 percent, as in the base case. When we redo the analysis with these new assumptions, we find the same results as in Table 3.1. That is, we continue to find

**Table 3.1**  
**Expected Optimal Retirement Age and Years of Service,**  
**by Entry Age**

Entry Age	FERS		CSRS	
	Age	YOS	Age	YOS
20	55	35	55	35
25	55	30	55	30
30	60	30	60	30
35	60	25	60	25
40	60	20	60	20

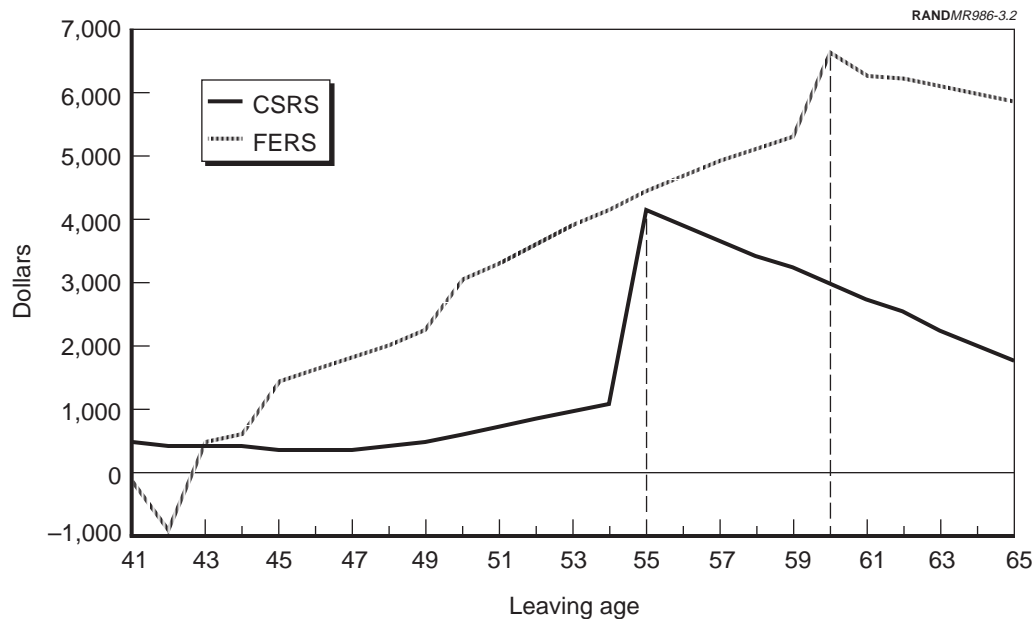
that the optimal age-YOS combination for retirement is the same under FERS and under CSRS for individuals who earn more, have steeper pay growth over their careers, and who contribute more to the TSP, given our assumption of an MRA of 55. As before, when the MRA is assumed to be 57, then the optimal retirement age for those who enter at age 20 or 25 is 57 under FERS but 55 under CSRS.

The result that the optimal retirement age-YOS combination is the same under FERS and CSRS also depends crucially on holding entry age or YOS constant in making the comparisons. If this assumption is violated, we find that the retirement age-YOS incentives will differ under the two systems, as shown in Figure 3.2. Suppose we let entry age vary in our comparison of CSRS and FERS. For example, suppose one individual entered at age 40 and was covered by FERS and another individual entered at age 20 and was covered by CSRS. If we compare the maximum expected ACOL values for these individuals, we see that the individual covered by FERS has an incentive to stay longer and retire at age 62, whereas the individual covered by CSRS has an incentive to retire earlier, at age 55.

The reason for the difference in retirement age-YOS incentives is that the two individuals have different years of service at each age. For example, a 50-year-old under FERS has only 10 YOS. A 50-year-old under CSRS has 30 YOS. The 50-year-old under FERS would not even be eligible to retire at age 55 with immediate benefits, unlike the 50-year-old under CSRS. He can retire only as early as age 60, when he has 20 YOS. This example shows the importance of holding YOS, or entry age, constant in comparing retirement age incentives.

This point is important because it helps explain observed differences in retirement ages of those under FERS and under CSRS. Empirically, the average age of retirement is older under FERS, and those under FERS have lower retirement rates (see Chapter Five). The simulation analysis indicates that these differences are not due to different retirement age incentives embedded in these systems. Rather, these comparisons fail to hold YOS constant. Since FERS was only recently implemented, those who retire under FERS tend to have fewer YOS. As shown in Figure 3.2, those with fewer YOS have an incentive to retire later under FERS.

The expected retirement age-YOS incentives discussed so far indicate the age-YOS combination at which an individual at the beginning of his or her career would expect to retire in the future. However, because of nonmonetary or random factors, such as ill health or relatively unpleasant job duties, some individuals will find that



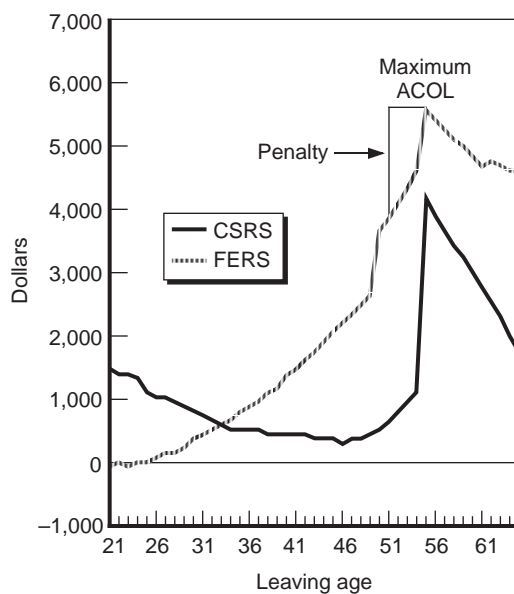
**Figure 3.2—ACOL When Entry Age = 20 for CSRS and Entry Age = 40 for FERS**

they are better off retiring before, or after, the expected optimal retirement age-YOS combination.

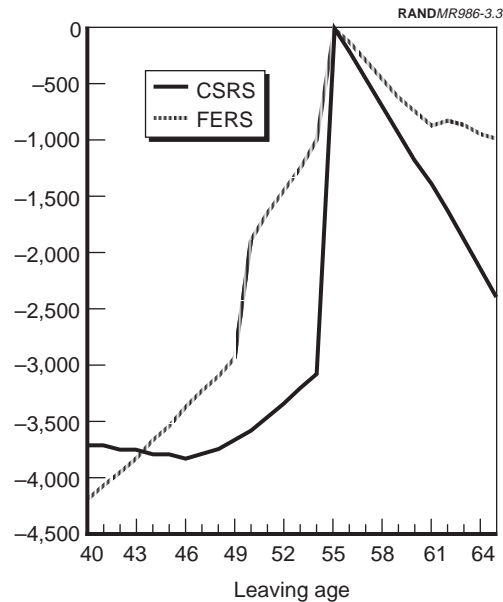
Although it might make sense to retire earlier or later than the optimal retirement age-YOS combination because of nonmonetary factors, those who do will suffer a financial penalty. The financial penalty at each leaving age equals the difference between the expected ACOL at that leaving age and the maximum expected ACOL. At the optimal retirement age-YOS combination, the penalty is zero. Figure 3.3a illustrates the penalty calculation for someone who leaves at age 50 when the maximum ACOL is achieved at age 55. Figure 3.3b graphs the penalty for all leaving or retirement ages beyond age 40.

As Figure 3.3b shows, the simulation model predicts that the penalty for leaving earlier or later than the expected optimal age-YOS combination is lower under FERS. That is, those who leave before the expected optimal retirement age are not as strongly penalized under FERS. Neither are those who retire later than the optimal. Consequently, FERS is predicted to produce more variance in retirement ages than is CSRS, but the average retirement age is predicted to be the same under both systems when the MRA is 55 under FERS. While the penalty for deferring retirement beyond the optimal age-YOS combination is lower under FERS for senior personnel, it is also lower for those who retire earlier. Therefore, this aspect of FERS is not consistent with a prevailing hypothesis regarding FERS.

The penalty is lower under FERS because the path of expected ACOL values ramps up and ramps down more gradually than the one for CSRS. The ramp up is more grad-



**Figure 3.3a—ACOL When Entry Age = 20,  
Under Both Systems**



**Figure 3.3b—Penalty from Deviating from  
Optimal Horizon When Entry Age = 20**

ual because of differences in the degree of inflation protection under the two systems and because of differences in the age at which individuals can claim a deferred retirement benefit. Those covered by FERS can claim a deferred annuity as early as age 55. In other words, those who leave before they are eligible for normal retirement, say at age 40, can still claim a FERS retirement benefit at age 55 if they have at least 10 YOS. As the individual ages, the deferred retirement age shifts under FERS. For example, for someone who enters the civil service at age 20, the deferred retirement age shifts from age 62 to age 55 when the individual becomes 30 years old and has 10 YOS. Also, the TSP provides a measure of inflation protection for those who leave before the normal retirement age because those who leave can roll over their TSP into an Individual Retirement Account and continue to earn an average rate of return that tends to protect their fund from inflation.

Under CSRS, a deferred annuity can be claimed only at age 62. The expected ACOL rises dramatically at age 55 under CSRS because once the individual becomes eligible for normal retirement benefits, the discounting of the retirement benefit shifts from age 62 to age 55, and the payout of benefits is for a longer period. Also, the retirement annuity for which the employee is eligible is not inflation protected if he or she leaves prior to being eligible for normal retirement. Both of these factors lower the expected ACOL under CSRS for every leaving age prior to age 55, as shown in Figure 3.3a.

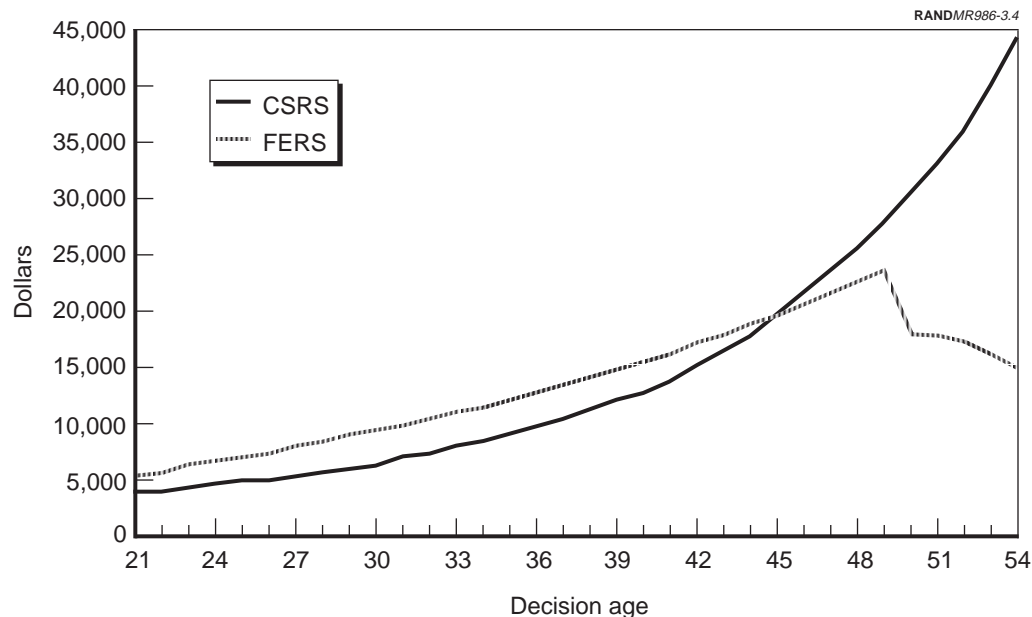
Beyond the optimal retirement age, the expected ACOL also falls more gradually under FERS. Deferring retirement beyond the optimal age results in a smaller expected ACOL because the annuity is paid out for a shorter period of time. However, the expected ACOL is larger because the employee's retirement annuity increases with

earnings and YOS. The size of the penalty associated with deferring retirement beyond the optimal age depends on the relative size of these factors. For someone who enters the civil service at age 20, pay growth beyond age 55 is generally quite small. Therefore, the growth in the retirement annuity for those covered by CSRS and FERS is also generally quite small. However, FERS has an extra advantage for those who defer retirement. They get another year's worth of contributions (including government matching contributions) to their TSP fund. As a result, the gain to deferring retirement is higher under FERS, implying that the overall net penalty from doing so is lower.

## SEPARATION INCENTIVES

Another hypothesis regarding FERS was that it provides stronger incentives to leave among mid- and late-career personnel. As discussed in Chapter Two, to determine whether separation incentives are stronger or weaker under FERS compared with those under CSRS, we simulate the maximum expected ACOL values at each decision age under each system. The system that has higher maximum expected ACOL values at each decision age has weaker separation incentives and the stronger stay incentives.

The results of our simulations for an individual who enters at age 20 are shown in Figure 3.4. The path of maximized expected ACOL values for FERS crosses the path for CSRS. For those in early and mid-career, the FERS path is somewhat higher than the CSRS path is. For those in late career, the FERS path is lower. Consequently, the net gain to staying (or the cost of leaving) is somewhat greater under FERS in the



**Figure 3.4—Maximum Expected ACOL by Decision Age When Entry Age = 20**

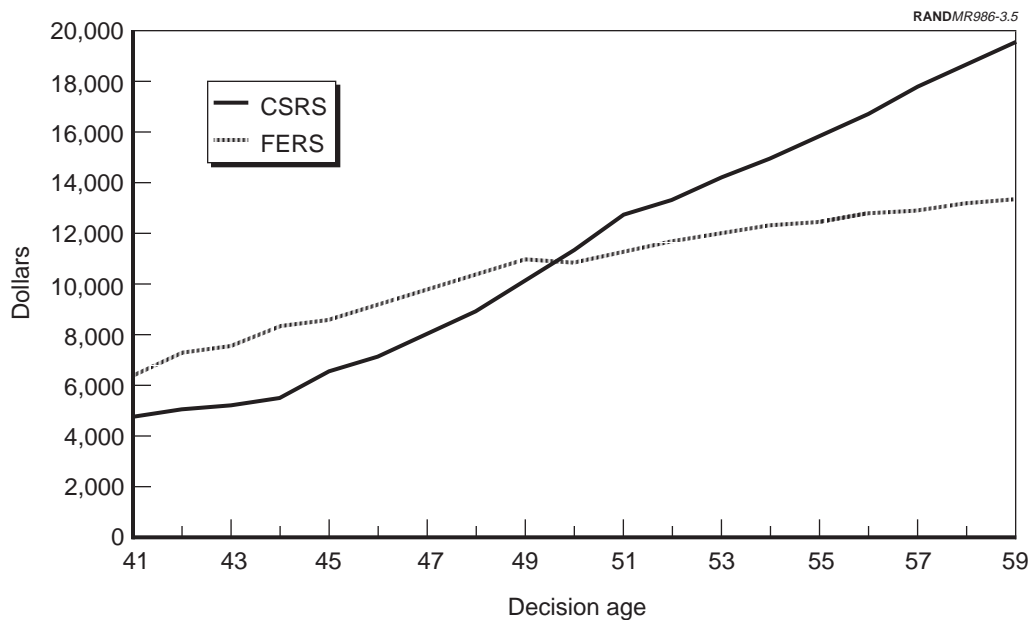
early and mid-career years, but smaller in the later years. In other words, we find that stay incentives are stronger under FERS in the early and mid-career but weaker in the late-career years. We find similar results for older entrants (see Figure 3.5).

The implication of this result is that, all else equal, we would expect turnover rates for mid-career personnel to be somewhat lower under FERS but higher for those nearing retirement age. This result is partially but not entirely consistent with the intent of FERS.

The main reason why turnover incentives are weaker under FERS for early and mid-careerists is that FERS is a more generous retirement system. Consequently, an individual has more to lose by not staying and accumulating an even larger benefit under this system. Although individuals who separate can continue to earn an inflation-protected rate of return on their TSP accumulations, the net value of staying in the civil service and continuing to make contributions to the fund make it more worthwhile to stay in the civil service than to leave.

To illustrate the role played by the relative generosity of FERS benefits in affecting the relative turnover incentives under FERS compared with those under CSRS, we arbitrarily redefined FERS to make it less generous and simulated the maximum expected ACOL values at each decision age under this redefined system. We then compared the new path of maximum expected ACOL values under FERS with the path for CSRS.

We could have chosen a variety of ways to make FERS a less generous system. For simplicity, we eliminated the Basic (defined benefit) Plan under FERS. Instead, we considered what would happen to the maximized ACOL values, and therefore to the



**Figure 3.5—Maximum Expected ACOL by Decision Age When Entry Age = 40**

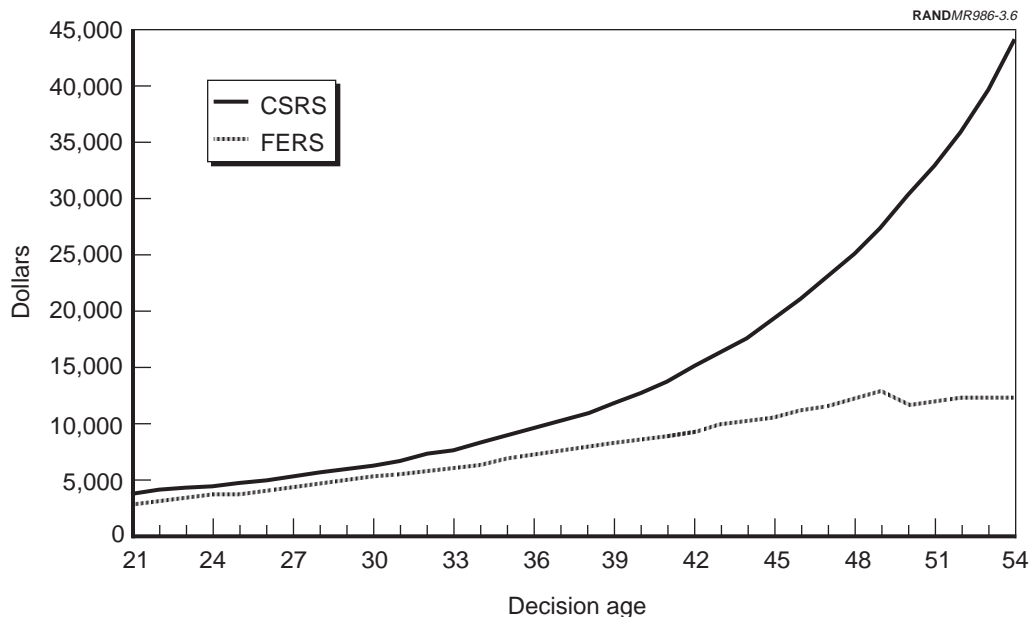


relative turnover incentives under FERS and CSRS, if FERS consisted of only Social Security and the Thrift Savings Plan. Eliminating the Basic Plan would obviously make the FERS retirement benefit less generous.

We find that when FERS is defined to be a less generous system, stay incentives in the early and mid-career are weaker under FERS than under CSRS, just the opposite of the earlier result.

We illustrate the path of maximum expected ACOL values under the redefined FERS and under CSRS in Figure 3.6 for someone who entered the civil service at age 20. The redefined FERS path now lies entirely below the CSRS path, indicating that separation incentives are uniformly stronger under FERS when FERS is redefined to be a less generous system.

In sum, we find that turnover incentives among junior and mid-career civil service personnel are actually weaker under FERS, contrary to earlier suggestions regarding the turnover incentives produced by FERS. If FERS offered less generous benefits, we find that turnover incentives would be stronger under FERS for these individuals. On the other hand, consistent with earlier suggestions, FERS turnover incentives are stronger for those nearing retirement. Past research (Asch and Warner, 1994) shows that greater turnover in the more senior grades provides promotion opportunities and effort incentives for those in the junior grades. Furthermore, greater turnover overall provides opportunities to rejuvenate the force. It is unclear whether the reduced turnover incentives of the mid-career force offsets the greater turnover incentives of the senior force to create more promotion opportunities for junior personnel.



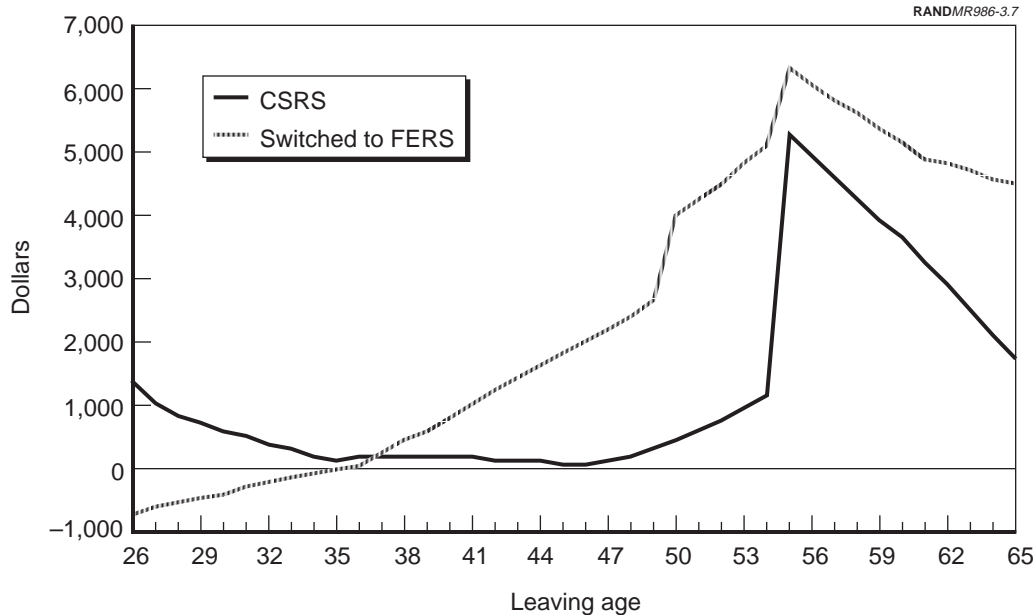
**Figure 3.6—Maximum Expected ACOL by Decision Age for FERS Without the Basic Plan  
When Entry Age = 20**

In Chapter Six, we compare separation rates under FERS and CSRS for mid-careerists to determine whether we can detect empirical differences in addition to theoretical ones.

### INCENTIVES TO SWITCH TO FERS

We also used our simulation model to examine the incentives to switch to FERS from CSRS, all else equal. We first simulate the expected ACOL values (ACOL(N,1)) for someone who spends an entire career under CSRS. We then compare these to the values for someone who is covered by CSRS until the switch age and then is covered by FERS thereafter. If the path of expected ACOL values is higher under the latter path, the individual's expected lifetime net earnings and retirement wealth at each leaving age is higher by switching to FERS. Of particular interest is the comparison of the maximum ACOL values. If the maximum expected ACOL value is higher, the individual's expected maximum net earnings and retirement wealth at the optimal retirement age-YOS combination will be higher if he or she switches to FERS. We conduct these simulations for different switch ages.<sup>3</sup>

The main result is that individuals who face the switch decision early in their careers are better off financially by switching to FERS, all else equal. The comparison of the path of expected ACOL values for young entrants (age 20) who face the switch decision when they have five years of service is shown in Figure 3.7. The path of expected ACOL values is uniformly higher beyond the FERS vesting point for those who switch



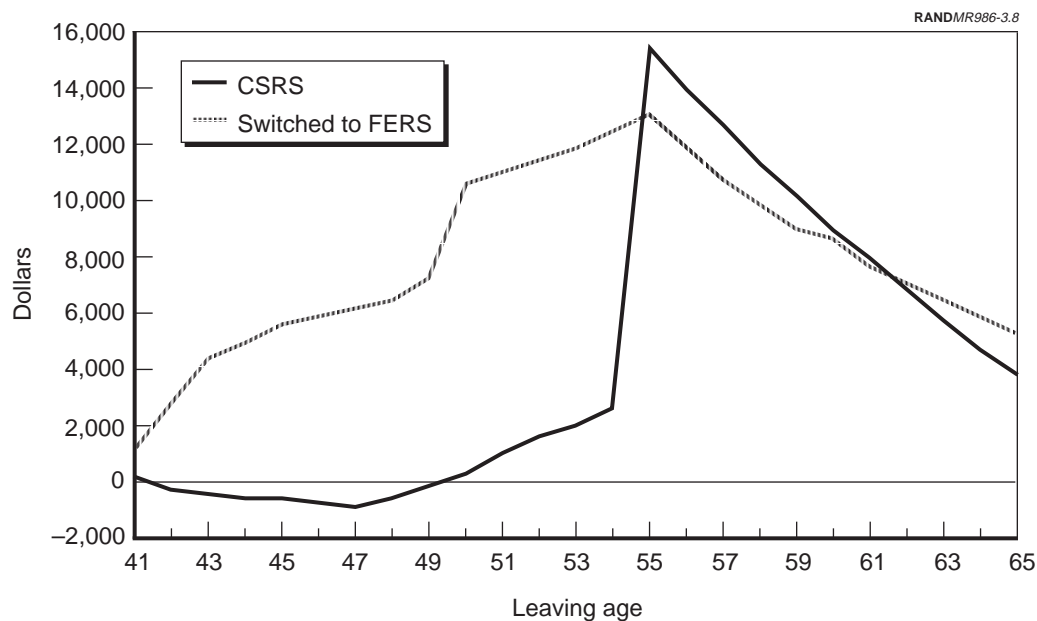
**Figure 3.7—ACOL When Entry Age = 20 and Switch Age = 25**

<sup>3</sup>We also conduct the simulations for different entry ages. Since the qualitative results are similar to those discussed in the text, the results of these simulations are not shown.

than for those who do not. Importantly, the expected maximum ACOL is higher for the individuals who switch. Consequently, expected lifetime net earnings and retirement wealth is higher at the optimal retirement point.

For individuals who face the switch decision later in their careers, the simulation model predicts that they are better off financially by remaining under CSRS if they expect to stay in the civil service until they retire. Figure 3.8 shows the path of expected ACOL values for individuals who enter the civil service at age 20 and face the switch decision at age 40. The paths cross over at age 55. At and beyond age 55 (until age 64), the expected ACOL values at each leaving age are higher for individuals who stay under CSRS than for those who switch to FERS. Individuals are predicted to maximize their expected net lifetime earnings and retirement wealth at age 55, the optimal retirement point, by staying under CSRS. They are better off by remaining under CSRS because those who start FERS later in their careers have fewer years in which to grow their TSP accumulations. In addition, CSRS retirement benefits increase with YOS in a nonlinear fashion because the multiplier in the benefits formula rises with YOS. As a result, individuals with more YOS under CSRS have more to lose by switching to FERS, all else equal.

However, before age 55, the expected ACOL values are higher for individuals who switch to FERS. The model predicts that those who do not expect to remain until the optimal retirement age, say because of nonmonetary factors, will be better off by



**Figure 3.8—ACOL When Entry Age = 20 and Switch Age = 40**

switching to FERS. Therefore, whether individuals facing the decision to switch to FERS in mid- and late career should switch depends on their career expectations.<sup>4</sup>

## SENSITIVITY ANALYSES

As discussed in Chapter Two, our simulation analyses are based on a series of assumptions. To determine how sensitive our results are to these assumptions, we conducted a variety of sensitivity analyses. The second column in Table 3.2 lists the assumptions we made in deriving the results we have presented so far. The third column indicates how we varied each assumption. Specifically, we examine how our results change when we assume, alternatively, a higher inflation rate, a higher minimum retirement age, a higher personnel discount rate, a higher TSP growth rate, a higher TSP employee contribution rate, and a higher and steeper pay profile. Since the Balanced Budget Act of 1997 increased employee contribution rates temporarily for CSRS and the FERS Basic Plan, we also examine how our results would change when the employee contribution rate is 7.5 percent under CSRS and 1.3 percent under the FERS Basic Plan.<sup>5</sup> Finally, we assume a somewhat different pay profile in the alternative sector than in the base case. The base case assumes that the individual will exit the labor force at age 65. That is, an individual who retires from the civil service at, say, age 55, is assumed to find a job for 10 years in the alternative sector in the base case. In the sensitivity analysis, we alter this assumption and assume that the individual who retires from the civil service also exits from the labor force. Using the example, the sensitivity analysis assumes that an individual who retires from the civil service at age 55 would also exit the labor force at age 55 and therefore would have zero earnings in the alternative sector for those 10 years.

The variations we make are somewhat arbitrary in some cases. We tried to choose assumptions that reasonably spanned the set of feasible alternatives. For example,

**Table 3.2**  
**Assumptions That We Varied**

Assumption	Base Case	Variations
Inflation rate	3 percent	6 percent
Minimum retirement age	age 55	age 57
Personal discount rate (PDR)	5 percent	10 percent
TSP average growth rate	6 percent	15 percent
TSP employee contribution rate	varies with age	5 percent for all ages
Pay profile	median	high
Contribution rates under CSRS, Basic Plan	7.0 percent, 0.8 percent	7.5 percent, 1.3 percent
Alternative pay profile	Exit at age 65	Exit at C.S. retirement age

NOTE: C.S. = civil service.

<sup>4</sup>Other factors may affect the decision to switch, such as expectations about future returns. Even individuals facing the switch decision early in their careers may not switch if they expect a low return, or even a loss, on their accumulations. Such expectations might explain why relatively few individuals switched during the open period in 1988, because it closely followed the stock market's "Black Monday" in October 1987. Nonetheless, the simulation model predicts, all else equal, that those facing the switch decision earlier in their careers are more likely to switch than those facing it later.

<sup>5</sup>This temporary change is discussed in Appendix A.

given the low rates of inflation experienced in recent years, an average rate of inflation between 3 percent and 6 percent seemed to span the range the employee might expect over an entire lifetime. We consider a minimum retirement age of 57 since this is the MRA that applies to those born after 1970, and therefore to most young entrants to the civil service in recent years. We consider a higher contribution rate to the TSP, equal to 5 percent, to reflect the growth in contribution rates in recent years. The alternative pay profile we consider is for someone who obtains more education and enters the civil service at a later age but at a higher level of pay and who experiences more wage growth than the individual in the base case. This higher pay profile is the same one we used to examine how retirement results would change for those in senior leadership positions, discussed earlier in this chapter.

We varied these assumptions individually. For example, when we ran the simulation model under the higher-pay profile assumption, we maintained the other assumptions. However, the assumptions are correlated. For example, available evidence indicates that those who earn more also contribute a higher fraction of their earnings to their TSP (see Thrift Savings Plan Board, 1997). In addition, those who earn more may earn a higher rate of return on their TSP fund because they have a greater incentive to learn about investment options. An alternative way to conduct the sensitivity analyses would be to vary the assumptions jointly. Because our sensitivity analysis does not do this, it provides only a partial view of how our results would change under alternative scenarios.

Table 3.3 summarizes the results of the sensitivity analyses. The first column lists the various assumptions. Columns (2) through (5) indicate the main results we found earlier and correspond to the titles of the earlier subsections. Column (2) refers to our earlier result that found that FERS is a relatively more generous system. Column (3) refers to our result that retirement age-YOS incentives are the same under CSRS and FERS. Column (4) refers to our result that separation incentives are somewhat weaker under FERS for those in their early and mid-careers. Column (5) refers to the result that those who face a switch decision early in their careers are better off financially if they switch to FERS. An “X” in one of the columns in Table 3.3 indicates that the main result found earlier was reversed or changed in some major way when the assumption was varied. If there is no “X” the quantitative results may still have changed, but the results were not reversed.

For example, when we assumed a higher rate of inflation, the expected ACOL values at each leaving age under FERS compared with those under CSRS changed. Nonetheless, we continued to find the same general results as before. Therefore, no “X” appears in the first row of Table 3.3. As another example, when we assume that individuals who retire from the civil service also exit the labor force, we find that the optimal retirement age is as late as possible. That is, we find that individuals always increase their lifetime wealth by working another year in the government. However, we find the same result under FERS and under CSRS, so our overall conclusions regarding our comparison of FERS and CSRS are the same in Table 3.3.

When we assume a higher minimum retirement age under FERS, we find that the optimal retirement age under FERS for young entrants became 57 instead of age 55,

**Table 3.3**  
**Results of Sensitivity Analyses**  
**(X indicates a change from the base case result)**

Assumption (1)	Relative Generosity (2)	Retirement Age Incentives (3)	Separation Incentives (4)	Incentives to Switch to FERS (5)
Inflation rate				
MRA		X		
PDR	X			X
TSP growth rate		X		
TSP contribution rate				X
Pay profile				X
TSP growth rate		X		
Contribution rate to CSRS, Basic Plan				
Alt. pay profile				

the optimal under CSRS. Therefore, recent (young) entrants to the civil service who are covered by FERS are predicted to retire at later ages than they would have retired had they been covered by CSRS instead.

When we assume a higher personal discount rate (PDR), we find that CSRS is the more generous system. The reason is that individuals contribute more of their earnings to FERS than they do to CSRS. These contributions are deducted from current pay. Although retirement benefits are also more generous under FERS, these benefits are not realized until later in the employee's lifetime.

When the discount rate is higher, the discounted present value of these future benefits are smaller. Consequently, FERS seems less generous.

Interestingly, we find only one major change in the results when we assume a significantly greater TSP rate of return. Individuals covered by FERS have an incentive to retire later than those covered by CSRS. The reason is that individuals who leave earlier forgo the opportunity to continue accumulating and receiving matching contributions to their TSP fund. We also find that most of the results are the same when we assume a higher pay profile. However, because we do not vary other assumptions, such as the TSP contribution rates, when we vary the pay assumption, these particular sensitivity results may not be realistic.