EARLY RETIREMENT PENSION BENEFITS

Jeremy I. Bulow

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ABSTRACT

Early retirement options alter the accrual of pension benefits,
increasing the fraction of total benefits accrued in the early years of
work. This is true regardless of whether de facto no worker exercises
the early retirement option. No currently used actuarial method correctly
calculates the cost of an early retirement option. Early retirement op-
tions must be considered in calculating age/compensation profiles. Further-
more, the early retirement option can effectively be used to encourage
less productive older workers to retire, without the firm having to reduce
the nominal salary of such workers.

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Introduction

An early retirement option can dramatically alter the economic accrual of pension benefits. Generally, accruals in the early years of a worker's career will be increased and accruals will be reduced.

No currently accepted accounting method correctly evaluates early retirement options. The reason is that methods in use estimate that an exogenous fraction of workers will opt for early retirement. Actually, a worker's decision about whether to stay with a firm will be endogenous to the early retirement benefits available--if a worker has an attractive termination option he will have to be compensated for not exercising that option. Thus, regardless of whether the option is exercised or not the effective benefit to the worker is the same.

This paper is divided into five sections. The first section lays out a model of a defined benefit pension plan without an early retirement provision. The second section adds such a provision to the plan. The third section provides a numerical example of the importance of an early retirement provision. Section four deals with the accounting for early retirement options. The fifth section discusses some implications of an early retirement option, particularly its utility as a means of reducing the compensation of less productive older workers without reducing their nominal compensation.

1. Pension Plans without Early Retirement Provisions

We begin by writing a formula for the accrual of pension benefits in a plan which does not have early retirement provisions. The plan considered is

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one where retirement benefits are a (separable) function of age, years of

service, and average salary over the last N years of service.

For notation let:

e = age at entry into the firm

t = current age

N = number of years over which salary average is calculated

T = normal retirement age

A(t) = value of an annuity paying \$1 per year for life starting

immediately to a person of age t

L(T, t) = probability of living to age T for a person currently

aged t

D(T, t) = value of \$1 certain at time T given it is now time t

V(t-e) = fraction of benefits that are vested afer t-e years of service

S(t) = salary received at age t

P(t) = value of accrued pension benefits at age t

α = constant

Accrued vested benefits at age t, P(t), can be written as

$$(1) \qquad P(t) = \alpha(t-e)\left[\int_{t-N}^{t} S(x)dx\right]A(T)L(T, t)D(T, t)V(t-e)$$

if benefits are linear in years of service. It is important to note that the

worker's claim at any given time is a specific nominal amount. That is,

even though workers' benefits are tied to salary one can calculate the

present value of the worker's claim at any moment based strictly on past

levels of salary. No projection of future salary increases are needed.

In future salary negotiations both the firm and worker will take into

account the effect of a salary increase on the worker's pension benefits.
Thus, those increases in benefits will be part of future compensation.

This line of reasoning argues for accrued benefit pension accounting
rather than projected benefit accounting (in accordance with Financial
Accounting Standards Board Statement No. 35). However, including only firms'
legally accrued obligations as pension benefits does not preclude implicit
contracts between the firm and its employees, as discussed by Lazear (1979).
For a detailed discussion of this general point see Bulow (1979).

In equation (1) benefits are calculated by multiplying a constant times
years of service times final salary over the last N years of service (the fact that
an average salary is taken is subsumed in the constant) and multiplying this annual
benefit by (a) A(T)--the annuity value if the worker were now at retirement age
and about to start receiving benefits; (b) L(T, t)--the probability of living
to receive benefits; (c) D(T, t)--the discount factor to allow for the fact
that benefits do not start for T-t years, and (d) the percentage of all
accrued benefits that are vested, V(t-e).

Were benefits not accumulated linearly in years of service the term
(t-e) would have to be replaced by a function g(t-e).

To find out how much in the way of benefits are accrued at a point in
time we find

$$
(2) \qquad \dot{P}(t) = \left[\frac{1}{t-e} + \frac{S(t) - S(t-N)}{\int_{t-N}^{t} S(x)dx} + \frac{\dot{L}}{L} + \frac{\dot{D}}{D} + \frac{\dot{V}}{V} \right] P(t).
$$

For simplicity we will assume that the plan immediately vests all workers
so that $V = 1$ and $\dot{V} = 0$.

Now (2) can be interpreted in the following way: the fractional increase
in accrued benefits is equal to the fractional increase in years of service $\left(\frac{1}{t-e}\right)$
plus the fractional increase in final average salary plus the increased chance
of living to receive a benefit plus the fractional increase in the value of benefits
to be received because we are closer to the day pension benefits begin.

Among the four reasons cited above for benefits increasing in value, two
are independent of whether the employee stays with the firm. $\dot{L}/L$ represents the
fact that the worker has lived a little longer and is thus more likely to ever
receive an annuity. $\dot{D}/D$ represents the fact that the day of receipt of the first
annuity payment has come closer, and thus already accrued benefits are more valuable.
$\dot{D}/D$ equals the riskless interest rate, which we can redefine as r. Thus the only
benefits which can be attributable to current compensation are the first two
terms

(3)
$$\left[\frac{1}{t-e} + \frac{S(t) - S(t-N)}{\int_{t-N}^{t} S(x)dx}\right] P(t).$$

The third term represents the actuarial gain to the worker from not
taking out life insurance on his benefits (which disappear in the event of
death) and still living, while the fourth term represents interest on previously
accrued benefits and is thus not attributable to current work.

For example, if a worker has been with a firm for ten years and his
salary has been rising exponentially at five percent per year, then by formula
(3) we know that the rate of pension benefit accrual attributable to current
service is equal to fifteen percent of previously accrued benefits—ten percent
because length of service is rising by ten percent per year and five percent
because final average compensation is rising by five percent per year. In total,

accrued benefits would be rising by fifteen percent plus the interest rate ($\dot{D}/D$ or r) earned on old benefits plus the actuarial gain from getting older ($\dot{L}/L$, or the chance of dying).

By substituting (1) into (3) and dividing by current salary, S(t), we can find currently accruing benefits as a fraction of salary. Because of the interest factor (benefits accrued at age 64 need be discounted much less than benefits accrued at age 34) this ratio becomes much larger as the worker gets older.

As a numerical example, consider a plan that pays a worker one percent of final salary times the number of years of service. The interest rate is eight percent. Pension accruals can be calculated as a function of age, experience, and salary growth rate. Table 1 calculates these accruals using PBGC mortality tables. The increase in benefits as a function of age and experience is rather marked: given the same experience and salary growth rate a worker's pension accrual will be at least 2.2 times higher for every 10 years older the worker is. A worker whose salary was growing at five percent per year would accrue benefits a third higher if he had twenty years experience than if he had ten, and two-thirds higher with 30 years experience than with ten.

TABLE 1

PENSION ACCRUALS AS PERCENT OF SALARY

Age, Experience	Salary Growth Rate		
	0%	5%	10%
40, 10	0.9	1.4	1.9
45, 10	1.4	2.1	2.8
45, 15	1.4	2.4	3.5
50, 10	2.1	3.1	4.2
50, 15	2.1	3.6	5.2
50, 20	2.1	4.2	6.2
55, 10	3.2	4.8	6.3
55, 15	3.2	5.6	7.9
55, 20	3.2	7.3	9.5
55, 25	3.2	7.1	11.1
60, 10	4.9	7.4	9.9
60, 15	4.9	8.7	12.4
60, 20	4.9	0/0	14.8
60, 25	4.9	11.1	17.3
60, 30	4.9	12.4	19.8
65, 10	8.0	12.0	16.0
65, 15	8.0	14.0	20.0
65, 20	8.0	16.0	24.0
65, 25	8.0	18.0	29.0
65, 30	8.0	20.0	32.0
65, 35	8.0	22.0	36.0

2. Pension Plans with Early Retirement Provisions

Now consider a pension plan with an early retirement provision. These provisions tend to be "better than actuarially fair." That is, absenting taxes and given good insurance and capital markets a person who retired early would tend to be better off taking an early retirement benefit rather than waiting to normal retirement age and taking full benefits. Exceptions to this decision rule would be caused by (1) the worker knowing his life expectancy is longer than that in the mortality tables, and (2) tax reasons, as discussed in Section 5.

We add to the previous section two pieces of notation:

$B(x)$ = fraction of normal retirement benefits received by

a worker who starts his pension at age x

R = minimum early retirement age.

For example, if the early retirement algorithm is that benefits are reduced by three percentage points per year for each year payments begin before age 65, then $B(65) = 1$ and $B(55) = .70$.

We make the assumption that the imputed return to delaying benefits decreases with the age benefits start. Thus an employee who terminates at or before some age R would decide to begin benefits at R (choosing the annuity with the highest market value among those available) and an employee who terminates after age R will begin benefits immediately. Sometimes R may be defined by a minimum age at which early retirement benefits can begin, with the employee maximizing the value of his pension annuity by beginning pension benefits as soon as possible after retirement.

In this case the value of a worker's benefits can be written as

(4a) $P(t) = \alpha(t-e)\left[\int_{t-N}^{t} S(x)dx\right] A(R)L(R, t)D(R, t)V(t-e)B(R)$

$$\text{if } t \leq R$$

(4b) $P(t) = \alpha(t-e)\left[\int_{t-N}^{t} S(x)dx\right] A(t)V(t-e)B(t)$

$$\text{if } T \geq t \geq R.$$

Equation (4a) calculates the value of a worker's benefits if he leaves the firm at or before age R and begins receiving benefits at R. Equation (4b) states the value of a worker's benefits if he leaves the firm between ages R and T and begins receiving benefits immediately. In general, this will be the optimal strategy for any employee who leaves a firm which has an early retirement plan, though theoretically it would be possible for a plan to be structured so that there would not be a unique crossover point before which early retirement was not profitable and after which it was.

Differentiating (4a) and (4b) yields the amount of benefit accruing at any point in time:

(5a) $\dot{P}(t) = \left[\dfrac{1}{t-e} + \dfrac{S(t) - S(t-N)}{\displaystyle\int_{t-N}^{t} S(x)dx} + \dfrac{\dot{L}}{L} + \dfrac{\dot{D}}{D} + \dfrac{\dot{V}}{V}\right]P(t)$

$$\text{if } t \leq R$$

(5b) $\dot{P}(t) = \left[\dfrac{1}{t-e} + \dfrac{S(t) - S(t-N)}{\displaystyle\int_{t-N}^{t} S(x)dx} + \dfrac{\dot{A}}{A} + \dfrac{\dot{V}}{V} + \dfrac{\dot{B}}{B}\right]P(t)$

$$\text{if } t \geq R.$$

As before, note that $\dot{D}/D$ equals the riskless interest rate r and assume for simplicity V = 1. Then if $t \leq R$ the rate of benefit accrual is

$$\dot{P}(t) = \left[\frac{1}{t-e} + \frac{S(t) - S(t-N)}{\displaystyle\int_{t-N}^{t} S(x)dx} + \frac{\dot{L}}{L} + r\right]P(t).$$

Of these terms the interest term, rP(t), accrues as interest on old benefits and thus is independent of current work experience. The term $\dot{L}/L$ P(t) is the actuarial gain due to living an extra period and being more likely to receive a pension. It is balanced by the potential for losing all previously accrued benefits (P(t)) by dying (an event with probability $\dot{L}/L$). Thus, the benefit accrual due to continued employment is

(6a)
$$\left[\frac{1}{t-e} + \frac{S(t) - S(t-N)}{\displaystyle\int_{t-N}^{t} S(x)dx}\right]P(t)$$

which is analytically as in the prior section. The difference is that with early retirement P(t) is the value of pension benefits if benefits begin at age R. Because we have assumed that the early retirement option is used because it is a good deal actuarially for the employee the value of P(t) is greater with early retirement. Consequently, the accrual rate in (6a) is also greater with early retirement.

If $t \geq R$ then we find the rate of benefit accrual

$$\dot{P}(t) = \left[\frac{1}{t-e} + \frac{S(t) - S(t-N)}{\displaystyle\int_{t-N}^{t} S(x)dx} + \frac{\dot{A}}{A} + \frac{\dot{B}}{B}\right]P(t).$$

However, after adjusting for the interest that would have been
accumulated on old benefits and the actuarial gain from living, the net
benefit to continued employment can be written as

$$(6b) \qquad \left[\frac{1}{t-e} + \frac{S(t) - S(t-N)}{\int_{t-N}^{t} S(x)dx} + \frac{\dot{B}}{B} + \frac{\dot{A}}{A} - r\right]P(t).$$

Benefits increase due to increased employment, an increased salary base, and
(through retirement postponement) by being eligible for a higher fraction of
maximal benefits. Benefits decrease because an annuity starting at an older
age is worth less ($\dot{A}/A$ is negative) and interest on previously earned benefits
must not be attributed to current earnings. That is, the gain to working is
equal to percentage increase in benefits due to more service, increased salary
base, and an increased ratio of benefits received to normal retirement benefits.
The loss from working is due to receiving an annuity with less value due to
(1) commencement at an older age (as reflected in the negative $\dot{A}/A$ term) and
(2) the loss of a year's interest in waiting for the annuity to begin (as
reflected in the -r term).

Term (6b) gives the rate of benefit accrual after one reaches age R.
Relative to there being no early retirement plan accruals can be either higher
or lower at ages close to R, but as the employee reaches an age closer to the
normal retirement age T benefit accruals must be lower in the presence of an
early retirement option.

Early on benefits may have limited value except for the presence of an
early retirement option. Thus, while the percentage rate of increase in benefits

will necessarily be lower after age R with early retirement this factor can

be swayed by the base on which benefits are increased (P(R)) being much larger

given the possibility of taking immediate benefits. [$\dot{B}/B + \dot{A}/A - r < 0$ by

the assumption that early retirement is better than actuarially fair, so (6b)

is larger than (6a) or (3) except that P(t) may be larger in the early retire-

ment case being analyzed in (6b).]

At normal retirement total cumulated benefits are the same regardless

of whether there was an early retirement option. Since more accrued benefits

are accrued early on when there is an early retirement option, more benefits

are necessarily being accrued in the later years when no such option exists.

The reason for the smaller accrual in later years is that in deciding to work

and postpone benefits the employee is making a sacrifice in not taking advantage

of an actuarially beneficial early retirement plan. Thus less of the accrual

of normal pension benefits can be properly attributed to current service. As

will be shown later on, it is very possible that continued work may imply

negative pension benefit accruals.

3. Numerical Example of the Effect of an
    Early Retirement Option on Pension
    Benefit Accruals

Table 2 provides an example of the effect of an early retirement option

on the accrual of pension benefits. The plan is assumed to provide benefits

equal to one percent of final salary times the number of years worked, with

benefits beginning at age 65. Accrued benefits are calculated assuming that

benefits may begin any time between ages 55 and 65, with benefits reduced by

three percentage points for each year prior to age 65 that retirement occurs.

That is, if a worker retired at age 58 with 20 years of service he would receive

TABLE 2

PENSION ACCRUAL WITH EARLY RETIREMENT

Age, Experience	Salary Growth Rate		
	0%	5%	10%
40, 10	1.7	2.6	3.4
45, 10	2.6	3.8	5.1
45, 15	2.6	4.5	6.4
50, 10	4.2	6.3	8.4
50, 15	4.2	7.3	10.5
50, 20	4.2	8.4	12.6
55-, 10	6.9	10.3	13.7
55+, 10	2.8	6.2	9.7
55-, 15	6.9	12.0	17.2
55+, 15	0.8	5.9	11.1
55-, 20	6.9	13.7	21.6
55+, 20	-1.3	5.6	12.5
55-, 25	6.9	15.4	24.0
55+, 25	-3.3	5.3	13.9
60, 10	1.8	5.6	9.4
60, 15	-1.1	4.6	10.3
60, 20	-4.0	3.6	11.2
60, 25	-6.9	2.6	12.1
60, 30	-9.8	1.6	13.0
65, 10	0.4	4.4	8.4
65, 15	-3.4	2.6	9.6
65, 20	-7.2	0.8	8.8
65, 25	-11.0	-1.0	9.0
65, 30	-14.8	-2.8	9.2
65, 35	-18.6	-4.6	9.4

an immediate annuity of 15.8 percent of his final salary, or 20 x (1 - .03(65 - 58)

percent of salary.

Benefits as a fraction of salary rise continuously until the worker

approaches his 55th birthday (the lines on the table where age is listed as 55-).

Immediately upon the 55th birthday there is a discrete drop in the benefit

accrual rate (see the lines labeled 55+). This fall is because upon the 55th

birthday there is an increased opportunity cost to staying with the firm: an

actuarially advantageous early retirement option must not be exercised for the

employee to continue to work. Until the 55th birthday there is no such cost. After the 55th birthday this cost comes into play, becoming greater and greater until the 65th birthday. However, as a worker becomes older the benefits accrued under a normal retirement plan also become larger each year.

If an employee has a high rate of salary growth this increase in benefit accruals is particularly large. Thus, in the example in Table 2, workers with salary rising at ten percent a year who started with the firm at age 40 or later actually find their accruals as a percentage of salary rising for a while after age 55 before they begin to fall off. Other workers immediately observe a continuous decrease in their pension accruals as a fraction of salary after the discontinuous drop at age 55.

The logical extension of looking at the decision of whether to continue working towards the normal retirement age is to examine the decision to work past that point. Table 3 examines the pension accruals of a worker as a percentage of salary after attaining the normal retirement age. Three cases are considered. The first case is where the worker continues to build up his annuity based on the same formula as before age 65. That is, if a worker began with the firm at age 40 and would receive an annuity equal to 25 percent of salary at age 65 he would receive an annuity equal to 26 percent of final salary if he left at age 66. The second case assumes that the worker only accrues extra benefits after age 65 because of a higher final salary, but years of service beyond age 65 are not included. In the third case benefit accruals stop at age 65. In all cases the pension opportunity cost of working an extra year is that a year's benefits are forfeited. Thus, if a worker has been with the firm for 25 years and is in a plan that does not accrue benefits after age 65 then the worker's pension benefits attributable to continued service would be minus 25 percent of salary.

TABLE 3

PENSION ACCRUAL AFTER NORMAL RETIREMENT AGE

Experience		0%	5%	10%
10		-2.0	2.0	6.0
15		-7.0	-1.0	5.0
20		-12.0	-4.0	4.0
25	Full Accrual	-17.0	-7.0	3.0
30		-22.0	-10.0	2.0
35		-27.0	-13.0	1.0
10		-10.0	-6.0	-2.0
15		-15.0	-9.0	-3.0
20		-20.0	-12.0	-4.0
25	Salary Accrual	-25.0	-15.0	-5.0
30		-30.0	-18.0	-6.0
35		-35.0	-21.0	-7.0
10		-10.0	-10.0	-10.0
15		-15.0	-15.0	-15.0
20		-20.0	-20.0	-20.0
25	No Extra Accrual	-25.0	-25.0	-25.0
30		-30.0	-30.0	-30.0
35		-35.0	-35.0	-35.0

Note that unless the plan provides full accruals after age 65 and the employee has a high rate of salary growth, pension accruals after age 65 are negative. Thus by holding down the employee's nominal salary growth the firm can get some leverage from the pension plan and effectively give the employee a large cut in total compensation.

Table 4 combines data from Tables 1 and 2 to provide a comparison of what the effect of the early retirement option is on a worker's pension accruals. The table indicates on successive lines the benefit accruals of a worker who started with the firm at a given age and has a given rate of salary growth, as a function of attained age. As an example, consider the worker who enters the

firm at age 35 and has a salary rising at a five percent annual rate. Given the plan described in this paper, such a worker would have benefit accruals of 2.1, 3.6, 6.3, 11.1, and 20.0 percent of salary at ages 45, 50, 55, 60, and 65. If the plan did have an early retirement option the worker would have accruals at rates of 3.8 percent of salary at age 45, 7.3 percent at 50, and 13.7 percent just before reaching age 55. These higher accruals (relative to the non-existence of the early retirement option) are caused by the fact that if such a worker left the firm he would receive a pension with a higher actuarial value by beginning benefits at age 55 than he would have received had he been forced to wait until age 65 to begin receiving benefits.

At age 55 the worker with an early retirement option finds his pension accrual falling from 13.7 to 5.6 percent of salary. At this point the accrual drops to virtually the same level as for the plan without an early retirement benefit. There are two offsetting factors. By working from age 55 to 56 the worker accrues some benefits made much more valuable by the option of the worker to begin benefits at age 56 rather than 65. On the other hand, there is an opportunity cost to not exercising the option at age 55. The early retirement option thus raises the value of the newly accrued benefits from 6.3 to 13.7 percent of salary, an increase of 7.4 percent. However, the opportunity cost of not exercising at 55 comes to 8.1 percent of salary, so the net benefit of continuing work at age 55, given the identical salary, is .7 percent of salary less for the worker with an early retirement choice.

This gap continues to grow as the worker gets older and the opportunity cost of not taking retirement gets higher. Pension accruals thus drop continuously to 2.6 and minus 2.8 percent of salary at ages 60 and 65, respectively. As can be readily seen, the early retirement option can dramatically change the timing of pension accruals.

TABLE 4

PENSION ACCRUALS AS A FUNCTION OF ATTAINED AGE
WITH AND WITHOUT EARLY RETIREMENT OPTION

Entry Age	E.R.	Attained Age								
		40	45	50	55-	55	55+	60	65	
30		0.9	1.4	2.1	...	3.2	...	4.9	8.0	
30	✓	1.7	2.6	4.2	6.9	...	-3.3	-9.8	-18.6	
35		...	1.4	2.1	...	3.2	...	4.9	8.0	
35	✓	...	2.6	4.2	6.9	...	-1.3	-6.9	-14.8	0% Salary Growth
40		...	...	2.1	...	3.2	...	4.9	8.0	
40	✓	...	...	4.2	6.9	...	0.8	-4.0	-11.0	
45		...	...	...	...	3.2	...	4.9	8.0	
45	✓	...	...	...	6.9	...	2.8	-1.1	-7.2	
30		1.4	2.4	4.2	...	7.1	...	12.4	22.0	
30	✓	2.6	4.5	8.4	15.4	...	5.3	1.6	-4.6	
35		...	2.1	3.6	...	6.3	...	11.1	20.0	
35	✓	...	3.8	7.3	13.7	...	5.6	2.6	-2.8	5% Salary Growth
40		...	...	3.1	...	5.6	...	9.9	18.0	
40	✓	...	...	6.3	12.0	...	5.9	3.6	-1.0	
45		...	...	...	...	4.8	...	8.7	16.0	
45	✓	...	...	...	10.3	...	6.2	4.6	0.8	
30		1.9	3.5	6.2	...	11.1	...	19.8	36.0	
30	✓	3.4	6.4	12.6	24.0	...	13.9	13.0	9.4	
35		...	2.8	5.2	...	9.5	...	17.3	32.0	
35	✓	...	5.1	10.5	21.6	...	12.5	12.1	9.2	10% Salary Growth
40		...	...	4.2	...	7.9	...	14.8	28.0	
40	✓	...	...	8.4	17.2	...	11.1	11.2	9.0	
45		...	...	...	...	6.3	...	12.4	24.0	
45	✓	...	...	...	13.7	...	9.7	10.3	8.8	

4. Accounting for Early Retirement Benefits

Current actuarial methods calculate the present value of accrued benefits in the presence of an early retirement option by assuming that some exogenous percentage of employees will take early retirement. The present value of vested benefits is calculated by finding the present value of future pension payments assuming all workers terminated immediately but only a fraction of those workers took early retirement. Because early retirement is better than actuarially fair, this method underestimates the present value of vested benefits.

The reason is that the decision of whether to leave the firm is affected by the employee's total compensation rather than just his pension benefits. If the employee already has the option of an attractive early retirement benefit then the salary the firm will have to pay to keep the worker will be higher than if the early retirement option did not exist. For accounting purposes, the higher salaries forced by the early retirement option are counted as costs when they are paid out. Actually, the cost can be traced back to when the early retirement benefit was accrued, because at that point in time the firm became committed to either paying out the expensive early retirement benefit or to paying the worker a high wage to keep him working.

Absenting taxes, pension liabilities should be calculated by assuming that were an individual to terminate his employment today he would begin his benefits at the point in time which would make the actuarial value of his pension greatest. Generally, this will mean that the individual would begin his pension as early as possible. To prevent the worker from taking the benefit at that time will require paying him increased future wages and/or regular pension compensation equal to the actuarial difference between the value of taking early

retirement and the actuarial value of accrued benefits without early
retirement.

For example, assume a 50 year old worker has a pension which would
be worth $90,000 if he took early retirement but only $50,000 if he retired
now but began benefits at age 65. The present value of the worker's future
compensation, for the sake of simplicity competitively determined, will be
$300,000 for the years between ages 50 and 65. To keep the worker, the firm
will have to provide the worker with salary plus future pension benefits with
a present value of $390,000 to keep the worker, because of the worker's option
of leaving and taking $90,000. If few workers in fact ever leave the firm
because it makes these payments, pension accounting would currently take the
actuarial value of accrued pension liabilities to be $50,000 and would charge
$340,000 (present value) to salary expense and accrued pension liabilities over
the following fifteen years. Actually, $90,000 is the liability to the fifty
year old worker and $300,000 is the amount that should be charged to salary
expense and accrued pension liabilities over the following fifteen years.

5. Implications of an Early Retirement Option

By accelerating the accrual of pension benefits--providing younger workers
with more accrued benefits--an early retirement option acts to neutralize the
skewing of benefit accruals toward older workers caused by inflation.

Personal and corporate tax considerations also come into play in evaluating
early retirement options. Some individuals may be in a high tax bracket at age
55 or 60 and may decide to postpone taking their pension until age 65 even if the
pre-tax actuarial value of benefits were greater if benefits began at the early
age. As for corporate taxes, because of current accounting methods a firm could
not fund its entire early retirement pension liability under any current actuarial

method. If a firm wished to overfund its pension liabilities as much as possible, it might find an early retirement option to be a constraint. However, while some such firms doubtless exist, in my experience I have not observed any firm that is up against this constraint.

Early retirement options should make joint survivor options less attractive. Joint survivor options involve the worker sacrificing some current pension benefits for some expected future benefits after he or she dies. There is a rate of interest implicit in taking the joint survivor insurance, and such a rate tends to be below current market interest rates. With early retirement the joint survivor option offers benefits farther in the future than with normal retirement. Thus, a below-market interest rate makes the joint survivor option even more costly (in terms of the reduction of the actuarial value of the pension) than with normal retirement.

An early retirement option can also be used as a substitute for serverance pay. Esmark, for example, will provide workers who leave the firm voluntarily a reduced early retirement pension while they provide employees who leave at the firm's request either (1) a full pension beginning immediately (not reduced for age) or (2) a normal pension (starting at age 65) plus severance pay.

Along similar lines, an early retirement option or the special treatment of workers over age 65 makes the real compensation of such workers as a percentage of salary much lower than it would be otherwise. Such pension rules can give firms the option of sharply reducing the total compensation of less productive older workers without reducing their nominal salary. Such an opportunity may enable firms to cause less productive older workers to either terminate or accept lower compensation without the firm having to either reduce salary or fire the worker. It is conceivable that this option may be attractive to firms worried

about being sued for age discrimination if older workers were fired or had
their salaries cut.

Conclusion

Given the terms of a pension plan, the addition of an early retire-
ment option increases the pension compensation of young workers while
reducing the compensation of older workers. The effect of an early retirement
option on a calculation of the wage/age profile of a worker can thus be
significant.

No currently accepted accounting method properly evaluates early retire-
ment options. Because such options tend to be better than actuarially fair,
any employee who does leave a firm early will probably choose the early retire-
ment option (except for some possible personal tax reasons). If the firm wishes
to keep an employee it must compensate him for his opportunity cost of not
leaving, which includes exercising the early retirement option. Whatever the
odds that the worker will actually leave the firm, the firm should calculate
its pension liability by figuring the value of the workers' benefits assuming
that the early retirement option will be exercised.

An early retirement option can provide a method of reducing the total
compensation of older workers without reducing their salary. Such an option
can be valuable to a firm that wishes to encourage older and less productive
workers to leave the firm without either reducing their nominal compensation
or firing them.

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