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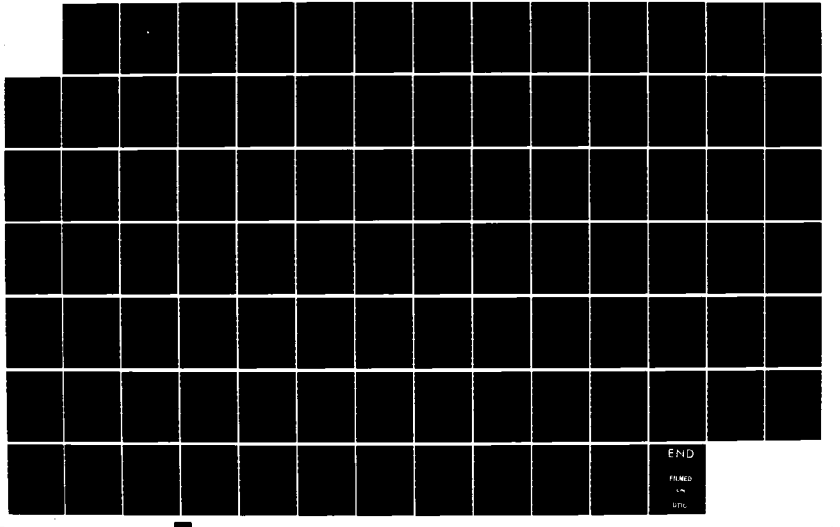

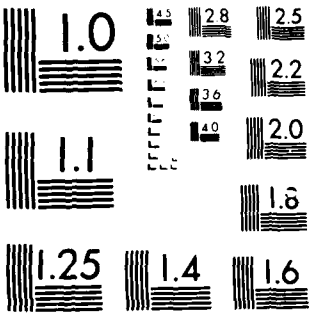

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NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

SELECTIVE REENLISTMENT BONUSES: USED AS AN ALTERNATIVE TO CURRENT AND PROPOSED RETIREMENT PLANS

by

Robert S. Tallerico

December 1985

Thesis Advisor: David R. Henderson

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Selective Reenlistment Bonuses:
Used as an Alternative to Current
and Proposed Retirement Plans

by

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

Congressional action to cut $2.9 billion from the FY 1986 DoD budget has settled the question of whether retirements benefits will be decreased. The decrease will affect only those individuals entering the services after the proposal is signed into law. The Pentagon is concerned with how this action will affect the attraction of new recruits and the retention of career personnel. Previous reviews of the retirement system have proposed reducing the annuities of the retiree as a method to reduce cost. A fully supported Selective Reenlistment Bonus (SRB) program would reduce the costs of retirement while providing an adequate number of personnel to maintain national security. SRBs would provide incentive for career personnel in undermanned ratings to continue service. The desired savings can be attained by reducing the future annuities of overmanned ratings. To succeed there must be monetary offsets established during active duty to reduce the effects of lower retirement annuities. The political sensitivity of the retirement system and the large federal deficit will support retirement pay changes.

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I. INTRODUCTION

A. STATEMENT OF THE PROBLEM

In a period of global conflicts, Americans have made the commitment to retain a strong "peace time" military. This commitment has been made with the understanding that military members and their families would be adequately cared for during active service. Retirement annuities are paid to career service personnel to augment their post-service incomes. Congress has identified the military retirement system, as well as many domestic programs, as prime candidates to reduce this deficit. Because of the federal deficit, documentation of requirements has stiffened. The Department of Defense, in support of all expenditures, has been hard pressed to justify personnel costs. The task of major decision makers is to determine to what extent the existing retirement system contributes to national security and if it is cost effective. Furthermore, if retirement benefits are reduced, how would this affect the manning of an all volunteer force?

B. THESIS OBJECTIVES

The objective of this thesis is to compare the current non-disability military retirement system with past proposals, and to present an alternative retirement plan. This alternative is the use of selective reenlistment bonuses to

retain personnel in undermanned ratings. The thesis will address proposals generated by Presidential and Congressional decree and will compare these with the present system. Whether the current system is excessive or not will be addressed because this thesis is an objective investigation of the economic efficiency of the current and proposed retirement systems.

The thesis shows, using the concept of present value, that increasing the selective reenlistment bonuses would lead to substantial reductions in the cost of military retirement. This savings can be attained by reducing retirement costs for personnel in overmanned ratings, yet preserving the value of retirement for personnel in undermanned ratings. SRB's would be targeted to attain adequate numbers of enlisted personnel and officers.

C. BACKGROUND

Efforts to change the military retirement system have persisted and continue to consume congressional attention. Military leaders, on the one hand, oppose change while certain members of Congress, on the other hand, lead the fight for reform. Both sides must focus on the one central issue: "Does the Uniformed Services retirement system effectively accomplish national security objectives"?

The purpose of the military retirement system is to support and complement the manpower force management requirements of the Services to meet nation security

objectives [Ref. 1: p. I-1]. The current structure and level of retirement benefits are the result of more than a century of modifications of the retirement system. The last major legislative modification in this process was the Defense Officers Personnel Management Act (DOPMA). No comparable legislation has been enacted for enlisted personnel. Congress has chosen to have the Services manage them through their respective administrative and reenlistment policies. The final and more recent legislative concern has been the increasing cost of retirement. In 1963, post-retirement recomputation of retirees' pay based upon active duty pay tables gave way to using the Consumer Price Index (CPI). Since 1963 military pay has been adjusted based upon the percentage increase of the CPI. This action was intended to reduce cost. In the process, the Civil Service and Uniformed Services systems were linked. The rising of the CPI has, in some years, caused the retiree adjustment to exceed the capped, active duty pay adjustment. Congress has actively considered limiting the post-retirement adjustments to less than the full CPI, again, as a means of reducing retirement costs.

II. HISTORY OF THE NON-DISABILITY MILITARY RETIREMENT SYSTEM

Although some pensions were paid to veterans early in this nations history, no legislative authority existed before an 1855 statute which provided for compulsory retirement of certain Navy officers [Ref. 2: p. 145]. A more complete statute, passed in 1861 (12 Stat. 287), became the first non-disability retirement act. This act and subsequent acts in 1861 (12 Stat. 329) and 1862 (12 Stat. 594) provided for involuntary retirement of regular officers of all branches of service. This involuntary retirement could occur after 40 years of service or at age 62. The government could force an officer to retire after reaching the specified age or length of service. While these laws authorized involuntary retirement, they did not require the government to exercise it [Ref. 1: p. VII-2]. Two enduring retirement principles were established along with reduction in forces in 1870; voluntary retirement of officers after 30 years of service and retired pay fixed at 75 percent of pay of the officer's grade [Ref. 1: p. VII-3].

An Act in August 29, 1916 established two new principles for the non-disability retirement system. First, officer selection boards were established in the Navy for promotion to Commander, Captain and Rear Admiral to alleviate promotion stagnation (allow upward mobility within the force

structure). Second, this action integrated the retirement program with an up-or-out officer selection promotion plan. Those not selected for promotion were retired at 2.5 percent of pay per year of service, not to exceed 75 percent of pay. This established the formula for computation of retired pay. [Ref. 1: p. VIII-3]

To alleviate promotion stagnation caused by the large influx of officers in the World War I years, the Act of June 23, 1938 was passed, revising the Navy's officer selection and retirement process. The selection board system was extended to all grades above Lieutenant junior grade. Limits on years of service for Lieutenant Commander through Captain were established, and voluntary retirement at 20 years of service at the discretion of the President was permitted. This became the model for the present 20-year non-disability retirement system [Ref. 1: p. VIII-27].

In the period following World War II until 1948, several laws were passed to standardize the officer retirement and promotion system among the Services. The statutory retirement age was lowered from 64 to 62 and voluntary retirement after 20 years of active service was permitted with retirement pay computed under the formula of 2.5 percent per year of service. The Officer Personnel Act of 1947 incorporated the various Services' retirement and promotion systems in one piece of legislation. There remained some differences between the Army/Air Force program and the Navy/Marines

Corps program [Ref. 2: p. 158]. No major changes occurred until the Defense Officers Personnel Management Act (DOPMA) was adopted December 12, 1980 to make retirement authority uniform across the different Services. The next portion of this section will explain the history of retirement pay adjustments.

Post-retirement adjustment to retired pay began with the Appropriation Acts of July 15, 1870 which provided for adjustment in the retired pay of officers who were already retired based on the new active duty rate [Ref. 2: p. 158]. This adjustment became known as a "recomputation" of retired pay and was alternately repealed and reinstated until 1963. [Ref. 1: p. VII-8]. The uniformed services Pay Act of 1963 replaced the recomputation method with an adjustment procedure based on increase in cost of living measured by the Consumer Price Index (CPI) [Ref. 2: p. 145]. Although the formula has been modified several times, the concept of adjusting retirement pay based on the CPI increase is still in use today.

In 1982 Congress passed a law which temporarily capped cost-of-living adjustments (COLA) at one-half the assumed inflation rate until FY 1985, COLA increases in fiscal years

1983, 1984, and 1985 [Ref. 3: p. 2]. In April 1984 Congress passed legislation delaying the May 1984 COLA increase to January 1, 1985 and created a new base period for calculating retired COLA similar to the quarter-to-quarter formula used for social security recipients.

The Department of Defense Authorization Act of 1981 changed the method of computing retirement for those entering the Service after September 7, 1980. The member's monthly retired pay base is now computed as the average of the member's highest three years of basic pay instead of his terminal basic pay. Lawrence J. Korb, Assistant Secretary of Defense (Manpower, Installations, and Logistics) has stated that the high-three plan cut the value of retirement by about 13 percent [Ref. 4: p. 28]. Other recent legislation requiring rounding down to the nearest dollar the initially computed gross retired pay, and amended the six-month rounding rule have lowered retired pay [Ref. 4: p. 28]. In fact, all changes to the military retirement system since 1975 have been at the retiree's expense.

III. SHOULD THE MILITARY RETIREMENT SYSTEM BE CHANGED?

Military retirement pension policy has been a major topic of discussion among military manpower planners for numerous years. Congress has demanded reviews of the system, seeking answers to question such as: What current rules need changing? What savings could be attained? What would be the repercussion of such changes? This chapter will address the advantages and disadvantages to changing the present military retirement system.

A. BENEFITS OF CHANGE

1. Comparability

Comparisons are often made between the military retirement system and civilian plans. It is generally agreed that the military retirement system provides more generous benefits than are available in most non-military plans. Together with social security, the cost of benefits for military retirees amounts to about 40 percent of military salary. Salary is defined as the sum of basic pay, allowances for quarters and subsistence, and the tax advantage that occurs because the allowances are exempt from federal taxes [Ref. 5: p. xv]. Typical private-sector pension plans offered by large employers, in combination with Social Security, have total accrual costs of roughly 14 percent of salary (not including the cost of retirement

related fringe benefits, thrift plans, stock options, and other types of deferred compensation, which have a combined average cost of 2 percent of salary). The Civil Service Retirement System has an accrual cost equal to about 30 percent of salary (net of the employee's contribution). The advantage afforded by the military system over civil service and other systems lies not so much in its higher level of annual benefits as in the length of time they are received. Military retirees often begin receiving benefits around age 40; most other retirees do not receive benefits until age 60 [Ref. 5: p. xvii]. Table I lists typical monthly annuities received by military officers and enlisted personnel, while Table II shows the cost as a percentage of the Department of Defense and Federal Budgets.

Benefits under specialized government plans resemble military benefits more closely. Military retirement is slightly more generous than benefits for federal air traffic controllers and, with some exceptions, those for state and local policemen and firemen. Federal protective services personnel leaving after 20 years also receive smaller benefits than military retirees, but slightly higher benefits after 30 years of service. [Ref. 5: p. xvii]

Other countries' military retirement plans differ from that of the United States in many ways, including age at retirement, minimum length of service, integration with social insurance, and inflation protection. In general,

TABLE I

1984 RETIREED PAY AND LIFE-TIME VALUE

Grade	YOS	Monthly Annuity	Undiscounted Life-time Value
0-6	30	$3,122	$836,469
0-5	20	1,641	569,440
E-8	30	1,543	404,032
E-7	20	771	263,015

(Note: The values in the last column are not present value figures).
Source: Department of Defense, "FY 1983 DoD Statistical Report on the Military Retirement" (Arlington, Va: Office of Actuary, Defense Manpower Data Center, 1984, p. 249

U.S. military retired pay exceeds that under most other countries. For 20 year retirees the U.S. system is considerably more generous than most, while for 30-year personnel it generally pays only slightly higher benefits. [Ref. 5: p. xviii] Australia is an exception, the generosity of the 20 year retirement for that country is higher than the United States. However, the thirty year retirement benefits are not greater than the United States [Ref. 6: p. VII-29].

The concept of present value is critical to understanding of the value of an annuity. The present value of a future payment or series of payments represents the amount received today that would be equivalent in value to the future payment or payments. The future value of a sum of money held today refers to the amount that would be

TABLE II

UNIFORMED SERVICES RETIREMENT COSTS

FY	Budget Outlays (Billions) Nominal Ret. Cost	Constant 85 $ cost	Military Retirement as Total % of Fed.	% of DoD	Ret. (000)	Cost Per Retiree (Con. 85)
1940	.11	.87	.7	1.5	50	-----
1950	.22	.95	.5	1.7	130	7307
1960	.77	2.57	.8	1.7	250	10280
1970	3.20	8.04	1.5	3.7	760	10579
1980	12.50	16.15	2.0	8.5	1260	12817
1982	14.90	16.50	2.0	8.1	1300	12692
1984	17.10	17.30	1.9	6.0	1380	12536

(Note: Con. 85 means dollar values are 1985 dollars.)
Source: Department of Defence, "Fifth Quadrennial Review of Military Compensation, Volume 1, Uniformed Services Retirement System" Washington, D.C. Office of the Secretary of Defense, January 1984), p. VIII-6

accumulated at some future date if the sum of money was invested at a particular rate of return (or interest rate). Thus, in present value terms, $100 received one year from now, has a present value (today) of $95, if the discount rate is 5 percent. The reason is that if $95 is invested at an annual interest rate of 5 percent in one year it will appreciate in value to $ 100. Therefore, if $100 is a

future payment, then it has to be discounted back to today's value. This is accomplished by using a discount rate. With a discount rate of 5 percent the future $100 has a value of $95 today.

Another example of present value is if a $1000 lump sum payment is received now, it has a present value of $1000. This value remains constant despite the individual's discount rate. However, if this lump sum payment is to be received in the future, the discount rate will reduce the value of the payment today. If the payment is to be received ten years in the future the value today of that $1000 payment, discounted at a 3 percent rate, is $744. Table III shows the value of a $1000 payment if it were received ten years in the future using different discount rates.

TABLE III

PRESENT VALUE OF $1000 USING DIFFERENT DISCOUNT RATES

Discount Rate	Payment Is To Be Received in 10 Years Current Value	Present Value 10 Years From Now
3	$ 1000	$ 744
5	1000	614
10	1000	386
15	1000	247
20	1000	162

The Department of Defense recognizes the time value of money and its relationship with government expenditures. As stated in a Department Instruction, Economic Analysis and

Program Evaluation for Resource Management:

> rates will be treated as a cost which is related to all government expenditures.... This policy is based on the premise that no public investment would be undertaken without explicitly considering the alternative use of the funds which it absorbs or displaces.

Money has a value directly linked to the time of its receipt. This time factor is what makes the military retirement pension so generous compared to other systems. For example a Commander (O-5) retiring during 1985 after twenty years of service receives an annual pension of $21,084. Suppose he starts receiving this at age 43 until his death at age 73. This pension has a present value at the time of retirement of $198,758 using an interest rate of 10 percent. Most Americans work in a labor force which has placed the retirement age at about 62-65. If the present value is computed for both individuals at age 43, the civilian worker (who retires at age 62) would have to draw an annual annuity to age 73 of $97,385 to be comparable to the military retiree.

While the above illustration may not be evident to those unfamiliar with the present value concept, it does demonstrate the dramatic impact time has on the value of money. (This is discussed in more detail below)

The Digest of Selected Pension Plans lists numerous pension plans for civilian occupations [Ref. 7: pp. 43-59]. Tables IV and V list the annuities and present values of

selected pension plans for civilian occupations which are similar to military ratings. To compare with military retirement the present value at retirement age, which is between 60-65 for civilians, has been discounted back to age 43, using a 10 percent discount rate (43 is approximately the time a military annuity starts for an officer.) For example, the present value of an annuity for an 0-5 with 20 years to service is $198,758. At the twenty year point the 0-5 has an income of about $45,000 and his retirement annuity is $21,084. Of the sixteen civilian occupations reviewed the retirement plan of the Maritime Pilot (a harbor pilot, who guides ships in and out of ports) had the closest annuity payment of that of an 0-5. At twenty years of service the Maritime Pilot receives an annuity of $16,551 and the present value of this annuity, assuming mortality at age 73, is $88,302 at age 65. To compare this amount with the annuity of the 0-5, it must be discounted back to age 43. At that point the value of the civilian annuity is $10,861. This is much lower than the $198,758 for the 0-5. At 30 years of service the 0-5's annuity has increased to $32,736 as compared to the civilian Pilot's thirty years of service annuity of $24,804. The present value discounted back to age 43 is $278,714 for the officer and $16,276 for the civilian.

A similar enlisted example, is an E-7 at 20 years of service who has an annual annuity of $9,912 and an annual

income of about $25,000. Of the sixteen civilian occupations represented, only the Boilermakers Union had an annuity close to the E-7's -- at $9,219. Most civilian annuities at this pay level are in the $5-7,000 range. Computing the present values of both annuities, as was done above for the officer and Maritime Pilot, the E-7's annuity has a present value of $95,234 at age 39 while the Boilermaker's annuity has a value of $6,049 for 20 years of service and $9,120 for 30 years of service.

The time in which annuities are available is an important relationship. In Tables IV and 0 the civilian annuities are received for only 8-13 years using a mortality age of 73, where as the military annuities are drawn over a 30-34 year time period. A definite conclusion can be drawn that the military retirement annuities are more generous than civilian annuities. The most significant factor is not the size of the annuities, but rather the length of time in which the military personnel draw these benefits.

The civilian pension plan reviewed designated ages 62 and 65 as retirement ages. Some companies allow earlier retirement. If an individual retires at an earlier age, receiving a less generous annuity, then the present value of that annuity is reduced.

TABLE IV

PENSION PLANS AND PRESENT VALUES AFTER 20 YOS

Company Name	Income Range	Ret. Age	Annuity after 20 YOS	P.V. at Ret. Age	P.V. at 43
American	20000	62	3744	24512	4019
Standard	32500		5912	38398	6297
	45000		8268	53700	8806
Long-	20000	65	3744	19974	2457
Shoreman	32500		3744	19974	2457
	45000		3744	19974	2457
Boeing	20000	62	4179	26947	4419
Machinist	32500		6708	43568	7145
	45000		10000	64950	10651
Boiler	20000	65	9219	49183	6049
Makers	32599		9219	49183	6049
	45000		9219	49183	6049
Carp'ters	20000	65	4212	22471	2764
	32500		4212	22471	2764
	45000		4212	22471	2764
Elect.	20000	65	1872	9987	1228
Cont.	32500		1872	9987	1228
	45000		1872	9987	1228
Utility	20000	60	3540	26593	5265
Workers	32500		7675	54515	10793
	45000		10748	78343	15115
Operating	20000	62	3744	27512	4019
Engineers	32500		4680	30396	4984
	45000		5616	36476	5982
Exxon	20000	65	4180	22300	2742
	32500		7753	41362	5087
	45000		11616	61918	7615
T'phone	20000	65	4134	22054	2717
Workers	32500		7675	40946	5036
	45000		10748	57370	7052
Clerical	20000	65	3463	18474	2272
Workers	32500		6770	36116	4442
	45000		10002	53680	6602

Table IV
Pension Plans and Present Values after 20 YOS
(Con't)

Company Name	Income Range	Ret. Age	Annuity after 20 YOS	P.V. at Ret. Age	P.V. at 43
IBM	20000	65	4680	24967	3071
	32500		6411	34205	4207
	45000		8923	47605	5855
Maritime	20000	65	4368	23303	2886
Union	32500		4368	23303	2886
	45000		4368	23303	2886
Maritime	20000	65	7098	37867	4657
Pilots	32500		11824	63085	7759
	45000		16551	88302	10861
Aviation	20000	65	3541	18892	2323
Machinist	32500		6708	35787	4401
	45000		9828	52432	6449
Steel	20000	65	4024	21468	2640
	32500		6505	34205	4268
	45000		9094	48520	5968

Note: Table derived using a discount rate of 10 percent.

TABLE V

PENSION PLANS AND PRESENT VALUES AFTER 30 YOS

Company Name	Income Range	Ret. Age	Annuity after 30 YOS	P.V. at Ret. Age	P.V. at 43
American	20000	62	5616	36475	5982
Standard	32500		8861	57552	9438
	45000		12417	80648	13226
Long	20000	65	5616	29961	3685
Shoreman	32500		5616	29961	3685
	45000		5616	29961	3685
Boeing	20000	62	6333	41132	6745
Machinist	32500		10233	66463	10899
	45000		15178	98581	16167
Boiler	20000	65	13899	74151	9120
Makers	32599		13899	74151	9120
	45000		13899	74151	9120
Carp'ters	20000	65	6318	33606	4145
	32500		6318	33606	4145
	45000		6318	33606	4145
Elect.	20000	65	2808	14980	1843
Cont.	32500		2808	14980	1843
	45000		2808	14980	1843
Utility	20000	60	6910	49081	9718
Workers	32500		11528	81883	16212
	45000		16130	114571	22685
Operating	20000	62	5616	36476	5982
Engineers	32500		7020	45594	7477
	45000		8424	54714	8973
Exxon	20000	65	6255	33370	4104
	32500		11622	62003	7626
	45000		17316	92380	11362
T'phone	20000	65	6910	36864	4534
Workers	32500		11528	61501	7564
	45000		16128	86042	10583
Clerical	20000	65	4087	21805	2682
Workers	32500		8065	43206	5292

Table V
Pension Plans and Present Values after 30 YOS
(Con't)

Company Name	Income Range	Ret. Age	Annuity after 30 YOS	P.V. at Ret. Age	P.V. at 43
	45000		12200	65082	8005
IBM	20000	65	7020	37451	4606
	32500		7893	42112	5179
	45000		11013	58754	7226
Maritime	20000	65	7020	37451	4606
Union	32500		7020	37451	4606
	45000		7020	37451	4606
Maritime	20000	65	10639	56760	6981
Pilots	32500		17737	94627	11639
	45000		24804	132329	16276
Aviation	20000	65	5319	28380	3490
Machinist	32500		10046	53596	6592
	45000		15085	80479	9898
Steel	20000	65	6208	33123	4074
	32500		9750	52016	6397
	45000		13650	72822	8957

Note: Table derived using a discount rate of 10 percent.

2. Retired Pay Costs

As stated earlier, much of the attention and criticism of the military retirement system is caused by the sheer magnitude of retired pay cost. The 13 billion dollars paid to military retirees in FY 1983 represents the highest cost ever and the estimated 17.5 billion dollars for 1985 demonstrate the extent of the growth in spending of the taxpayers' dollars. [Ref. 8: p. 17]

In FY 1983 the average number of years-of service at retirement of the service member is 22.4 and the average age at retirement is 47.4. In Fy 1983, 45 percent of the military personnel who retired that year completed exactly 20 years of service (YOS) [Ref. 6: p. I-7]. As shown in

Table I the monthly annuity and expected lifetime retired pay is a considerable amount. As shown in Table II there has been significant growth in the active force non-disability retirement budget outlays over the past 30 years. Analysis of FY 55 to FY 82 active force retirement cost growth indicates that 55 percent of the increased cost of retirement was due simply to inflation. This increase is in nominal dollars and does not raise real costs. Increasing real costs, came from an eleven-fold increase in the retired population (19 percent) and from wage growth (21 percent), which is the increase of wages above the influx of inflation. [Ref. 6: p. IV-34] Thus over the span of 37 years real retirement costs have increased 40 percent. Assuming a constant total force size, the rate of growth in retirement cost should decrease. The total cost of retirement therefore is expected to keep rising: however, the rate of growth is expected to decrease. [Ref. 6: p. IV-34]

3. Structure of Pay

The military pay structure does not yield any differentials in incomes based on type of skill or rating. Pay rates are set to correspond to the established pay grades. This means that cooks get the same pay as technicians, assuming, they are in the same pay grade. Such a rigid pay scale offers too little incentive for the more demanding ratings. These ratings require people who are of higher quality and who receive more training. Since

retirement is a function of base pay, this pay inadequacy is carried over into the retirement system. Just as active duty pay does not depend on the skill, risk factor, or education level, neither does the retirement system.

Supporters of the current system justify it by pointing to the hardships and amount of risk involved on the job. Many of these supporters feel that these hardships should be offset by high annuities in retirement. What these supporters should be arguing for instead is higher supplemental proficiency pays while on active duty. The arduous duty and risk involved in assignments such as submarine duty, sea duty, and flight crew, demand higher pay. The people assigned to these jobs are receiving proficiency pay now, and if retention and attainment of these people are too low then it is appropriate to raise this type of pay. It is not efficient to raise the pay of everyone on active duty, as an across the board basic pay increase does. Similarly, high pensions for everyone, regardless of risk or other hardships incurred, are an inefficient way to pay retirees. The hardships and risks endured by military personnel are important and relevant items for demanding higher pay. However higher pensions are an inefficient way to pay retirees.

There is one case when it is appropriate to raise retirees' pay along with that of active duty personnel. This is an effective way to pay retirees whose discount rates are

lower than that of the government. As will be shown in the chapter on discount rates, in such a case it is cheaper for the government to pay higher annuities over a period of time instead of large lump sum payments.

4. Changes In Technology

Advances in technology since World War II have had a dramatic impact on the quality of personnel required by the military. "Smart Bombs" and "Star Wars' weapon systems have increased the use and operation of data processing systems. Clearly the armed forces' need for trained, experienced personnel is much greater and more pressing today than in the 1940s. By necessity the length of service consistent with the military training investment in people is much longer. [Ref. 9: p. 7]

The Fifth Quadrennial Review of Military Compensation addresses the problem of the different demands between the technician and foot soldier in its findings:

> The retirement system will help the retention of quality personnel only when the overall compensation system is adequate to recruit and retain quality in the short term and to draw sufficient personnel to the point of retirement. The retirement incentive is a predominant part of an individual's decision process. This requires a careful balance between current and deferred compensation as well as Service force management policies.....Meaningful analyses of the retirement system must use a requirements-based methodology and an analytical approach that focuses on force structure. [Ref. 6: pp. IV 29-30]

The QRMC made the following recommendation towards the retirement policy:

> The evaluations of retirement system alternatives must analyze force impact. The risk of excessive departures from the military of trained and experienced personnel must be examined carefully to determine the impact on force structure . [Ref. 6: p. IV 35]

The basic purpose of all of the QRMC alternatives was to promote budgetary savings. But their alternatives would also have some side affects, such as increased incentives to lengther careers.

B. ARGUMENTS AGAINST CHANGE

In the previous section, the benefits of change were discussed. In this section the principle arguments supporting the present system will be addressed. The intent of the next two subsections is not to promote the current system, but rather to address the issues the supporters have given as reasons not to change. When there is a possible solution to their argument, it will be stated.

Some of those who oppose the system say the military retirement system is too generous when compared to the private sector plans. A General Accounting Office (GAO) study shows that it is also more generous than the retirement plans of other public safety forces. But behind the emotion laden debate over whether reduction in the value of retirement are a breach of faith with military personnel, there are questions about whether the current programs encourage the right mix of people to stay in the service for the right amount of time. [Ref. 10: p. 624] Both of these

questions will be discussed in further detail in the following sections. The primary arguments against change are more qualitative than quantitative. Almost every argument of equity, concerning changes to the retirement system, has a quantitative solution (use monetary offsets to solve the problem).

1. Breach of Faith

Several equity arguments have been used in the past by defenders and critics of the military retirement system. Defenders contend that current retirees and service members have an implicit contract with the government protecting their right to benefits under the current retirement system. They argue that the system in place at the time of enlistment (or even at the time a recruit signs a contract committing him to enter service at some future date) is an integral part of the terms of service offered by the government. But proponents of changing the system note the absence of any explicit legal contract and point to many changes in military compensation that have worked to the advantage of those currently in service or retired (for example, annual adjustment of active-duty pay to reflect changes in private-sector wages and salaries).

If the change in the retirement system is viewed by career personnel as a threat to their future retirement benefits, then the change is a potential threat to the effectiveness of a new retirement system. Those who support

changing the current retirement system state that the current system will be "grandfathered" (meaning it will not affect the benefits of those personnel already on active duty or retired). But many members lack faith and believe that the grandfather clause would not be over-ruled at a later date. An example of such a broken promise to retired military personnel was the promise to use of full CPI annual increases to adjust for cost of living increases. In the recent past, these increases have been a fraction of the full CPI increase, and at times the effective date has been delayed. These action have been taken to save money in a period of high federal deficits. It is highly conceivable that career military personnel will view any change as an attack on their future benefits, and some may leave the military because of this action. The supporters of change have not formulated a satisfactory quantitative solution to this distrust.

Some supporters of the current system say that reducing retirement benefits would affect recruiting. This argument is hard to support because only 12 percent of active duty recruits ever become eligible to receive retired pay [Ref. 5: p. 17]. Another argument against a retirement system change adversely affecting recruiting is that individuals at this age have extremely high discount rates, thus making the value of the retirement is not an enlistment consideration. Defenders of the current system counter the

argument by noting that the military personnel system operates differently from those of private-sector firms or government civilian agencies, and that a sharply tapered benefit structure may be required by military manpower needs. The argument has some validity, but the rebuttal is the same as with any equity argument: Changes in retirement system are justified only if they support the attainment of national security at the least cost. Thus equity considerations, whether raised to defend or attack the current system, are, first, hard to support, and second, of very little importance to government savings.

2. Attraction and Rention of Quality Personnel

Military leaders perceive the need for a youthful and vigorous military establishment. This concept refers to the popularized image of the combat infantry-man and not to the highly skilled technician.

Admiral Watkins summarized the military problem in attaining the proper quality of military personnel when he addressed the House of Representatives in April 1985. Discussing the importance of highly trained enlisted personnel to operate technically advanced weapons he stated: "We can no longer take people off the streets and off park benches and put them into Aegis Cruisers". [Ref. 10: p. 625]

The need for highly trained personnel can be attained by the use of reallocation of money into bonus

plans to support attraction and retention. Defense manning problems differ not only by grade but by Service, by assignment and, particularly, by skill. A large percentage of DoD skills are currently either overmanned or undermanned by at least 10 percent. [Ref. 11: p. IV-4] These manning problems persist for extended periods because existing management tools are either not used sufficiently, or, if used, prove inadequate to the task.

Before any changes are made to the current system one should look at not only costs factor, but also the manpower requirements. Table VI shows these manpower requirements, as projected by the Department of Defense. Military services have historically been among the strongest supporters of the current system. The the Services feel that any less generous alternative might be less effective in meeting manpower objectives.

The need for trained mid-career personnel as depicted by Table VI is a claim that military leaders use to defend the current retirement system. Certain factors often make a transfer from military to civilian life attractive before completion of 20 years. One of these factors is the frequency of promotion, which typically slows dramatically after 10 years of service, with the result that members feel they are not being rewarded for improvements in skill or productivity [Ref. 5: p. xvi]. The current system gives personnel the incentive to continue military service

with less chance of promotion although their productivity is still high. A less generous retirement may sway the decision in favor of civilian employment.

TABLE VI

CURRENT FORCE OBJECTIVES

	Enlisted Personnel		Officers		Total	
YOS	Number	Percent	Number	Percent	Number	Percent
0-4	1,016,400	56.3	84,700	31.4	1,101,100	53.1
5-10	407,300	22.6	81,600	30.3	488,900	23.6
11-15	177,500	9.8	45,100	16.7	222,600	10.7
16-20	147,500	8.2	35,400	13.2	182,900	8.8
21-30	56,400	3.1	22,400	8.4	78,800	3.8
Total	1,805,100	100.0	269,200	100.0	2,074,300	100.0

Source: Fifth Quadrennial Review of Military Compensation, Vol. I. pp. XI-5, XI-6

In conclusion of this section, a few general statements are offered. If the Services are short in skilled ratings they can use bonuses to man these ratings. If the Services can not attract the proper quality of recruit, they can use monetary rewards, such as bonuses or education benefits to achieve this goal. If the Services find certain ratings have greater risks, which affect retention, they can

use bonuses to man these ratings. However, using across the board pay raises to increase retention rates is an inefficient way to man the Services.

C. RETIREMENT ANNUITIES

The current military retirement system is directly linked to Basic Pay and length of service. Tables VII and VIII show the annual amounts paid to retirees. These pay scales are used for all calculations in this thesis.

TABLE VII

ANNUAL NON-DISABILITY RETIRED PAY (ENLISTED)

	YEARS OF SERVICE								
GRADE	20	22	24	25	26	27	28	29	30
E-9	12816	14844	16188	16850	19248	19980	20724	21468	22200
E-8	11232	13080	14268	14868	17184	17844	18704	19164	19836
E-7	9912	11640	12696	13224	15456	16056	16656	17244	17844
E-6	8676	9552	10416	10848	11280	11724	12156	12588	13020
E-5	7368	8100	8844	9024	9576	9948	10308	10680	11052
E-4	5928	6528	7716	7416	7716	8016	8304	8604	8904
E-3	5088	5604	6108	6360	6624	6876	7128	7380	7632
E-2	4296	4728	5148	5364	5580	5796	6012	6228	6444
E-1	3828	4212	4596	4788	4980	5172	5364	5556	5748

Note: Values derived by multiplying the monthly value by 12.
Source: Navy Times, August 26, 1985 p. 28

D. DOD READY FOR CHANGE

The Department of Defense is on record that it does not oppose changing the military retirement system as long as the change does not impair combat readiness. This position is also held by most responsible critics of the military retirement system. [Ref. 12: p. 1]

The military retirement system has existed since 1948 when the statutory retirement age was lowered from 64 to 62 and voluntary retirement after 20 years of service was permitted with the computed 2.5 percent per year of service formula. Any change which can enhance the goal of providing national security at a lesser cost should be supported by the military.

TABLE VIII

ANNUAL NON-DISABILITY RETIRED PAY (OFFICERS)

	YEARS OF SERVICE								
GRADE	20	22	24	25	26	27	28	29	30
0-9	34344	37776	41208	42936	44652	46368	48084	49800	51516
0-8	33672	37776	41208	42936	44652	46368	48084	49800	51516
0-7	30444	33492	36540	38064	39588	41100	42624	44148	45672
0-6	23316	27132	29604	30828	34776	36120	37452	38796	40128
0-5	21084	24012	26196	27288	28368	29460	30552	31644	32736
0-4	18252	17364	21900	22812	23724	24636	25548	26460	27372
0-3	15780	17364	18936	19728	20520	21312	22092	22884	23676
0-2	11712	12876	14052	14640	15228	15816	16392	16980	17568
0-1	9240	10164	11088	11544	12012	12468	12936	13392	13860

Note: Values derived by multiplying monthly rates by 12.
Source: Navy Times, August 26, 1985 p. 28

IV. FLAWS WITHIN THE CURRENT SYSTEM

The U.S. Armed Forces provide their members with one of the nations most generous pension plans. The length of service required to attain this annuity is a minimum of twenty years. The ability of immediate collection makes it one of the most expensive expenditures per capita of the budget. Since the generosity of this plan has been referred to throughout this thesis, the author acknowledges the cost as the primary flaw addressed by critics of the current system and will elaborate on other flaws within the system.

A. CURRENT NON-DISABILITY RETIREMENT SYSTEM

The key provisions of the military retirement system, as contained in 125 separate sections of Title 10, United States Code, are:

- Non-disability retirement after at least 20 years of active service at any age. An immediate monthly annuity equal to (base pay) times (years of service) times 2.5, limited to 75 percent of base pay.
- Optional contributory survivor benefit protection through retired pay reductions for retirees.
- Cost-of-living adjustment protection for both retired pay and survivor annuities based on the Consumer Price Index (CPI).
- No contributions by the members of the Uniformed Services.

- No vesting prior to 20 years of service.
- Interrelationships with Social Security, Veterans Administration benefits, and other Federal service.
- Recall authority, on post-service activity, retention of military status, and subjection to the Uniform Code of Military Justice. [Ref. 1: p. IV-1]

Voluntary retirement at 20 years of service (YOS) is by permission from Service Secretary, not by statutory right; however, it has, in fact come to be considered a right by Service members and is treated as such by the Services.

1. Length Of Service Required

Supporters of the current system stress that the 20 year retirement eligibility keeps the total force young and vigorous and enables promotion rates to remain at a desirable level. The main concern of the military supporters is to avoid having 40 to 50 year old infantry men on the front line.

John Warner in his studies on productivity of the naval forces contends that the productivity of a post 20 year individual is higher that his younger counterpart. In his study Warner made the following statement:

> As for increasing retention to the post 20 year personnel, the marginal cost of keeping them is low, primarily because the value of retirement benefits grows very slowly with years of service past 20 years. The cost of keeping someone from 20 to 30 years is considerably lower than the cost of keeping someone from the 11 to 20 year point. Further, what evidence there is suggests that 21 to 30 year careerests are no less, and probably more productive than 11 to 20 year personnel. [Ref. 13: p. 27]

Warner goes on to suggest that reducing the pay factor at the 20 year point and maintaining the 30 year benefit would substantially increase post 20 year retention.

The current system does not allow any lump sum payment or annuity to the individual who completes less than 20 years of service. The term "vesting" refers to paying a lump sum or annuity to a Service member who completes some minimum required years but doesn't remain in the Service long enough to be eligible for a 20 year retirement. Supporters of the vesting idea propose that this method would help retention early in a career and hopefully retain an otherwise doubtful individual to remain in the service. Another benefit of vesting is that it gives the Services more flexibility to separate persons involuntarily before 20 years of service, because they would still receive some benefits. Currently a separation pay is given to officers who are released involuntarily (12 times monthly pay but not to exceed $30,000) [Ref. 14: p. 13]. This policy is not exercised very often and there is no similar authorization for enlisted personnel.

2. Lack Of Incentives

The current system lacks incentive for post-twenty years of service. Because of the ability to immediately draw retirement annuities after completion of twenty years, a majority of the career service members leave the military because of the "working for half pay" concept. People

unfamiliar with the military retirement system think retirees get one-half of their current pay as their retirement annuity. In reality the half pay belief is not true since retirement is based on basic pay and accumulated years of service. Since neither the allowances nor proficiency pays are included in the retirement annuities a retirees monthly check is well short of 50 percent of base pay. For example a submarine Chief Petty Officer (E-7) retiring after 20 years would draw about 27 percent of his active duty pay (this reduced annuity is because of the loss of sea pay, proficiency pay, housing allowance, and subsistence allowance). DOPMA further reduced the annuities. Now retirement pay is computed by using the average base pay of the last three years of service.

As stated above, the retirement system is based on basic pay and length of service. However, within the present pay tables exists a pay ceiling on senior officers (Admirals and Generals) ranks. This cap on pay removes any monetary incentive of these top performers to stay in the military. One might arguestate that at this level noteworthy duty assignments alone should be enough to offer the personal satisfaction needed to retain these officers. But it is hard to imagine an Executive Vice President of General Motors not receiving a pay raise when he becomes President or Chairman of the Board of Directors. With all the mentions of comparability to civilian pay it seems that the talent of these

proven leaders is obtained for a fraction of that of their civilian cohorts.

In the enlisted ranks there exist a lack of incentive also. The retirement system fails to provide the proper retention mix of technicians and combat personnel vice support personnel. A more structured retirement policy may place a higher multiple based on the occupational rating needs of the services. In the enlisted ranks the number of support personnel that complete a 20 year career, as compared to combat personnel, is drastically higher.

Retention incentives of some form would be needed as a quid pro quo for retirement reform. But this does not necessarily mean that a complete restructuring of military compensation would be required. Differential bonus payment or other incentives could be used selectively to retain mid-level personnel. [Ref. 9: p. 77]

3. Present Value Of Current Military Retirement

The assumption that the life time value of a military retirement is the true value used by individuals when making a reenlistment decision is not correct. As mentioned earlier, money has a time value, therefore people must be compensated for deferring receipt of income.

Tables IX and X show the present value of military retirement for officers and enlisted members. The tables attained were computed by using an annualized value at a 10 percent discount rate of the stream of regular payments,

based on one-half of the basic pay (assuming the individual enlisted prior to Sept. 1980, otherwise, the annuity would be calculated based on the highest three years base pay). The mortality age used was age 73. Each computation was done assuming the service member had completed ten years of service and was at age 33 (officers) and 29 (enlisted). Basic pay was based on the October 1, 1985 pay scale.

TABLE IX

PRESENT VALUE COST OF CURRENT OFFICER RETIREMENT

YOS	Ret. Age	Years to Mortality	Annual Annuity	P.V. at Ret. Age	P.V at Age 33
			GRADE LEVEL 0-5		
20	43	30	21,084	198,758	76,720
21	44	29	22,140	217,429	72,600
22	45	28	24,012	223,455	71,282
23	46	27	25,104	231,884	67,246
24	47	26	26,196	239,955	63,108
25	48	25	27,288	247,693	59,198
26	49	24	28,368	254,858	55,559
27	50	23	29,460	261,693	51,815
28	51	22	30,552	267,971	48,234
29	52	21	31,644	273,657	44,879
30	53	20	32,736	278,714	41,528
			GRADE LEVEL 0-6		
22	45	28	27,132	252,490	80,544
23	46	27	28,368	262,035	75,990
24	47	26	29,604	271,172	71,318
25	48	25	30,828	279,825	66,878
26	49	24	34,776	312,427	68,109
27	50	23	36,120	320,853	63,528
28	51	22	37,452	328,491	59,128
29	52	21	38,796	335,507	55,023
30	53	20	40,128	341,649	50,905
			GRADE LEVEL 0-7		
25	48	25	38,064	345,506	82,575
26	49	24	39,588	355,658	77,533
27	50	23	41,100	365,091	72,288
28	51	22	42,624	373,855	67,293
29	52	21	44,148	381,791	62,613
30	53	20	45,672	388,851	57,938

Note: Table derived using a discount rate of 10 percent.

TABLE X

PRESENT VALUE COST OF CURRENT ENLISTED RETIREMENT

YOS	Ret. Age	Years to Mortality	Annual Annuity	P.V. at Ret. Age	P.V at Age 29
			GRADE LEVEL E-7		
20	39	34	9,912	95,234	36,760
21	40	33	10,404	99,555	35,441
22	41	32	11,640	110,882	35,371
23	42	31	12,168	115,340	33,448
24	43	30	12,696	119,685	31,477
25	44	29	13,224	123,895	29,610
26	45	28	15,456	143,833	31,355
27	46	27	16,056	148,309	29,365
28	47	26	16,656	152,568	27,462
29	48	25	17,244	156,523	25,669
30	49	24	17,844	160,310	23,886
			GRADE LEVEL E-8		
22	41	32	13,080	124,600	39,747
23	42	31	13,680	129,672	37,747
24	43	30	14,268	134,504	35,374
25	44	29	14,868	139,398	33,292
26	45	28	17,184	159,914	34,861
27	46	27	17,844	164,825	32,635
28	47	26	18,504	169,496	30,509
29	48	25	19,164	173,951	28,527
30	49	24	19,836	178,206	26,552
			GRADE LEVEL E-9		
25	44	29	16,188	157,961	37,752
26	45	28	16,860	179,121	39,048
27	46	27	19,980	184,555	36,541
28	47	26	20,724	189,831	34,169
29	48	25	21,468	194,865	31,957
30	49	24	22,200	199,444	29,717

Note: Table derived using a discount rate of 10 percent.

V. DECISION MAKER ALTERNATIVES

The military retirement system has been the subject of continued examination since it assumed its current form, soon after World War II. Since 1967, nine major studies have recommended extensive changes in the retirement system; two of these have resulted in the formation of comprehensive legislative reform proposals. Although Congress did not enact either proposal, it has made other less sweeping changes in military retirement. In this chapter, three alternatives to the current system will be reviewed. The first option is the proposal of the Fifth Quadrennial Review of Military Compensation. The second option, which is structurally simpler than the QRMC proposal, is a Department of Defense proposal which has a variable multiple factor in computing retirement pay. The third option is this author's proposal, to use selected reenlistment bonuses in the undermanned ratings to maintain retention. In the author's proposal the multiplier will be the same as the DoD proposal versus, the 2.5 percent of base pay presently used in the current system.

Each option will be addressed by reviewing the major changes and by computing the present values of the annuities paid under each option. Once each option's present value is attained, then a comparative analysis will be presented

displaying the savings or additional costs of that option. Before presenting the options it is imperative to review the term "economic indifference".

A. ECONOMIC INDIFFERENCE

Rational individuals are indifferent to the timing of payments they receive as long as the present value of payments over their lifetime is equal. Using this assumption, an individual would be indifferent about receiving a reduced retirement annuity as long as a bonus was paid in an amount such that the present value of both pay systems were equal. The author offers the following assumption: When an annuity is reduced, retention of career personnel can be held at a maximum by preserving the present value of the retirement benefit. The present value of retirement benefits can be protected for desired personnel through the use of SRBs. The objective of using selected reenlistment bonuses is to maintain the desired manning levels in the ratings which are undermanned. This selective use of bonuses to only undermanned ratings reduces the "rents" to individuals who would have continued their career without a supplemental bonus.

If the reader is not familiar with the concept of present values, he is encouraged to review that section in Chapter 3.

B. FIFTH QUADRENNIAL REVIEW OF MILITARY COMPENSATION

This Congressional mandated review was charged by the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics). This review paid special attention to the level and structure of special and incentive pays and to the military retirement program. QRMC V began by addressing the question of the Services' requirements for personnel. Requirements are best expressed in terms of the force profile, the distribution of officer and enlisted members by pay grade and length of service. The actual force profile in existence at any time can and usually does differ form the Services' objectives. QRMC V found that the Services' force profile objectives generally paralleled the average of the force profiles of the past seven years (1976-1982).

QRMC V then asked what the effect would be on the actual forces and objectives if the current system was replaced by a different one. More specifically, the study tried to determine whether an alternative retirement system could provide the same retention incentives and thus produce an adequate force profile while reducing cost.

QRMC V concluded that such an alternative could be found, but that it did not have many of the characteristics found in earlier studies. QRMC V ruled out reducing the value of military retirement for members who retire after 20 years or more of service. Equally important, it prescribed an increase in the value of benefits for those who fail to

complete 20 years. Thus, instead of recommending reduction in retirement cost, QRMC actually recommended increases in retirement cost.

1. Major Changes

QRMC V retained the minimum eligibility for retirement at 20 years and the average of high-three year pay base for calculating retirement pay. However, the method of calculating retirement pay was altered. A three percent reduction for each year short of 30 years of service was recommended. This meant the maximum percentage of base pay would remain at 75 percent but the minimum would be reduced to 45 percent, vice 50 percent of base pay. Along with the computation change was a change in cost of living adjustment (COLA). Retirees under age 62 would receive 3/4 of the CPI increase COLA adjustment upon retirement until age 62. After age 62, COLA would be equal to the CPI increases. There would not be any restoration of the lost value caused by the COLA differentials between retirement age and age 62. Tables XI and XII give detail retirement pay and present value costs for enlisted personnel and officers.

The QRMC's recommendation that deviates the most from the current system is the use of lump sum payments upon retirement. A member retiring after 20 years or more of service could receive cash payments equal to twice final base pay for officers, and three times base pay for enlisted. Under this system, an individual after 20 years

of service, but before retirement, could choose interest-only loans up to the cash amount.

The lump sum payments do reduce the present annuity payment. However, the large undiscounted lump sum payments make this system more expensive than the current system. In addition, individuals who complete 30 years of service receive the same 75 percent of base pay as the current system plus a large lump sum payment. Tables XI and XII display a comparison to the two annuities. Present value calculations were attained by using a discount rate of 10 percent.

Under QRMC's provisions, service members with less than 12 years of service would be immediately assigned to this new retirement system. Members already having completed 12 or more years of service prior to enactment could have a choice to remain with the current system or change to the QRMC V proposal.

TABLE XI

PRESENT VALUE COST OF QRMC 5 ENLISTED RETIREMENT

YOS	Ret. Age	Lump Sum Bonus	Current Annuity	QRMC Annuity	P.V. at Ret. Age	P.V at Age 29
			GRADE LEVEL E-7			
20	39	59,472	9,912	6,938	126,132	48,686
21	40	59,472	10,404	7,595	132,148	46,251
22	41	59,472	11,640	8,846	143,738	45,853
23	42	59,472	12,168	9,612	150,584	43,669
24	43	59,472	12,696	10,410	157,607	41,450
25	44	59,472	13,224	11,240	164,779	39,383
26	45	59,472	15,456	13,601	186,042	40,557
27	46	59,472	16,056	14,610	190,267	37,672
28	47	59,472	16,656	15,656	202,880	36,518
29	48	59,472	17,244	16,726	211,293	34,652
30	49	59,472	17.844	17,844	219,782	32,747
			GRADE LEVEL E-8			
22	41	67,392	13,080	9,940	162,080	51,703
23	42	67,392	13,680	10,807	169,831	49,251
24	43	67,392	14,268	11,699	177,678	46,729
25	44	67,392	14,868	12,637	185,788	44,403
26	45	67,392	17,184	15,121	208,108	45,367
27	46	67,392	16,844	16,238	217,382	43,041
28	47	67,392	18,504	17,393	226,711	40,807
29	48	67,392	19,164	18,589	236,124	38,724
30	49	67,392	19,686	19,836	245,598	36,594
			GRADE LEVEL E-9			
25	44	76,896	16,188	14,331	211,163	50,467
26	45	76,896	16,860	15,938	234,521	51,125
27	46	76,896	19,980	18,181	244,833	48,477
28	47	76,896	20,724	19,480	255,332	45,959
29	48	76,896	21,468	20,823	265,906	43,608
30	49	76,896	22,200	22,200	276,340	41,174

Note: Table derived using a discount rate of 10 percent.

TABLE XII

PRESENT VALUE COST OF QRMC 5 OFFICER RETIREMENT

YOS	Ret. Age	Lump Sum Bonus	Current Annuity	Annual Annuity	P.V. at Ret. Age	P.V at Age 29
			GRADE LEVEL O-5			
20	43	84,336	21,084	14,758	223,459	86,255
21	44	84,336	22,140	16,162	235,773	82,520
22	45	84,336	24,012	18,249	254,234	81,100
23	46	84,336	25,104	19,832	267,583	77,599
24	47	84,336	26,196	21,480	281,092	73,927
25	48	84,336	27,288	23,194	294,867	70,473
26	49	84,336	28,368	24,963	308,503	67,253
27	50	84,336	29,460	26,808	321,050	63,379
28	51	84,336	30,552	28,719	336,192	60,514
29	52	84,336	31,644	30,694	349,839	57,376
30	53	84,336	32,736	32,714	363,050	54,394
			GRADE LEVEL O-6			
22	45	93,264	27,132	20,620	285,153	90,963
23	46	93,264	28,368	22,410	300,265	87,076
24	47	93,264	29,604	23,979	312,911	82,295
25	48	93,264	30,828	25,895	328,312	78,466
26	49	93,264	34,776	30,255	365,074	79,586
27	50	93,264	36,120	32,508	382,032	75,642
28	51	93,264	37,452	34,830	398,757	71,776
29	52	93,264	38,796	37,244	415,350	68,117
30	53	93,264	40,128	40,128	434,913	64,802
			GRADE LEVEL O-7			
25	48	121,776	38,064	31,973	411,994	98,466
26	49	121,776	39,588	34,441	431,198	94,001
27	50	121,776	41,100	36,990	450,358	89,170
28	51	121,776	42,624	39,640	469,458	84,502
29	52	121,776	44,128	42,382	488,295	80,080
30	53	121,776	45,672	45,672	510,627	76,083

Note: Table derived using a 10 percent discount rate.

C. DEPARTMENT OF DEFENSE PROPOSAL FOR RETIREMENT SYSTEM

This Department of Defense proposal was designed to comply with the $2.9 billion cut in the accrual fund, from which persons joining the service in the future will draw their benefits. The Department of Defense was required by Congress to provide two proposals to achieve the $2.9

billion reduction, one involving a COLAs and one which doesn't affect COLAs. The option to be reviewed in this case is the option involving the change in the multiplier.

1. Major Changes

The DoD proposal retained the minimum eligibility for retirement at 20 years, and the average of the high-three basic pay for calculating retired pay. However, the major change concerns a variable multiplier. Essentially there are two ways to change the cost or retirement benefits. One involves the "multiplier", a figure that is multiplied by the number of years a person spent in the military to determine the percentage of basic pay on which benefits are based. The other way to change retirement cost is by changing the fraction used in computing the cost of living adjustment, which is based on the Consumer Index Price (CPI). As example of the latter, if the CPI increased by 4 percent the COLA could be increased by less than 4 percentage points. This reduced annuity can have a substantial effect on the retirement costs if the COLA increases are below the CPI for several years.

As mentioned in an earlier chapter the current system uses a multiplier of 2.5 percent times the number of years served to compute the retirement annuity. With the DoD proposal, retirees would receive 42 percent of their basic pay after 20 years based on a multiplier of 2.1 percent for each year of service. The multiplier would

increase to 2.5 percent a year for the next five years so a member would draw 44.5 percent for 21 years service, 47 percent for 22 years and so forth. Thereafter the 26 year and beyond the multiplier would increase to 4.5 percent so retirees would reach the maximum of 75 percent at 30 years. At the 30 year point the annuity of this proposal would be equal to that of the present system. [Ref. 15: p. 15]

Comparison of the retirement options will be presented in the last section of this chapter. Table XIII and Table XIV give detailed annual annuities and present values for enlisted and officer personnel under this retirement system. Present values were calculated using a discount rate of 10 percent.

D. AN ALTERNATIVE: SELECTIVE REENLISTMENT BONUS SYSTEM

Those opposed to the current system are interested in one major objective: Reducing the cost of the military retirement. The military leaders are against change because of the effects a reduced annuity may have on retention of career personnel. Because of Congressional action to reduce the accrual retirement fund, the question is on longer "whether" the system changes but "when and how".

If the goal is to simply to reduce retirement cost there are infinite ways to achieve this goal. However, if the ultimate goal is to maintain the required career personnel to keep the force ready then, the goal becomes more complex and the retirement plan must be more complicated. This

TABLE XIII

PRESENT VALUE COST OF ENLISTED RETIREMENT

DEPARTMENT OF DEFENSE 1985 PROPOSAL

GRADE LEVEL E-7

YOS	Ret. Age	Years to Mortality	Annual Annuity	P.V. at Ret. Age	P.V at Age 29
20	39	34	8,326	79,996	30,878
21	40	33	8,818	84,379	29,532
22	41	32	9,946	94,754	30,226
23	42	31	10,475	99,293	28,794
24	43	30	11,003	103,727	27,280
25	44	29	11,531	108,037	25,820
26	45	28	13,553	126,130	27,496
27	46	27	14,628	135,126	26,754
28	47	26	15,704	143,850	25,893
29	48	25	16,768	152,205	24,961
30	49	24	17,844	160,310	23,886
		GRADE LEVEL E-8			
22	41	32	11,177	106,476	33,965
23	42	31	11,776	111,631	32,373
24	43	30	12,365	116,570	30,658
25	44	29	12,964	121,468	29,030
26	45	28	15,069	140,232	30,570
27	46	27	16,257	150,173	29,734
28	47	26	17,446	159,811	28,766
29	48	25	18,635	169,152	27,741
30	49	24	19,836	178,206	26,552
		GRADE LEVEL E-9			
25	44	29	14,701	137,742	32,920
26	45	28	16,879	157,075	34,242
27	46	27	18,204	168,150	33,293
28	47	26	19,539	178,984	32,217
29	48	25	20,875	189,489	31,076
30	49	24	22,200	199,444	29,717

Note: Table derived using a discount rate of 10 percent.

section presents a possible alternative to past recommendations for retirement plans. The proposal employs the present value concept. It is structured to reduce cost to

TABLE XIV

PRESENT VALUE COST OF OFFICER RETIREMENT

DEPARTMENT OF DEFENSE 1985 PROPOSAL

YOS	Ret. Age	Years to Mortality	Annual Annuity	P.V. at Ret. Age	P.V at Age 33
		GRADE LEVEL 0-5			
20	43	30	17,710	166,952	64,443
21	44	29	18,766	175,821	61,537
22	45	28	20,519	190,953	60,914
23	46	27	21,611	199,623	57,890
24	47	26	22,703	207,961	54,693
25	48	25	23,795	215,988	51,621
26	49	24	24,876	223,490	48,721
27	50	23	26,841	238,430	47,209
28	51	22	28,806	252,658	45,478
29	52	21	30,771	266,108	43,641
30	53	20	32,736	278,714	41,528
		GRADE LEVEL 0-6			
22	45	28	23,185	215,759	68,827
23	46	27	24,421	225,578	65,417
24	47	26	25,656	235,016	61,809
25	48	25	26,882	244,008	59,317
26	49	24	31,565	283,579	61,820
27	50	23	32,909	292,330	57,881
28	51	22	35,311	309,720	55,749
29	52	21	37,725	326,252	53,505
30	53	20	40,128	341,649	50,905
		GRADE LEVEL 0-7			
25	48	25	33,191	301,282	72,006
26	49	24	35,933	322,828	70,376
27	50	23	37,446	332,632	65,861
28	51	22	40,188	357,491	63,448
29	52	21	42,930	371,258	60,886
30	53	20	45,672	388,851	57,938

Note: Table derived using a discount rate of 10 percent.

the government. However, rather than stopping at cost reduction, this proposal, includes the use of selective reenlistment bonuses to enhance retention in undermanned ratings.

1. Major Changes

The only major change in this proposal is the efficient use of selective reenlistment bonuses (SRBs). The current selective reenlistment bonus system is used as an incentive to enhance retention. The bonuses are determined by three factors. The first depends on manning level of the rate and pay grade. Using the manning level, an award factor is determined ranging from one to six. This award factor is used to multiplied by the second factor which is monthly base pay. The third factor is the number of years for which the individual will reenlist. An example is an individual in a undermanned rate who has an award level of 3, a monthly pay is $1,200 and he wishes to reenlist for four years. His reenlistment bonus would be $14,400 (under the current system bonuses are capped at $20,000). This bonus is calculated by multiplying $1,200 times the award level(3), times the number of years, (4).

The current SRB system has flaws. As mentioned above, there is a cap on reenlistment bonuses. While $20,000 is a lot of money, it represents a much smaller percentage pay increase than normally thought. The switch to lump sum bonuses has had a large effect on retention rates in recent years. However, even with lump sum payments, personnel in award level 5 and 6 ratings can reach the cap

with only three and four year reenlistments. Another flaw in the current SRB system is that reenlistment bonuses are paid only to enlisted personnel in zones A, B and C. Zone A is length of service (LOS) 1-4 years, Zone B is LOS 5-8, and Zone C is LOS 9-12. By Congressional law, no bonus can be paid past 14 years of service.

The next section will investigate the cost of using bonuses to buy back the personnel losses due to reduced annuities. a selective reenlistment bonus system which will maintain retention in undermanned ratings.

Using the ACOL and B/REFT models Op-01B3 (Economic Analysis Department of OPNAV) estimated Navy enlisted personnel losses which would occur with a change to the retirement system. The change was the DoD proposal mentioned earlier. Estimated personnel losses in Zone A were 525, in Zone B were 526, and in Zone C were 445. Not all of the projected enlisted personnel loss were in critical (undermanned) ratings. Ideally SRBs would be used only to retain those personnel who were in critical ratings. Of the 525 losses in Zone A only 206 people were considered critical. However, all individuals in Zone A would receive the bonus. There were 11,904 reenlistees in zone A. The award levels ranged from 1 to 5.5 and the average monthly pay for this LOS group is $931. Thus to maintain these 206 people, the cumulative cost would be $238,080,000. Similar calculations were employed for Zone B and C. Zone B had 90

critical personnel and 2,402 reenlistees with a SRB cost of $21,163,288. For Zone C there were 124 critical persons and 1,520 reenlistees. The reenlistment bonuses cost was $20,129,360.

From above, the average bonus paid to a person in Zone A was $20,436. Since the bonus level is capped at $20,000 the figure for Zone A is $238,080,000. Zones B and C average payments were were $10,364 and $13,243 respectively. Because these projected bonuses are less than the cap, no adjustment is required.

The important point is that a retirement benefit cut of $2.9 Billion is a major savings to the government. The percent of Navy enlisted personnel in relationship to the total DoD retirement population over the past 5 years is 23.120 percent [Ref. 1: p. XI-16]. The Navy enlisted portion of the $2.9 billion reduction, using this population percentage, is slightly more than $670 million. The Navy can maintain critical ratings with about $279 million in SRB's. In short, the Navy could save $391 million by substituting SRB for some retirement pay. This is a substantial saving.

2. Use of Bonuses After LOS 14

Over 33 percent of all retirees leave active duty with exactly 20 years of service [Ref. 5: p. xi]. If the

rating from which they retired was undermanned, a way to provide an incentive to continue service is through the use of bonuses.

The proposed reduction of the retirement funds for future years will remove $2.9 billion from the accrual retirement funds. If the Services could barter to receive some of this money back in the form of SRBs (to be used at periods after LOS 14) the undermanned ratings could be maintained at a higher level. Unfortunately there is not yet a model to predict how much money would be needed.

SRBs could be used for both officers and enlisted personnel. These bonuses should be used only to achieve higher manning levels in undermanned ratings. For example submarine ratings, aviation personnel, and nuclear trained personnel would be excellent candidates for this bonus program. The formula for calculating the amount of the bonus could be calculated as it is for the current SRB program. Tables XV and XVI show the cost for both officers and enlisted. The bonus amounts used in these tables are illustrative only.

An example is given to provide an understanding of how these tables were constructed. An 0-5 under the DoD retirement proposal has an annual annuity of $17,710. If he is in an undermanned designator, a lump sum bonus of $20,000

could be offered for some period of continued service. This bonus amount does not affect the amount of any future retirement annuity, but raises the present value of his retirement benefit from $166,952 (from Table XIV) to $186,952 (from Table XV). Another point to be emphasized here is the effect this bonus has on personnel with less than 20 years of service. As shown in Table XVIII the present value of the retirement system for an 0-5 with SRB has increased from $64,443 (from Table XIV) to 72,163 (from Table (XV), for those personnel with 10 years of service. For the E-7, Table XVI shows the annuity value increased from $30,878 (from Table XIII) to 34,738 (from Table XVI), for individuals with 10 years of service.

TABLE XV

PRESENT VALUE COST OF DOD PROPOSAL W/SRBS

GRADE LEVEL O-5

YOS	RETIREMENT AGE	LUMP SUM BONUS	ANNUAL ANNUITY	P.V. AT RET. AGE	P.V AT AGE 33
20	43	20,000	17,710	186,952	72,163
21	44	20,000	18,766	195,821	68,537
22	45	20,000	20,519	210,953	67,294
23	46	20,000	21,611	219,623	63,690
24	47	20,000	22,703	225,988	59,953
25	48	20,000	23,795	235,988	56,401
26	49	20,000	24,876	243,490	53,808
27	50	20,000	26,841	258,433	51,169
28	51	20,000	28,806	272,658	49,078
29	52	20,000	30,771	286,108	46,921
30	53	20,000	32,736	298,714	44,508
		GRADE LEVEL O-6			
22	45	25,000	23,185	240,759	76,802
23	46	25,000	24,412	250,578	72,667
24	47	25,000	25,656	260,016	68,384
25	48	25,000	26,882	269,008	64,292
26	49	25,000	31,565	308,579	67,270
27	50	25,000	32,909	317,330	62,831
28	51	25,000	35,311	334,720	60,249
29	52	25,000	37,725	351,252	57,605
30	53	25,000	40,128	369,649	54,630
		GRADE LEVEL O-7			
25	48	30,000	33,191	331,282	79,176
26	49	30,000	35,933	352,828	76,916
27	50	30,000	37,446	362,632	71,801
28	51	30,000	40,188	382,491	67,048
29	52	30,000	42,930	401,258	65,806
30	53	30,000	45,672	418,851	62,408

Note: Table derived using a discount rate of 10 percent.

3. Comparison of Retirement Options.

Table XVII shows the cost comparison between the current system and the three alternatives addressed in this

TABLE XVI

PRESENT VALUE COST OF DOD PROPOSAL W/SRBS

YOS	RETIREMENT AGE	LUMP SUM BONUS	ANNUAL ANNUITY	P.V. AT RET. AGE	P.V AT AGE 29
		GRADE LEVEL E-7			
20	39	10,000	8,326	89,996	34,878
21	40	10,000	8,818	94,379	33,302
22	41	10,000	9,946	104,754	33,416
23	42	10,000	10,475	109,293	31,694
24	43	10,000	11,003	113,727	29,910
25	44	10,000	11,531	118,037	28,210
26	45	10,000	13,553	136,130	29,676
27	46	10,000	14,628	145,126	28,734
28	47	10,000	15,704	153,850	27,693
29	48	10,000	16,768	162,205	26,601
30	49	10,000	17,844	170,310	25,376
		GRADE LEVEL E-8			
22	41	15,000	11,177	121,476	38,750
23	42	15,000	11,776	126,631	36,722
24	43	15,000	12,365	131,570	34,602
25	44	15,000	12,964	136,468	32,615
26	45	15,000	15,069	155,232	33,840
27	46	15,000	16,257	165,173	32,704
28	47	15,000	17,446	174,811	31,465
29	48	15,000	18,635	184,152	30,200
30	49	15,000	19,836	193,206	28,787
		GRADE LEVEL E-9			
25	44	20,000	14,701	157,742	37,700
26	45	20,000	16,879	177,075	38,602
27	46	20,000	18,204	188,150	37,253
28	47	20,000	19,539	198,984	35,817
29	48	20,000	20,875	209,489	34,356
30	49	20,000	22,200	219,444	32,697

Note: Table derived using a discount rate of 10 percent.

chapter. This table relates the cost differentals at the point of retirement.

Table XVIII shows the present value of benefits as are perceived by individuals after completing 10 years of

service. These figures are what the individual should use when determining cash flows in the future and should be used in reenlistment decisions.

The most relevant comparison would be of each system as a whole. This is not presented in this thesis because information concerning each retiree's rank, length of service, and base pay could not be attained. In Tables XVII and XVIII comparisons of pay scales are presented.

TABLE XVII

COMPARISON OF RETIREMENT SYSTEMS AT RETIREMENT AGE

GRADE	YOS	P.V. CURRENT	P.V. QRMC	P.V. DoD w/o SRB	P.V. DoD W/SRB
0-5	20	198758	223459	166952	186952
0-5	25	247693	294867	215988	235988
0-5	30	278714	363050	278714	298714
0-6	22	252490	285153	215759	240759
0-6	25	279825	328312	244008	269008
0-6	30	341649	434913	341649	366649
0-7	25	345506	411994	301282	331282
0-7	30	388851	510627	388851	418851
E-7	20	95234	126132	79996	89996
E-7	25	123895	164779	108037	118037
E-7	30	160310	219782	160310	170310
E-8	22	124600	162080	106476	121476
E-8	25	139398	185788	116570	136570
E-8	30	178206	245598	178206	193206
E-9	25	157961	211163	137774	157774
E-9	30	199444	276340	199444	219444

Note: Table derived using a discount rate of 10 percent.

TABLE XVIII

COMPARISON OF RETIREMENT SYSTEMS AFTER YOS 10

GRADE	YOS	P.V. CURRENT	P.V. QRMC	P.V. DoD w/o SRB	P.V. DoD W/SRB
0-5	20	76620	82255	64443	72163
0-5	25	59198	70473	54693	56401
0-5	30	41528	54394	41528	44508
0-6	22	80544	90963	68827	76802
0-6	25	66878	78466	59317	67270
0-6	30	50905	64802	50995	54630
0-7	25	82575	98466	72006	79176
0-7	30	57938	76083	57938	62408
E-7	20	36760	48686	30878	34738
E-7	25	29610	39383	25820	29910
E-7	30	23886	32747	23886	25376
E-8	22	37747	51703	33965	38750
E-8	25	33292	44403	29030	32615
E-8	30	26552	36594	26552	28787
E-9	25	37742	40467	32920	37700
E-9	30	29717	41174	29717	32697

Note: Table derived using a discount rate of 10 percent.

VI. EXPLOITING DIFFERENCES IN GOVERNMENT AND PERSONAL DISCOUNT RATES

A. DEFINITION AND EXAMPLE

A discount rate and discounting are used to determine the dollar amount which, if it were received today, would be equivalent in value to a series of future payments. The importance of ascertaining the personal rate of discount is demonstrated by the following example. Assume that after 20 years of service, an individual qualifies for a lump-sum retirement payment of $100,000. This amount could also represent the present value of a hypothetical retirement annuity evaluated at the point of retirement. The effect of this future retirement benefit on an individual's current retention decision depends on its perceived present value. The latter is affected first by the discount rate and second by the remaining time until 20 years of service is completed. In Table XIX the present value of the future $100,000 retirement benefit is calculated for several combinations of discount rates and current years of service.

Since personal discount rates affect career decisions, if the discount rate of an individual is higher than the government's discount rate, the government saves money by paying the individual a lump sum payment. This occurs because the individual values present income more highly compared to future income than does the government. On the

other hand if the individual's discount rate is lower than the government's discount rate then the government would lose money by paying a lump sum payment. This will be illustrated in the section describing lump sum payments.

Alternative assumptions about the discount rate affect the calculated present value. The implication for analyzing current and proposed retirement systems (as well as, other forms of delayed compensation) are quite clear. A lower discount rate increases the value of future payments. An individual with a low discount rate will be more positively influenced in his retention decisions by a future annuity than an individual with a higher discount rate. This perceived value for a future annuity increases at a greater rate for the individual with a low discount rate than a person with a high discount rate as time passes and the chance to collect the annuity gets closer. Thus a lower discount rate has a "pull" effect (attracts the person with a low discount rate) which increases as the time to draw upon the retirement benefit approaches.

B. PAST ANALYSIS

Numerous studies have been conducted in attempts to derive group and individual discount rates for different age groups. Clyke, Goldberg, Hogan and Mairs estimated discount rates for Navy enlisted personnel between 15 and 18 percent [Ref. 16: p. 2]. Black estimated discount rates at 13.5 for

TABLE XIX

PRESENT VALUE OF $100,000 RETIREMENT BENEFIT

(Available at 20 Years of Service)

Current Year of Service	Personal Discount Rate					
	.10	.12	.14	.16	.18	.20
5	$ 23900	18300	14000	10800	8400	6500
10	38600	32200	27000	22700	19100	16200
15	62100	56700	51900	47600	43700	40200
20	100000	100000	100000	100000	100000	100000

both officers and enlisted personnel [Ref. 17: p. 3]. These estimates were within the scope of previous studies accomplished by Heckman (18 to 20 percent) [Ref. 18: p. S-12], Landsberger (9 to 27 percent) [Ref. 19: p. 1351], and Hausmen (15 to 25 percent) [Ref. 20: p. 1122].

Thus from all of these studies the average discount rate is 17.8, rounded to 18 percent. All of these studies calculated real, not nominal discount rates. The government's discount rate is lower: between 4 and 6 percent. Table XIX gives an example of how the discount rate can affect the value of money.

C. EFFECTS ON RETIREMENT BENEFITS

In attempts to evaluate different retirement systems, models such as the Annualized Cost of Leaving (ACOL) model use annualized rates to combine streams of future earnings with current income into a single present value measure.

Table XX depicts an 0-4 with twenty years of service draws an annuity of $18,252. If his discount rate is 18 percent and he draws this annuity for thirty years, then his present value of the annuity is $100,696. This is the value of a lump sum payment he would be indifferent about receiving instead of the annuity. The cost to the government of the 0-4's annuity is $288,587, because the government discounts at 5 percent. By paying the individual the total lump sum, at the individual's discount rate, the government saves $187,891 and is not obligated for any future annuity. This savings is derived by subtracting the government's value of the original annuity ($288,587) from the individual's lump sum value ($100,696).

In Table XX the individual is given a lump sum of $20,139 after twenty years of service, which is 20 percent of his present value of the annuity ($100,696), and a new annuity of $14,601. The individual is still indifferent between the two amounts because in present value terms they are still equivalent. The government now pays the individual the lump sum value of $20,139, and a new annuity of $14,601. The present value of this annuity, discounted at

the government's discount rate, plus the lump sum, is $184,517. As a result the making the lump sum payment, which reduced the annuity payments, the government saves $104,070.

Table XX through Table XXII use similar calculations as were used above. These tables demonstrate the savings that can be attained by the government using different individual discount rates and maintaining a discount rate of 5 percent for the government.

TABLE XX

SAVINGS AT DISCOUNT RATE 5% GOVERNMENT AND 18% INDIVIDUAL

Grade	Annuity	Ind PV	Gov PV	Lump Sum	New Annuity	New Gov PV	Gov Saving
0-4	18252	100696	288587	20139	14601	184517	104070
0-5	21084	116320	324124	23264	16867	213512	110612
0-6	27132	139919	417100	27983	21705	272338	144762
0-7	38064	209999	585157	41999	30451	384816	200341
E-7	9912	54684	152377	10936	7929	100200	52137
E-8	13080	72162	201078	14432	10464	132235	68843
E-9	16188	89309	248858	17682	12950	163473	85385

Note:
1. Annuities are in 1985 dollars.
2. Government Saving are computed over a 30 year period.
3. Lump Sum Payments are given at the point of retirement.
4. Years of service for pay grades are 20 for 0-4, 0-5, E-7, 22 for 0-6, E-8, and 25 for 0-7, and E-9.

TABLE XXI

SAVINGS AT DISCOUNT RATE 5% GOVERNMENT AND 14% INDIVIDUAL

Grade	Annuity	Ind PV	Gov PV	Lump Sum	New Annuity	New Gov PV	Gov Saving
0-4	18252	127818	288587	25563	14601	189941	98616
0-5	21084	147651	324124	29530	16867	219418	104706
0-6	27132	190005	417100	38001	21705	282355	134745
0-7	38064	266560	585377	53312	30451	369129	216028
E-7	9912	69413	152377	13882	7929	103146	49231
E-8	13080	91599	201078	18319	10464	136122	64956
E-9	16188	113364	248858	22673	12950	168464	80394

Note:
1. Annuities are in 1985 dollars.
2. Government Saving are computed over a 30 year period.
3. Lump Sum Payments are given at the point of retirement.
4. Years of service for pay grades are 20 for 0-4, 0-5, E-7 22 for 0-6, E-8, and 25 for 0-7, and E-9.

1. Variable Lump Sum Payments

The previous tables displayed savings to government at various discount rates for the individual while maintaining a government discount rate of 5 percent. Tables XXIII and XXIV give the savings to the government with lump sum percentage changes varying from 20 to 100 percent. Table XXIII represents the savings attained in paying a retired 0-5 and Table XXIV represents the savings for an E-7. These two pay grades were used because they represent the typical pay grades at retirement.

TABLE XXII

SAVINGS AT DISCOUNT RATE 5% GOVERNMENT AND 12% INDIVIDUAL

Grade	Annuity	Ind PV	Gov PV	Lump Sum	New Annuity	New Gov PV	Gov Saving
0-4	18252	147019	288587	29403	14601	193781	94806
0-5	21084	169831	324124	33966	16867	223854	97270
0-6	27132	218548	417100	43709	21705	288063	129037
0-7	38064	306605	585157	61320	30451	404137	181020
E-7	9912	79842	152377	15968	7929	105232	47145
E-8	13080	105359	201078	21071	10464	138874	62204
E-9	16188	130394	248858	26708	12950	171869	76489

Note:
1. Annuities are in 1985 dollars.
2. Government Saving are computed over a 30 year period.
3. Lump Sum Payments are given at the point of retirement.
4. Years of service for pay grades are 20 for 0-4, 0-5, E-7 22 for 0-6, E-8, and 25 for 0-7, and E-9.

In Fiscal Year 1984 13502 officers and 30002 enlisted personnel retired from active duty. [Ref. 21: pp. E-7 and F-7]. Based on constant group discount rates, Table XXV shows the total government saving using a 20 percent lump sum bonus after 20 years of service. Greater savings are realized if larger lump sum payments are used.

If all the 1984 officer retirees were pay grade 0-5, which they are not, and all enlisted were E-7, again an assumption (but these are certainly attainable ranks within

TABLE XXIII

GOVERNMENT SAVINGS WITH VARYING LUMP PAYMENTS

Percent Annuity	Lump Sum	New Annuity	New Gov PV	Gov Saving
20	23264	16867	281560	41563
25	29080	15813	272173	51950
30	34886	14758	261760	62363
35	40712	13704	251383	72640
40	46528	12650	240996	83127
45	52344	11596	230609	93514
50	58160	10542	220222	103901
55	63976	9487	209819	114305
60	69792	8433	199432	124691
65	75608	7379	189045	135078
70	81424	6325	178658	145466
75	87240	5271	168271	155852
80	93056	4216	157868	166255
85	98872	3270	149141	174982
90	104688	2108	137092	187029
95	110504	1054	126707	197417
100	116320	0	116320	207804

Note: 1. Discount rate used for the government was 5% and individual discount rate was 18%
2. Dollars values are 1985 dollars.
3. Annuity used was that for an 0-5 with 20 year of service.

the scope of a twenty year career) the saving on total officer retirement pay would be $1,493,483,224, and $1,564,214,274 for total enlisted personnel retirement. The total savings would be $3,057,697,498. This example used an 18 percent individual discount rate because it was closest to the average figure attained by past analysis. By making these lump sum payments, the government could save more than the desired $2.9 billion that will be removed from the accrual fund. Table XXV shows government savings and costs using different individual discount rates. (Refer to section on Past Analysis)

2. Low Discount Rates

Previous examples used discount rates for the individual in the 12-18 percent range and the discount rate for government at 5 percent. When discount rates decrease, the value of an annuity increases.

Harry S. Gilman in his research for the Institute of Naval Studies estimated discount rates for individuals. Gilman's study showed that discount rates vary with age and income levels. Gilman's discount rate were geometric averaged discount rates, (discount rates that may vary throughout the life of the individual but are mathematically formulated into one constant rate). Any economic decision would be based on these discount rates. In his research Gilman estimated discount rates for individuals with income levels of $25,000 (typical for an E-7) and $47,000 (about

TABLE XXIV

GOVERNMENT SAVINGS WITH VARYING LUMP PAYMENTS

Percent Annuity	Lump Sum	New Annuity	New Gov PV	Gov Saving
20	10936	7929	139330	13046
25	13671	7434	134049	18328
30	16405	6938	128752	23624
35	19139	6442	123454	28922
40	21836	5947	118135	34241
45	24607	5451	112875	39501
50	27342	4956	107594	44782
55	30076	4460	102296	50080
60	32810	3964	96999	55377
65	35544	3469	91717	60659
70	38278	2973	86419	65957
75	41013	2478	81139	71237
80	43747	1982	75841	76535
85	46481	1487	70559	81817
90	49215	991	65262	87114
95	51949	495	59964	92412
100	54684	0	54684	95693

Note: 1. Discount rate used for the government was 5% and individual discount rate was 18%.
2. Dollars values are 1985 dollars.
3. Annuity used was an E-7 after 20 years of service.

TABLE XXV

TOTAL GOVERNMENT PRESENT SAVINGS WITH LUMP PAYMENTS

Gov Rate	Ind Rate	Officer (Cost)/Savings	Enlisted (Cost)/Savings	Total (Cost)/Savings
5	18	$1,493,483,224	$1,564,214,274	$3,057,597,498
5	14	1,413,740,412	1,477,028,462	2,890,768,814
5	12	1,313,339,540	1,414,444,290	2,727,783,830
5	3	(240,619,142)	(251,116,740)	(491,735,882)

Note 1. Dollars values are 1985 dollars.
2. Annuities used were that for an 0-5 and E-7 with 20 years of service.
3. Values inside parenthesis represent costs instead of saving to the government.
4. Lump sum payments of 20 percent of present value of the annuity was used in deriving savings/costs.

the income of an 0-5) below the 12-18 percent range (using constant 1985 dollars). For the $25,000 income level Gilman estimated discount rates of about 7 percent, and for the $47,000 income level, he estimated discount rates of about 3 percent. This suggests that an 0-5 and an E-7, after twenty years of service have discount rates of 3 percent and 7 percent, respectfully. [Ref. 22: p. 69] range. This establishes a case where the discount rate of an individual (an 0-5) is lower than the government's discount rate. The government's rate of return on long term bonds is slightly

above 10 percent (nominal); using an expected inflation rate of 5 percent, the government's real rate is about 5 percent. Table XXVI gives the additional cost to the government by paying these individuals in lump sum payments. In this case, lump sum bonuses cost the government more because the government has a higher discount rate than the individual.

TABLE XXVI

COST AT DISCOUNT RATE 5% GOVERNMENT AND 3% INDIVIDUAL

Grade	Annuity	Ind PV	Gov PV	Lump Sum	New Annuity	New Gov PV	Gov Add. Cost
0-4	18252	357736	288587	71547	14601	296008	15421
0-5	21084	413246	324124	82649	16867	341945	17821
0-6	27132	531787	417100	106357	21705	440027	22927
0-7	38064	746054	585157	149210	30451	617333	32176

Note:
1. Annuities are in 1985 dollars.
2. Government Costs are computed over a 30 year period.
3. Lump Sum Payments are given at the point of retirement.
4. Years of service for pay grades are 20 for 0-4, 0-5, 22 for 0-6, and 25 for 0-7.

3. Effects of Age and Income Level on Discount Rates

In a previous section of this chapter, the lump sum payments were varied to show government savings if the government's discount rate was lower than the individual's discount rate. This section, using Gilman's discount rates, will investigate the government savings attainable by using

lump sum payments at the point of retirement. An individual at YOS 14 discounts the annuity he will receive at retirement. According to Gilman's research an officer at YOS 14 discounts future payments at rate of 5.5 percent. After 20 years of service he assumes he will retire at the rank of 0-5. His discounted value of the annuity of $21,084 is $222,211 at YOS 14. The government's discounted value of the same annuity is $324,124 at YOS 20. These last two figures can not be compared because they are discounted back to different years of service. Because the government's discount rate is lower than the individuals, the government will save $3,545 by paying this individual a 20 percent lump sum upon retirement. This savings is computed by subtracting the government's present value of the annuity without the bonus at 20 YOS ($324,124), and the government's present value of the annuity with the bonus at 20 YOS (320,578). The individual is no worse off because the lump sum and new annuity have the same present value as the old annuity.

Gilman demonstrated through his research that discount rates varied by income and age. But at each age and income level the individual discounts at that constant discount rate throughout his life. For example an individual at age 50 and an income of $47,000 has a discount rate of 3.1 percent. This individual discounts all future amount at this constant rate. Using Gilman's constant discount rates, Table XXVII was derived. Of considerable

interest is that officers and enlisted personnel, after 14 years of service, do not discount a future retirement annuity at the same discount rate. In Gilman's study, people at age 37 and with incomes equivalent to that of an 0-5 discount at a rate of 5.5 percent. Individuals at age 33 and with incomes equivalent to that of a E-7 discount at 10.5 percent. Discount rates were substantially higher for younger personnel with lower income levels than those considered in this thesis. Since the government's real discount rate is 5 percent, the calculations for Table XXVII used this rate. As shown in that table it would be advisable to pay lump sum payments to officers and enlisted personnel. Enlisted personnel are younger and have lower income levels than officers and their discount rates are higher. With this higher discount rate the government saves more money by paying lump sum payments to enlisted personnel than it saves by paying lump sum payments to officers. Still by using this assumption, it is to the government's advantage to pay both enlisted and officers lump sum payments upon retirement.

In 1984 there were 3,010 Navy officers and 16,966 Navy enlisted personnel with 14 years of service [Ref. 21: pp. 8 and 9]. Assuming all officers would retire at the 0-5 level and all enlisted personnel at the E-7 level, the annual savings to the government would be $233,199,516. Assuming constant discount rates yield the conclusion that

the government would save even more if one considers when people decide to make the service a career. Retention rates for officers increase considerably at the 10 year point, upon selection to 0-4. Enlisted retention increases after the second reenlistment, around the 8-10 year period. Table XXVIII displays similar government savings as Table XXVII using 10 years of service as the decision point rather than 14. The annual savings to the government in this case is $290,067,638. Of extreme importance in these cases is the assumption that discount rates remain constant over the life of the annuity.

4. Equal Discount Rates

If the government's discount rate is equal to the individual's discount rate, then all payments are discounted equally. With equal discount rates the government would not benefit or lose by paying lump sum benefits.

5. Discount Rates Vary By Individual

In all the previous sections discount rates for the individual were group discount rates. The meaning of group discount rates is that all individuals in the group had the same discount rate. Realistically, discount rates vary among individuals. The government would prefer to pay lump sum payments to people with high discount rates because this would save the government money. The lump sum payment is an immediate payment and therefore not discounted. Lump sum payments would attract people with high discount rates.

TABLE XXVII

GOVERNMENT SAVINGS WITH CONSTANT DISCOUNT RATES

Grade	Annuity	Ind PV YOS 14	Gov PV YOS 20	Lump Sum	New Annuity	New Gov PV	Gov. Saving
0-4	18252	192363	280587	53051	14601	277512	3075
0-5	21084	222211	324124	61282	16867	320578	3545
0-6	27132	285953	417100	78861	21705	412531	4569
0-7	38064	401169	585157	110636	30451	578759	6398
E-7	9912	46681	152377	17369	7929	139261	13116
E-8	13080	61601	201078	22921	10464	183784	17294
E-9	16188	76238	248858	28367	12950	227447	21411

Notes:
1. Annuities are in 1985 dollars.
2. Government Costs are computed over a 30 year period.
3. Lump Sum Payments are given at the point of retirement.
4. Years of service for pay grades are 20 for 0-4, 0-5, E-7 22 for 0-6, E-8, and 25 for 0-7, and E-9.
5. Individual discount rates were 5.5 for officers and 10.5 for enlisted.
6. Individual present values were calculated after 14 years of service. Officer age was 37 and enlisted age 33.
7.Lump sum payments were 20 percent of individuals present value at 20 YOS.

Individuals with low discount rates would perceive future annuity payments as having a greater value than individuals with high discount rates. The government would prefer paying annuities to people with low discount rates. Lump sum payments would not be attractive to people with discount rates lower than the government's discount rate.

TABLE XXVIII

GOVERNMENT SAVINGS WITH CONSTANT DISCOUNT RATES

Grade	Annuity	Ind PV YOS 10	Gov PV YOS 20	Lump Sum	New Annuity	New Gov PV	Gov. Saving
0-4	18252	117387	280587	45765	14601	270026	10361
0-5	21084	135568	324124	52853	16867	312152	11972
0-6	27132	174457	417100	68014	21705	401684	15416
0-7	38064	244749	585157	95418	30451	563541	14973
E-7	9912	23772	152377	15512	7929	137404	14973
E-8	13080	31770	201078	20470	10464	181333	19745
E-9	16188	38824	248858	25334	12950	224414	24444

Notes:

1. Annuities are in 1985 dollars.
2. Government Costs are computed over a 30 year period.
3. Lump Sum Payments are given at the point of retirement.
4. Years of service for pay grades are 20 for 0-4, 0-5, E7 22 for 0-6, E-8, and 25 for 0-7, and E-9.
5. Individual discount rates were 6.9 for officers and 12.55 for enlisted.
6. Individual present values were calculated after 10 years of service. Officer age was 33 and enlisted age 29.
7. Lump sum payments were 20 percent of individuals present value at 20 YOS.

VII. CONCLUSIONS

The retirement system, established to support the objective of national security, has not efficiently met this objective. The overmanning and undermanning of enlisted personnel ratings in all Services demonstrates that the military compensation system is not efficient. Issues of equity, which most supporters address, are hard to substantiate. Even if the validity of these arguments could be proven, they are relevant to the question of whether the retirement system is efficient.

A. HOW TO CHANGE THE SYSTEM

This section leads the reader back to the initial question: Should the retirement system be changed? Military retirement benefits are very generous -- and very inefficient. The system needs to support Career Force Manning. The retirement system has very little effect on recruiting, because potential recruits have large discount rates.

Reallocation of pay, such as proficiency pay and reenlistment bonuses, is needed to support retention. Differentiation in pay is required to reward skilled technicians. This can be accomplished with bonuses. Previous across the board base pay raises have not achieved the manning levels or proper personnel mix desired. This type of

pay adjustment undercompensates the highly technical personnel and will overcompensate the non-skilled personnel.

The system should indeed be changed. This is not a new recommendation. For the past decade reallocations of pay have been recommended by numerous agencies and critics. Reallocation of pay, whether by targeted bonuses, or targeted educational funds are the efficient way to increase retention. The same, or perhaps, better recruiting and retention results could be achieved if the services would barter for a small percentage of the accrual fund reduction and use those funds as targeted pays.

If the across the board equity is the choice then, the use of lump sum payments should be employed by the government. As demonstrated in this thesis the larger the lump sum, based on the present value of the annuity, the more the saving to the government (if the government's discount rate is lower than the individual's).

B. WILL THE SYSTEM BE CHANGED

Will the retirement system be changed? Congress has provided a partial answer to this question. The proposal to reduce $2.9 Billion has passed both the House of Representatives and the Senate. The President has not signed this bill into law. However, no suggestions have been made that he will oppose the change.

The services will fight hard to gain some kind of compensation for this loss. As with most compensation

changes, the services will lean towards across the board compensation packages. Inefficient as this type of payment is, the services will try to defend their actions a a way of avoiding breaches of faith. Both of these arguments are qualitative and impossible to assess quantitatively. As shown in this thesis, the most efficient way to man the services is through bonuses.

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