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FUNDING THE MILITARY RETIREMENT SYSTEM: A PRIVATE SECTOR INVESTMENT APPROACH TO ACCRUAL ACCOUNTING

THESIS

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THESIS

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Preface

The purpose of this study was to investigate investment of the military retirement system in the private sector as opposed to investment within the government. The specific goals were to show whether a private investment strategy is feasible in terms of real interest rate and to determine any savings that such a strategy might offer to DOD and, ultimately, the American taxpayers. From a "macro" level, this study revealed that the private sector approach can potentially compete with the real interest rate currently used in the intragovernmental investment of the military retirement fund. However, this approach is not without implications which require further study.

In performing this research, I am greatly indebted to Lt Col Thomas F. Schuppe for his proposal of the topic to me, as well as his untiring assistance and motivation. I also appreciate the efforts of Dr. Thomas P. Cain and Dr. Charles R. Fenno as readers of my thesis. Special thanks are owed to Ms. Toni Hustead, the DOD Chief Actuary, and Maj Harvey R. Greenberg, Chief Legislative Affairs, HQ USAF, for putting up with my telephone calls and for taking time away from their busy schedules to personally assist me in my research. Finally, I thank David L. Penrod, Robert D. Meyers, and David M. Tate, investment experts, who found time during the stock market "Crash of October '87" to lend their assistance.

Eugene H. Henry

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Abstract

The military retirement system is frequently a candidate for budget cuts. Most cost-cutting proposals and legislative actions have been aimed at the benefit structure of the retirement system. However, Public Law 98-94, enacted on October 1, 1984, addresses the *funding* aspect of the military retirement system. The law, which established accrual accounting and a military retirement fund, ensures immediate recognition of the future costs of the retirement system when considering any force size changes and pay changes for DOD. To pay for these future costs, the retirement system partially relies on the investment of excess retirement funds in special interest Treasury securities.

This research concerns the investment aspect of accrual accounting, in particular, the possibility of investing the military retirement fund in the private sector instead of the within the government. To accomplish this "macro-level" research, it is necessary to determine representative private investment plans. The real interest returns of the plans, as determined by several factors such the management of the fund, inflation, and debt implications, are compared to the real return currently assumed by the DOD Office of the Actuary for the special issue securities. Subsequently, for plans showing an improved real return, the approximate

savings in terms of annual accrual charges are computed.

The research reveals that a private sector investment approach can provide an improved real return. However, the increased return of the private plans is not without implications such as risk and management of the fund, as well as effects on the national debt and government deficit spending.

The numerous implications and effects discovered in this study support the need for further research in this area to determine the complete impact of a private sector approach to the investment to accrual accounting and the military retirement fund.

FUNDING THE MILITARY RETIREMENT SYSTEM: A PRIVATE SECTOR INVESTMENT APPROACH TO ACCRUAL ACCOUNTING

I. Introduction

General Issue

The U.S. Military Retirement System (MRS) is a highly visible government entitlement program frequently scrutinized for budget savings. Studies and proposals have generally confronted the benefits afforded to the retired members in order to achieve potential savings.

Many political obstacles exist, however, that make a consensus on possible cuts difficult to achieve. For example, opponents to the current MRS contend that the system can sustain cuts in accrual costs amounting to as much as 76.7 percent for one fiscal year (3:xxi) while remaining comparable to other federal and civilian programs for similar workers. Meanwhile, proponents of the current system argue against such drastic measures because of the anticipated effects on the retention and morale of experienced and trained personnel.

Although a reduction in benefits would certainly reduce costs, the response by military members to benefit cuts could affect the United States defense posture. Perhaps Lieutenant General Chavarrie most aptly sums the predicament:

> We need to find ways to reduce the cost of the military retirement system, at the same time encourage some people to stay in service longer. That is a difficult combination to hook up [29:5].

Specific Problem

Operating in a pay-as-you-go fashion until October 1, 1984, the MRS has amassed over $500 billion in unfunded liability for retirees. This unfunded liability corresponds to the total retirement costs incurred by the government as a result of decisions made twenty to forty years earlier that increased manpower levels and military active duty pay. While the actual payments to retirees each year are generally expected to "acceptably" increase as a result of inflation, force size, and life expectancy, the unfunded liability growth is an unacceptable burden to the American taxpayers.

Responding to the growth in the unfunded liability, the U.S. Congress enacted Public Law 98-94 (currently chapter 74 of title 10, U.S.C.) on October 1, 1984 to establish an aggregate entry-age normal cost funding method, or accrual accounting, for the MRS (21:1). Accrual accounting does "not effect the amount of retirement benefits...nor [does] it affect annual outlays paid by the federal government" (4:ix). However, accrual accounting is

> a method of recording costs and setting aside funds in current budgets to pay the retirement annuities that eventually will be received by the military personnel who are in current service [4:ix].

In addition, the law requires the U.S. Treasury Department to pay an annual stream of payments to be

amortized via "public debt securities" (28:648). These payments will eventually eliminate the unfunded liability portion of the MRS. Furthermore, each year the Department of Defense (DOD) is required to pay an accrual charge as determined by an appointed Board of Actuaries for future retirement outlays.

Understandably, primarily because of the amount of the unfunded liability, volatility of economic conditions, and the fiduciary role of the U.S. Government, relatively conservative actuarial assumptions are used to determine the appropriate accrual charges each year. These assumptions, in particular the real interest rate, are challengeable. For example, the Air Force has argued for a higher real interest rate, perhaps based on the social discount rate. Such a revised rate would lower the DOD accrual charge necessary for future retirement benefits (14).

The purpose of this study is to investigate whether investment in the private sector under the accrual accounting method of the existing MRS can result in a greater real interest rate, and if so, to determine the amount of taxpayer savings the private sector investment approach would achieve.

Background

The U.S. Military Retirement System supports a tradition of compensating and recognizing "members who are retiring from long and honorable service" (11:Chapter 6, page 31). In particular, the compensation aspect attracts attention

because annual retired pay is attainable by nondisabled members after honorably serving 20 or more years. Retirees can receive lifelong annual payments amounting to approximately 50% to 75% of their respective annual active service base pay.

Because of its former method of funding, pay-as-you-go, the MRS has incurred a large unfunded liability that grows each year, and, like many other military programs, it has become a candidate for budget cuts. In the last eighteen years no less than nine major studies and two legislative proposals have focused on reducing the cost of the MRS (3:iii). Even after the implementation of accrual accounting, Congress passed an authorization that cut the accrual funding sixteen percent in order to achieve savings of $2.9 billion (12). The message of these activities is clear: the MRS continues to be a target for potential cost reductions.

Indeed, the prevailing concern is not necessarily the reduction of benefits, which could have retention effects, but the reduction of the tax burden associated with the unfunded liability of the MRS. Perhaps a different perspective directed at an alternative funding method rather than reducing present benefits would produce a plausible reduction in costs. Instead of relying only on tax dollars, the military retirement system could conceivably receive a substantial portion of its funding from investment earnings in the private sector, thus, reducing the tax burden.

Scope

This research will investigate possible reduction of costs in the present U.S. Department of Defense military retirement system. The baseline for determining the cost reduction effects of a private sector investment approach will be the most recent revision to the MRS, accrual accounting--not proposed systems intending to change the existing benefits or the calculation of the benefits.

Limitations

This study will not include any cost comparisons involving proposed alternative retirement systems. Furthermore, this study will not propose or research any changes to the existing benefits to the military members. Finally, this research will not investigate the administrative, legislative, regulatory , and philosophical aspects of converting to the proposed private sector investment approach to accrual accounting.

Research Question

Given the current benefits of the military retirement system, what, if any, real interest rate increase could be achieved by a military retirement system that invests its funds in the private sector, and, if an increase in the real interest rate were achieved, what savings to the U.S. Government and, ultimately, the taxpayers would be realized?

Subsidiary Questions

To answer the main research question, the following subsidiary questions must be satisfied:

1. What constitutes the current accrual accounting method used in the present MRS?
    a. What are the major agencies and their interactions and transactions?
    b. What is the flow of revenues and outlays?
    c. What are the unique terms and their definitions?
    d. What are the actuarial assumptions?
2. Is a private sector investment approach capable of producing revenue sufficient for the MRS?
    a. What are the possible portfolio alternatives?
    b. What are the strengths and weaknesses of the possible portfolio alternatives?
    c. What criteria determines feasibility?
    d. Which portfolio alternatives can be considered feasible?
3. What is the valuation of the current military retirement system?
4. What are the projected fiscal expenditures associated with the present military retirement system?
5. How do the private investment costs compare with the existing system costs?

II. Historical Development and Review

Scope and Organization

This review provides information on the history of the MRS, the establishment of accrual accounting, the current system, the issues concerning the MRS, and the proposed alternatives to the MRS. The first section, history, traces the evolution of military retirement in the United States. The second section describes the establishment of accrual accounting in the MRS. The current system, the third section, emphasizes the payment aspects of the MRS and provides the background for the fourth section, the issues. The final section, proposed MRS alternatives, discusses the nature of the alternatives proposed for cost reductions in the MRS. Concluding remarks follow the topic discussions.

History. Highlighted by legislation, the history of military retirement in the United States can be characterized by the following statement from the Fifth Quadrennial Review on Military Compensation:

> The evolution of the military retirement system has been guided by four principal motivations: (1) to provide for members who are old or disabled; (2) to help maintain a competitive employment position for the military; (3) to keep promotion opportunities open to young and able members; and (4) to avoid excessive costs [23:2].

Evidence of a military retirement system can be found as early as the colonial days. Beneficiaries of the "colonial retirement system" were disabled soldiers. For

example, the "Pilgrims at Plymouth provided in 1636 that any man sent as a soldier [to fight Indians] and returned maimed should be maintained by the colony during his life" (23:2). Providing livelihood was a precedent continued by law in the first national pension law of August 26, 1776. The law promised one-half salary for life, or for the duration of the disability, to disabled soldiers (23:2;9:VII-1).

After the first pension law, other disability retirement benefits were also instituted, but pensions based solely on service or nondisability were controversial. Veterans of the Revolutionary War were promised half-pay annuities for life in 1780; however, actual claims were settled for less than that value. Congress became more generous as the number of veterans declined and the treasury increased. By 1832, full pay for the service member's life was granted--regardless of need (23:2;9:VII-1).

The first legislation directed at involuntary separation was the Act of February 28, 1855 (9:VII-2). Although the 1855 act was not actually a retirement law, it began a precedent for separating officers for nondisability reasons. Under authority of the act, Naval officers who were adjudged incapable, but not disabled, could be separated involuntarily with partial pay (9:VII-2).

Nondisability separation reappeared in legislation passed during the Civil War "when it became necessary to retire older officers no longer fit for duty" (9:VII-2). The Act of 3 August 1861, which authorized retirement pay for

all officers voluntarily retiring from service, was the antecedent of today's military retirement system (3:4,9:VII-2).

In 1870, Congress established two more enduring principles. The first principle authorized voluntary retirement of officers after 30 years upon approval by the President. The second principle fixed the retirement annuity at 75% of the officer's pay based on the officer's grade. These principles applied to all Army and Marine officers. In 1873, the benefits were extended to Naval officers. Similar legislation was enacted in 1885 to include Army and Marine Corps enlistees. Naval enlistees were included in 1899 (23:2;9:VII-3).

During World War I, promotion stagnation in the Navy prompted recognition of length of service as well as grade in the computation of retired pay. Officers not selected for promotion were retired with pay computed at 2.5% of basic pay for each year served. A limit of 75% of active service basic pay was also established. Senior officers were moved to the retired list with service-in-grade credit, and younger officers were able to compete for the new openings (23:3;9:VII-4).

Following World War II, the Army and Air Force operated under one set of benefits, while the Navy and Marine Corps had a different set of benefits. Allegations of unfairness, inequality, and inefficiency were the impetus for the Army and Air Force Vitalization Act of 1948. Enactment of this

legislation standardized nondisability retirement for the Army, Air Force, Navy, and Marine Corps (23:4).

With the services under one set of rules, the focus of legislation shifted to cost reduction.

> Prior to 1958, retired pay was generally increased in direct proportion to change in active duty pay. The practice was discontinued with the Act of May 1958, when it was realized that a single 6% cost-of-living increase would cost only $35 million, as opposed to $65 million for linking the retired pay to active duty pay [22:5].

In 1963, retired pay funding methods changed to a permanent system of basing cost-of-living increases on the Consumer Price Index (23:5). Cost-of-living increases were originally scheduled for every six months. To relieve the tax burden, the schedule is now subject to change based on legislation.

Another legislative measure, enacted in 1980, reduced costs in a different manner.

> Retirees who enter active duty after September 7, 1980, will have their retirement benefits computed on the basis of the average of their highest three years' basic pay, rather than final basic pay [3:4].

Accrual Accounting for the MRS. By 1983 the focus of legislation was directed at an accounting method which would capture "the liability taxpayers are incurring for the future retirement costs of military personnel now on active or reserve duty" (4:ix). Subsequently, Public Law 98-94 (see Appendix A) instituted accrual accounting as the method to replace the pay-as-you-go method and "placed military retirement on the same accounting basis as private pension plans" (12).

Statutory Impact of Accrual Accounting. Three major provisions of the new law have a statutory impact on the government. One provision of the law mandates

> normal cost contributions by DOD on behalf of all future new entrants and current military personnel for the balance of their active careers [20:11].

With these "automatic" payments into a "trust fund," the MRS is not as dependent on Congress to obtain the necessary appropriation each year to pay for that year (20:24). However, because of the former pay-as-you-go method in which funding impacts were not realized until some twenty years later, no normal cost contributions were made for previous personnel. Consequently, the MRS had "an initial unfunded accrued liability...as of September 30, 1984 of $528.7 billion" (20:11).

A second provision requires the Treasury Department to make payments from general revenues to amortize the unfunded liability (20:1). These payments, as well as the normal cost payments, are transferred within the unified budget of the federal government into a trust fund, the military retirement fund.

The trust fund, in addition to the Treasury and DOD payments, has a third source of income that results from

> interest earnings on investments in [special issue] government securities made by the Treasury and the par values of the securities at maturity [20:22]

Furthermore, the "fund has two types of payouts: (1) payments to retirees and survivors of retirees, and (2) purchases of [special issue] U.S. Treasury securities" (20:22).

The management of the fund, which comprises the third major provision, is manifested by the Presidential appointment of an independent, three-member DOD Retirement Board of Actuaries.

> The Board is required to review valuations of the military retirement system, to determine the method of amortizing unfunded liabilities, to report annually to the Secretary of Defense, and to report to the President and the Congress on the status of the fund not less than [once] every four years. The DOD Office of the Actuary provides all technical and administrative support to the Board [20:1].

Members of the board are appointed for fifteen years and can be removed only for misconduct or failure to perform the duties of office. In addition, the DOD Chief Actuary is designated as the Executive Secretary for the Board (20:1).

Subsequent Effects of Accrual Accounting. In addition to its statutory impact, other effects resulted from Public Law 98-94. For example, accrual accounting as it applies to the MRS, as predicted by the Congressional Budget Office, has two advantages and two potential concerns.

The first advantage is the assurance that the Administration and Congress must immediately face the full costs of adding personnel or increasing military pay because legislation enacted in these areas affects deficit spending (4:x). An increase in either category increases deficit spending (a decrease reduces deficit spending). In contrast,

> [under] the pay-as-you-go method, the retirement expenses would not necessarily be considered in the initial decision since they would not show up for 20 years [20:24].

The second advantage is that accrual accounting allows

for evaluation of long range budgetary effects as a result of implementing changes to the present retirement system. "This [advantage] should avoid undue emphasis on immediate benefit cuts that offer short-term savings" (4:x). A corollary to this advantage is identified by the Headquarters Air Force Directorate of Personnel Plans, Entitlements Division.

> Accrual accounting allows immediate savings for changing retirement because [the normal cost contribution] is predicated on future benefits. Lowering future benefits lowers the [normal cost contribution], which lowers the amount of today's money flowing into the trust fund [12].

The first potential concern with accrual accounting is its sensitivity to technical assumptions about changes in future prices, wages, and interest rates. Different assumptions in these categories could produce different accrual charges to DOD, thus impacting the defense budget. This concern is alleviated by the DOD Retirement Board of Actuaries, which is required to periodically report the fund status to higher levels (4:x).

The second concern is that accrual accounting could confuse the issue of defense growth in real terms. This concern, however, "could be overcome by restating data on past defense budgets in accrual terms" (4:xi) in order to determine real defense growth.

It should be noted that the accrual accounting method has one important "non-effect." "Outlays in the total budget would remain unchanged, since accrual accounting does not affect the size of the benefits" (4:xi). That is to say,

the benefits, in monetary terms, remain as projected by the DOD Actuary under the original set of assumptions such as force size, retention rates, mortality rates, and economic conditions. Thus, the projected fiscal year retirement outlays the federal government incurs go unchanged under accrual accounting.

Current System. This description of the current MRS includes an overview, the categories of retirement pay, the special relationships, the privileges, and the magnitude of the MRS.

Overview. All four services, Army, Navy, Air Force, and Marine Corps, provide benefits under the same retirement system. The MRS, a funded noncontributory, defined-benefit plan, provides nondisability retired pay, disability retired pay, retired pay for reserve service, and survivor annuity programs. Nondisability retired pay at any age can be approved by the service Secretaries for any member credited with at least twenty years of active duty service. The same provisions generally apply for the reserve retirees, except the pay does not start until members reach sixty years of age (20:A-2).

Depending on the time period individuals enter into service, three separate benefit formulas comprise the payment structure of the MRS for retirees. Members who enter:

1. *Before September 8, 1980* receive retired pay equal to their terminal basic pay times a multiplier. The multiplier is 2.5 percent times the members' years of service. The multiplier is restricted to between fifty and seventy-five percent.

2. *On or after September 8, 1980* use the "high three" calculation for their terminal basic pay. This calculation consists of the average of the highest thirty-six months (three years) of basic pay.

3. *On or after August 1, 1980* are also subject to a penalty for retiring with less than thirty years of service. As mandated by the Military Retirement Reform Act of 1986, the penalty reduces the multiplier by one percentage point for each year not served under thirty years. The retired pay is recomputed and provided without the penalty at age sixty-two.

In addition to the above provisions, no vesting occurs before retirement (20:A-2).

Craig points out a unique aspect of the retirement process:

> What is often overlooked, is that the current statutory service requirement is 30 years of active duty. Service members do not have a right to retire after 20 years, but only to request retirement and transfer to a reserve status. In practice, however, virtually all requests for early retirement are granted routinely [7:6].

Once members are granted approval to retire and receive pay, the purchasing power of their benefits is protected. The Office of the Actuary (DOD) describes this "cost-of-living" adjustment (COLA):

> Retiree and survivor benefits are automatically adjusted annually to protect the purchasing power of initial retired pay. The benefits associated with members first entering the Armed services before August 1, 1986 are adjusted by the percentage increase in the average Consumer Price Index (CPI). This is commonly referred to as full CPI protection. Benefits associated with members entering on or after August 1, 1986 are annually increased by the percentage change in the CPI minus one percent. At the military member's age 62 the benefits are restored to the amount that would have been payable had full CPI protection been in effect. However, after this restoral, partial indexing (CPI minus 1%) continues annually [20:A-2].

While retired pay is "inflation-protected," it is not exempt from federal income tax.

Categories of Pay. Nondisability, disability, reserve, and survivor benefits are the four categories of retirement pay disbursed each fiscal year.

Nondisability. The present MRS allows nondisabled members to voluntarily apply for retirement after twenty years of service. The amount of pay is determined with respect to the appropriate benefit formula under which members qualify based on their service entry time frame.

An illustration using the multiplier technique to determine a member's retirement pay proceeds as follows. A member is retiring with 25 years of service having entered after August 1, 1986. His terminal basic pay, the average of the highest thirty-six months basic pay, equals $2000 per month. The resulting retirement pay is computed below:

Multiplier:				
2.5% X Years of Service	2.5	X	25 =	62.5
Penalty:				
1.0% X Years Short of 30	1.0	X	5 =	5.0
Adjusted Multiplier:				
Multiplier - Penalty (%)	62.5	-	5.0 =	57.5
Retirement Pay:				
Terminal Basic Pay (Avg of high 36 months)				$ 2000
Adjusted Multiplier				X 57.5%
Retirement Pay per Month				$ 1350

Table 1 shows the multipliers that are available for use in the computation of retirement pay.

Table 1

Military Retirement System
Multipliers

Years Served	Multipliers (%) Member Enters Before 1 Aug 86 No Penalty	Member Enters After 1 Aug 86 1% Penalty for Each Year under 30
20	50.0	50.0 - 10.0 = 40.0
21	52.5	52.5 - 9.0 = 43.5
22	55.0	55.0 - 8.0 = 47.0
23	57.5	57.5 - 7.0 = 50.5
24	60.0	60.0 - 6.0 = 54.0
25	62.5	62.5 - 5.0 = 57.5
26	65.0	65.0 - 4.0 = 61.0
27	67.5	67.5 - 3.0 = 64.5
28	70.0	70.0 - 2.0 = 68.0
29	72.5	72 5 - 1.0 = 71.5
30	75.0	75.0 - 0.0 = 75.0

Disability. Disabled military members with disability of at least thirty percent as determined under the Veterans Administration (VA) standard schedule are entitled to disability retirement pay according to one of the

following:

1. The member has eight years of service.
2. The disability results from active duty.
3. The disability occurs in the line of duty during war or national emergency or certain other time periods (20:A-3).

The MRS pays the disabled member retired pay based on the larger of: (1) the accrued nondisability retirement benefit, or (2) the base pay multiplied by the rated percent of disability. As with nondisabled members, the pay for disabled members cannot exceed seventy-five percent of basic pay, and the disabled members are covered by the three benefit formulas described previously. In addition to these provisions, members with non-permanent disability are temporarily retired with pay as if permanently retired; however, a physical examination is required every eighteen months to reassess the disability. This process terminates with a final determination of disability status within five years (20:A-3).

In addition, disability members who enter service after August 1, 1986 are subject to the Military Reform Act of 1986. Under this act, the cost of living adjustment is recomputed as the annual change in the Consumer Price Index minus one percentage point. At age sixty-two, retired pay is recomputed to what it would have been prior to the law (12).

Reserve. Members of the reserve may retire after twenty years of service provided the last eight years

are served in a reserve component. The computation of pay is similar to that of active duty members; however, reserve retired pay is not payable until age sixty. Another difference is that the years of service are calculated by a point system where a maximum of 360 points constitute one year of service. The point system is further explained by the DOD Actuary:

> Typically, a point is awarded for a day of service or a drill attendance, with 15 points being awarded for a year's membership in a Reserve Component. A creditable year of service is one in which the member earned at least 50 points. A member cannot retire without 20 creditable years. However, points earned in non-creditable years are eventually used in the retirement calculation [20:A-4].

The reservists are also affected by the Military Retirement Reform Act of 1986. Like the disability retirees, a one percentage point penalty is subtracted from the Consumer Price Index. A one time "catch-up adjustment" is performed at age 62 to recompute pay to what it would have been prior to the act (12).

Survivor Benefits. A small portion of the MRS is devoted to the Survivor Benefit Plan. Members can elect to participate in this plan in which surviving spouses and/or children receive the higher of two annuity plans.

The first annuity plan is a two-tiered benefit that is initially 55 percent of the base amount chosen by the member. The base amount is restricted between $300 and the member's full retired pay. The maximum base amount is equal full retired pay without penalty for retiring with less than 30

years of service. The second tier takes effect at age 62 when the annuity is reduced to 35 percent of the base amount. Survivor benefit plan participants, active personnel, and reserve personnel with twenty years or more of service were "grandfathered" into this annuity plan (20:A-4,A-5)

Prior to the enactment of the two-tiered plan on September 21, 1972, the survivor annuity was integrated with Social Security. As mentioned, survivors can receive the higher annuity provided by these plans (20:A-5).

Finally, it should be noted that "[members] who die on active duty with over 20 years of service are assumed to have retired on the day they have died" (20:A-5).

Relationships. A summary of how the MRS relates to the VA and other federal service, as well as how the MRS retired pay relates to military compensation, follows.

VA Benefits. VA benefits that provide compensation for service connected and non-service connected disabilities can be paid in lieu of or in combination with MRS retirement pay. These VA benefits are not additive to the MRS retirement pay, but they may offer federal income tax advantages over MRS retired pay. In addition, VA benefits overlap survivor benefits (20:A-6).

Other Federal Service. The MRS does not credit other federal service for retirement purposes, except where cross-service transferability is allowed. However, military service is generally creditable toward the federal civilian retirement--if the military retirement pay is waived.

Furthermore, a deposit equal to a percentage of post-1956 basic pay must be made to the civil service retirement fund. Except for reservists and certain disability retirees, military service is not generally creditable under both the military and civilian systems.

Relationship of Retired Pay to Military Compensation. The service members' basic pay is the only portion of basic military compensation for which retired pay is determined. The DOD Actuary defines basic military compensation:

> Basic pay is the principal element of military compensation which all members receive; but it is not representative, for comparative purposes, of salary levels in the public or private sectors. Reasonable comparisons can be made, however, to basic military compensation (BMC) or regular military compensation (RMC). BMC is the sum of basic pay, the quarters allowance (either cash or in kind), a subsistence allowance (either cash or in kind), and the Federal tax advantage accruing to allowances, since they are not subject to Federal income tax. RMC is BMC plus the average variable housing allowance (which varies by location) and the additional tax advantage it brings. Basic pay represents approximately 77% of BMC or 73% of RMC for all retirement eligibles [20:A-7].

The DOD Actuary further explains the relationship as basic pay applies to the retiree:

> For the 20-year retiree, basic pay is approximately 76% of BMC or 71% of RMC. Consequently, a 20-year retiree may be entitled to 50% of basic pay, but only 38% of BMC or 36% of RMC. For a 30-year retiree the corresponding entitlements are 75% of basic pay but only 59% of BMC or 56% of RMC. These relationships should be considered when military retired pay is compared to compensation under other retirement systems [20:A-7].

Privileges. The present MRS offers numerous military base facility privileges such as use of open messes,

commissaries, exchanges, libraries, theaters, and recreational facilities. These benefits are provided to nondisability retirees normally under the provision that active duty members have first priority (10:Chapter 17). Although important to the retiree, these privileges have not attracted substantial consideration for cost reduction.

Magnitude. A myriad of statistics is available concerning the overall MRS. The following list contains selected statistics that reveal the magnitude of the MRS:

1. Under the present MRS, the lump-sum equivalent of the annual retirement pay can range from $100,000 for junior enlisted personnel with 20 years service to over $1,000,000 for senior officer personnel with over 30 years of service [3:xi].

2. The Fifth Quadrennial Review of 1980 indicated an actuarial liability (as of 30 September 1980) of $523.3 billion for the present value of future benefits (23:10).

3. Retirement pay outlays increased from $1,014,775,000 in 1963 to $15,931,850,000 in 1983 (22:10-11). In 1978, a Presidential commission also predicted that costs will increase from $10 billion to "$30 billion plus in the year 2000" (25:177). However, this rise fails to account for rising costs as a whole as exemplified by: "today's [1978] family income of $10,000 will be $36,000 in the year 2000 (25:177). Indeed, MRS costs in then-year dollars are rising, but as exhibited by Figure 1, the MRS costs as a percent of the total military payroll are predicted to decrease.

4. The following figures are from the DOD Actuary:

    a. In fiscal year 1986, 1.1 million nondisability retirees from active duty were paid $14.4 billion (20:A-3).

    b. In fiscal year 1986, 139,000 disability retirees were paid $1.4 billion (20:A-3).

    c. In fiscal year 1986, 118,000 surviving families were paid $614 million (20:A-5).

Additional statistics can be found in the Appendix B.

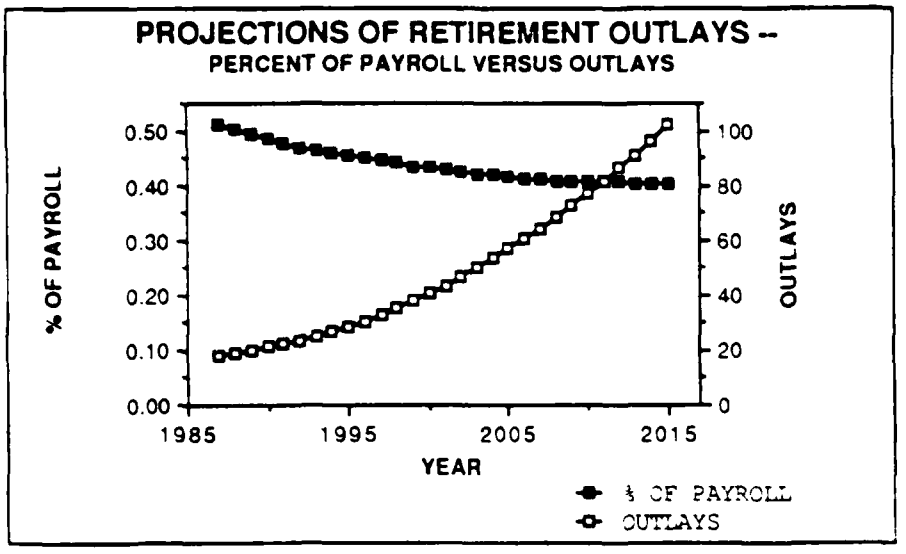

Figure 1. Projections of Retirement Outlays and Retirement Outlays as a Percent of Total Basic Payroll

Issues. As shown, the MRS is a system that incurs a growing responsibility to a large group of retiring members. The Congressional Research Service reports that "[this] large population stems from World War II and from U.S. policy...to maintain large standing forces to defend its security interests" (5:62). The Congressional Budget Office also suggests that the growth can be attributed to annual military pay raises, to which retirement pay is tied, and faster increases in retired pay as compared to the Consumer Price Index (3:8). Furthermore,

> For the 20-year period, fiscal year 1980-fiscal year 2000, projections show that the number of military retirees and survivor annuities will increase between 46 to 51 percent. By fiscal year 2000, the number of retirees and survivors annuitants will approximate 2 million, almost duplicating the size of the active duty forces today [April 1983]. The number of survivor annuitants is expected to grow at the fastest pace: from about 66,000 to around 221,000 to 223,000--a 235- to 238-percent increase.
>
> ...[From] fiscal year 1960 to fiscal year 1980 the budget for the military retirement system grew faster (+1600 percent) than the total DOD budget (+252 percent) [5:62].

Although the outlays for MRS are increasing, the percentage of retirement outlays versus the total outlays of DOD has decreased since fiscal year 1980 (5:62) and, is projected to continue decreasing (see Figure 1). Furthermore, the outlays are projected to grow at a rate of 1.1% through the turn of the century as compared to the rate of 7.0 since 1963 (3:8). In addition, the fastest growing category, survivor benefits, is the smallest portion of the total DOD outlays; hence, a large increase here does not have the same magnitude as an increase in nondisability retirement.

Nevertheless, the MRS continues to impose a funding liability on the federal budget, and, indeed, the large numbers associated with the MRS generate controversy. Much of the controversy is generally founded upon the relative generosity of the MRS, the uniqueness of the profession, and the retention aspect associated with the MRS.

Generosity. Opponents of the current MRS contend that the system can sustain large cuts and still remain

comparable to other federal and civilian programs for similar workers. Medlin says that the "MRS is indeed generous and should be modified to ... substantially reduce costs for the taxpayer" (17:ii). The Congressional Budget Office claims that "it is generally agreed that the military retirement system provides more generous benefits than are available in most non-military plans" (3:xv). The President's Private Sector Survey on Cost Control, as reported by Medlin, explains the generosity issue with the following points: MRS allows lower retirement ages, higher benefit formulas, and complete inflation protection (17:11). Finally, O'Connor added a different aspect to this issue:

> Either the taxpayers are paying more than is necessary or the increasing cost of military pensions is siphoning off funds needed to maintain an adequate level of military preparedness [19:18].

Uniqueness of the Profession. The Department of Defense has conducted studies that propose potential reductions in benefits (3:xvii-xx), but the uniqueness of the profession must be taken into account according to Taylor (27:6). Taylor summarizes the Army Military Compensation Task Force findings by calling the military retirement unique because the military member's exposure to physical death is greater than the civilian's. In addition, the military member risks economic death if and when the member attempts to enter the job market after spending 20 years facing enemy fire (27:6).

Retention. In addition to the generosity and the uniqueness aspects, the retention of quality, trained personnel is an issue frequently argued.

> Proponents for change are focusing on the [retirement] system's perceived generosity and high cost. This preoccupation with potential savings has diverted attention from the more important concern of efficiency of the system in support of our national security objectives [7:8].

The Congressional Budget Office questions the claim that the present benefits of the military retirement system is a retention incentive (3:7), but some studies show that retention is a legitimate issue. Anderson and Emmerichs reported the following:

> The systemwide perspective shows three intuitive but previously unobserved effects stemming from a reduction in retired pay. First, the overall force becomes more junior. Second, turnover increases. Third, higher procurement and training costs tend to offset projected savings from the retirement system. Although these conclusions were expected, no previous model had been able to assess quantitatively and dynamically the effects of behavioral responses to a policy change [1:156].

Proposed Alternatives. The issues described above have prompted many groups to propose alternatives to the current benefits. For example, in 1984, the Congressional Budget Office conducted a study of four proposed alternatives: reduced annuity and early withdrawal, permanent half-COLA, modified half-COLA, and annuity at age 62 (3). Furthermore, numerous theses and essays have addressed alternative approaches to the MRS. The most prevalent methods in these proposals for cost reductions in the MRS include:

1. Changing the benefit formula. An example is the President's Private Sector Survey on Cost Control which proposes 1.6 percentage points per year of service with a maximum of 48 percent (3:40-41,44-45).

2. Changing the annuity base. For example computing the terminal base pay based on the highest sixty months of base pay is proposed by the President's Private Sector Survey on Cost Control. (3:40-41,44-45).

3. A two-tier provision whereby members with varying levels of years of service receive different annuity plans (3:40-41,44-45).

4. Different vesting schemes. Some plans propose vesting at the ten year point, while others propose vesting after twenty years of service. The Fifth Quadrennial Review of Military Compensation opts for lump-sum payments upon retirement (3:40-41,44-45); meanwhile, O'Connor investigates an income redistribution concept founded on personal economic indifference and time value of money (19).

5. Varying degrees of grandfathering that range from none at all to complete protection for current members (3:40-41,44-45).

6. Integration of Social Security (3:40-41,44-45).

7. Modified inflationary protection that limits full Consumer Price Index protection (3:40-41,44-45).

More detailed summaries of the recent major studies with proposed changes to the MRS are contained on Appendix C.

Interestingly, since the inception of accrual accounting methods, the efforts to propose different approaches to the MRS have appeared to diminish. However, in 1986, the Air Force contracted a study by the Unicon Corporation to investigate the economic assumptions used by the DOD Actuary in determining the normal cost percentage (the normal cost contribution expressed as a percentage of the total basic payroll). The study found that the DOD Actuary is relatively

conservative in its assumption for the real interest rate and "endorse[s] the use of social discount rates to calculate the current value of future [DOD] retirement pay" (6). The social discount rate "represents the opportunity cost of forgone private investments" (6:76) and generally falls between five and twelve percent (6:76-77).

The Headquarters Air Force Directorate of Personnel Plans generally agrees with the Unicon Research Corporation findings. However, the "DOD Actuary stands by the assumptions [and] agrees that the social discount rate is a valid theoretical concept, but one which is outside actuarial science" (14). Maj Greenberg, Entitlements Division of Personnel Plans, recommends that the interest rate issue be dropped because "Congress created an independent Board of Actuaries for a reason, and they have duly noted [AF] recommendations" (14).

Conclusion

The MRS is a traditional system that supports compensation to members who have honorably served for over 20 years. While the MRS has survived and prospered under steady legislative activity, groups continually conduct research to find additional cost reduction measures. Presently, a concensus among proposals is not apparent as numerous groups have raised differing issues of generosity, uniqueness, and retention. Perhaps there is no single, optimal solution to cost reductions in the MRS; however, a need remains for

continued research to insure that the system at hand is the best possible, under the current set of conditions, for retirees as well as taxpayers.

III. Methodology

Overview

The methodology employed in this study contains three areas that require amplification: mechanics of accrual accounting, approach to specific research question, and justification of the approach.

Mechanics of Accrual Accounting

Before describing the methodology pertaining to the specific research aspect of this study, an overview of the mechanics of accrual accounting as established by Public Law 98-94 is necessary. The organization of this overview contains the following topics:

1. An overview of the components of the trust fund portion of the unified budget.
2. A general explanation of the flow of revenues and transactions and how they relate to the components and the budget.
3. A review of the actuarial assumptions as they apply to the computation of retirement costs.

Unified Budget. The trust fund portion of the unified budget of the federal government as it applies to the MRS has five major components:

1. Normal Cost Payments. These payments are the accrual charges paid by DOD into the military retirement fund for retirement outlays. These charges are sometimes computed as a percentage of the total basic payroll and are called the normal cost percentage. Thus, the accrual charge can be expressed as 51.3 percent in fiscal year 1987 (20:16).

2. Unfunded Liability Payments. This stream of payments into the military retirement fund by the Treasury is amortized to eliminate the unfunded liability.

3. Payments of Interest and Par Value at Maturity. The purchase of the special issue securities yields interest as well as par value of the securities.

4. Special Issue Securities. Excess monies from the military retirement fund are used to purchase special issue securities from the Treasury.

5. Military Retirement Fund. The military retirement fund "is established on the books of the Treasury" and is administered by the Secretary of the Treasury (28:644).

Figure 2 illustrates the relationship of these components.

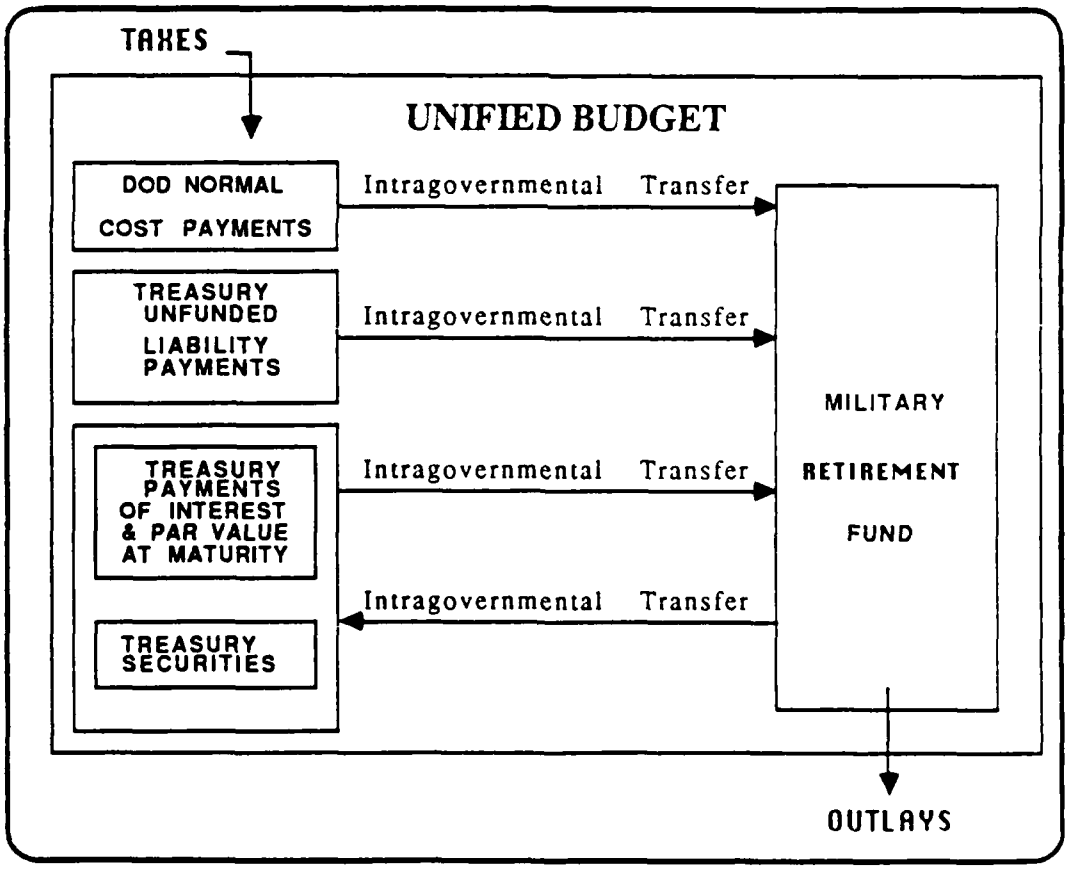

Figure 2. Unified Budget Activity (adapted from 20:23)

Flow of Revenues and Transactions. Revenues in the form of taxes that are received by the unified budget enable transactions that can be characterized by a series of debits and credits. The following list describes the flow of this series; in addition, the numbers on the list correspond to those depicted in Figure 3.

1. Taxes are received by the unified budget. The Treasury and DOD are credited as appropriate.

2. DOD Revenues marked for retirement, normal cost payments, are paid into the military retirement fund (debit).

   Treasury revenues marked for the retirement unfunded liability are paid into the military retirement fund (debit).

   The military retirement fund receives normal cost and unfunded liability payments (credit).

3. The military retirement fund pays retirees and survivors of retirees; this transaction is not intragovernmental (debit).

4. The military retirement fund purchases special issue U.S. Treasury Securities with excess funds available after payment to retirees and survivors (debit). The Treasury receives excess monies from the MRS fund for issuance of U.S. Treasury securities (credit).

   The Treasury pays interest and par value of securities at maturity to the military retirement fund (debit).

   The military retirement fund receives interest earnings and par values to the military retirement fund for outlays as well as the purchase of additional securities as excess money allows (credit).

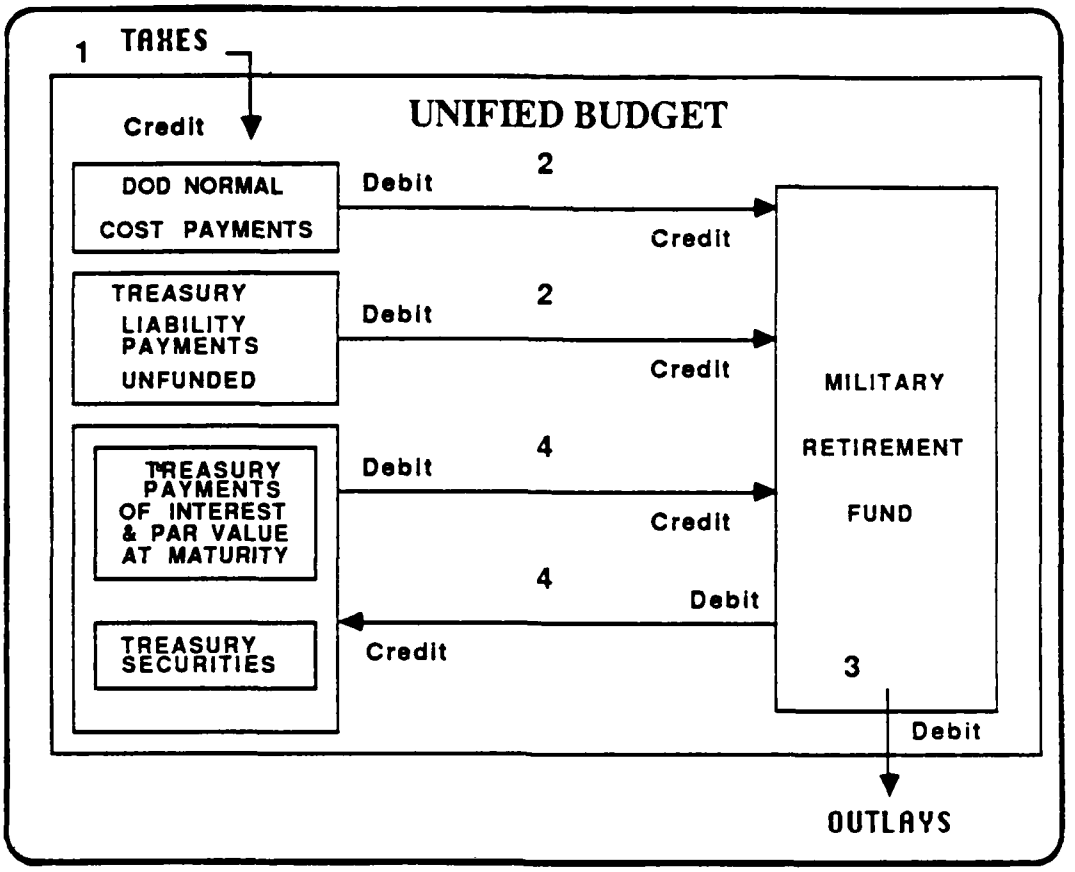

Figure 3. Unified Budget Activity with Credit/Debit Flow (adapted from 16,20:23)

The significance of these transactions is the impact on the federal deficit (spending in excess of the amount of revenue received in a given fiscal year). The intragovernmental transfers do not have a direct effect on the deficit because each has an offsetting credit or debit. However, the outlays to retirees, number three above, do affect the deficit because there is no offsetting credit

within the unified budget (16). Thus,

> [the] only transactions in a particular year that directly affect the deficit...are those which pass in and out of the government, such as tax collections and retiree or survivor payments [20:22].

In amplifying this deficit effect as it applies to MRS, the DOD Actuary illustrates:

> [1] If DoD debits $17 billion in normal cost payments, the fund credits the $17 billion -- net direct Federal budget deficit effect is zero.
>
> [2] If the fund purchases $7 billion in securities (debit) and the Treasury sells $7 billion in securities (credit) -- net direct Federal budget deficit effect is zero.
>
> [3] If the Treasury pays $700 million interest (debit) and the fund earns $700 million interest (credit) -- net direct Federal budget deficit effect is zero.
>
> [4] Disregarding all other government programs, if the government collects $15 billion in tax revenues (credit) and pays $17.3 billion to retirees (debit) -- net direct Federal budget deficit effect is $2.3 billion [20:22].

In addition to the deficit effect, the intragovernmental purchase of special issue U.S Treasury securities increases the national debt,

> specifically the portion held by the government. The portion of the debt held by the public will not change. However, the total debt will increase and this might require an increase in the statutory borrowing authority [20:24].

In addition, no surplus can be derived using military retirement fund money. For example,

> Suppose in the year 2000 the amount needed to pay retirees was $42.6 billion and the military retirement fund had grown to $423 billion. The following transactions would take place:

Fund cashes in $42.6 billion in securities (credit).

Treasury pays $42.6 billion to Fund (debit).

Net Federal surplus zero.

Since no budget surplus can be derived from using fund money, the government still has the need for $42.6 billion to pay retirees--the same need it would have under the pay-as-you-go system, and so a Fund cannot transfer liabilities from one tax year to another [20:24].

Actuarial Assumptions and Projections. In addition to mortality assumptions and retention rates, the DOD Actuary assumes several economic conditions for which projections are made concerning the MRS. The assumptions pertinent to this study are the annual rate of inflation and the annual investment return of the special issue securities, five percent and 6.6 percent, respectively, as of September 30, 1986 (20:iv). Subtracting the annual inflation rate from the annual investment return results in the "real interest rate," in this case 1.6 percent. This real interest rate will serve as the major criteria for which the private plans will be compared.

The real interest rate is the underlying assumption for the following categories of projections by the DOD Actuary:

1. DOD Total Basic Payroll. This projection assumes that future active duty and Reserve force strength will remain constant.

2. DOD Normal Cost Payments. These are the annual accrual charges.

3. Amortization of Unfunded Liability. The taxpayer liability includes this Treasury payment as well as the normal cost payments (16).

4. Investment Income. This income results from excess funds in the military retirement fund.

5. Fund Disbursements. These disbursements are done on a cash basis.

6. End of Year Fund Balance. "This fund balance (on a book value basis) reflects actual cash disbursements during the year" (20:17).

Appendix C contains the DOD Actuary's projections for the above categories.

Explanation of Approach to Research Question

The purpose of this research is to investigate whether investment in the private sector rather than through the intragovernmental purchase of special issue U.S. Treasury securities can result in a greater real interest rate. In addition, if the private sector investment results in a higher real interest rate, this study will illustrate the potential taxpayer savings in terms of the DOD normal cost payment each fiscal year.

To accomplish this research it will be necessary to define hypothetical budget activity, develop sample investment strategies in the private sector, compute real interest rates, compare results with existing data, and post assumptions.

Budget Activity. To invest revenues in the private sector, the unified budget activity as previously described must be altered such that some intragovermental transactions become extragovermental transactions. Thus, a budget that includes the private sector as well as an amended unified

budget would require actual money rather than simply credits and debits.

Figure 4 depicts hypothetical budget activity for researching possible investment of military retirement funds in the private sector. The budget activity includes extragovernmental transactions as well as an amended unified budget activity. The list below describes the changes and additions in budget activity that accommodates private sector investment of the MRS.

1. Because the newly added extragovernmental transfers require "actual" money, and because the government is operating with a deficit, the Treasury must sell U.S. Treasury securities to generate the additional revenue not generated by tax increases. As a consequence, the issuance of these securities increases the national debt.

2. The purchase of special issue Treasury securities with military retirement funds is replaced by private sector investment purchases. This transaction is extragovernmental; consequently, it is an outlay that affects the deficit.

3. Private sector investment incurs a commission and management fee for the management of the military retirement fund portfolio.

4. Payment of interest and par value at maturity requires the selling of private investment sector plans--not simply a credit to the military retirement fund.

5. Issuing Treasury securities to generate "actual" money (rather than credits as under the current system) for private sector investment purchases involves the payment of interest on these issues. The corresponding payments of interest on these Treasury securities require additional outlays from the budget. These outlays affect deficit spending.

Table 2 shows the relationship of the above changes and additions with the MRS under the existing unified budget.

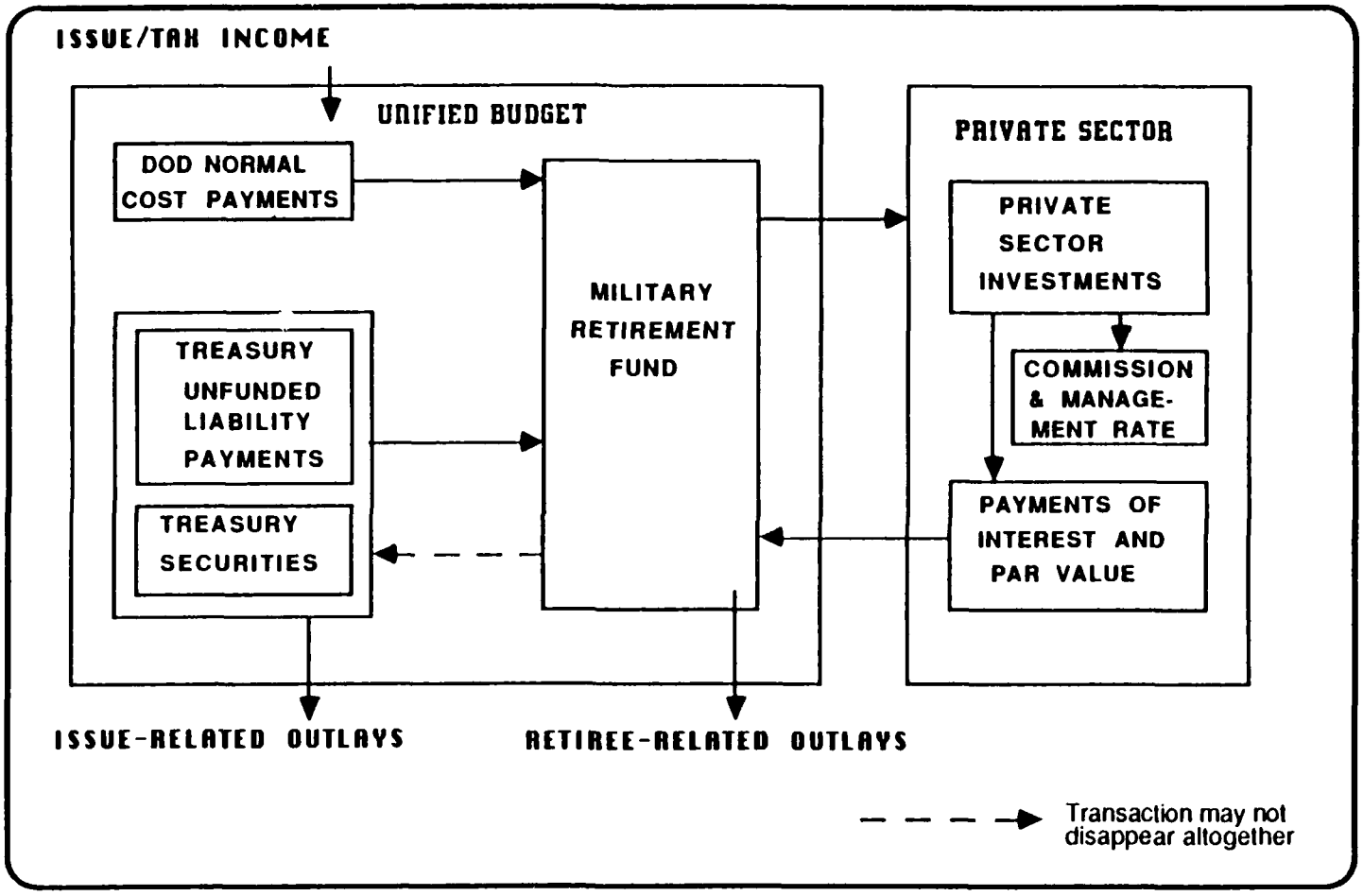

Figure 4. Hypothetical Budget Activity

Table 2

Existing Unified Budget Activity
versus
Hypothetical Budget Activity

Key: extra => extragovernmental
intra => intragovermental

Existing Transaction	Hypothetical Transaction
1. Taxes (extra)	1. Additional Taxes and Treasury Issue Income (extra)
2. DOD Normal Cost Payment (intra)	2. Same (intra)
3. Treasury Unfunded Liability Payment (intra)	3. Same (intra)
4. Purchase of special Issue Treasury Securities (intra)	4. Purchase Private Sector Portfolios (extra)
5. Treasury Payments of Interest/Par (intra)	5. Private Payments of Interest/Par (extra)
6. None	6. Commission and management (extra)
7. Outlays to Retirees (extra)	7. Same (extra)
8. None	8. Outlays to Private Sector for Interest on Treasury issues (extra)

In summarizing the hypothetical budget activity, the key concept is that the government must come up with actual cash to fund the MRS in the private sector. Because the government is operating with a deficit, the need for actual cash in turn requires the government to either sell U.S.

Treasury issues to the private sector or to raise taxes to generate the necessary funding. The acquisition of cash could also result from a combination of issues and taxes.

Investment Strategies. For this study, two types of historical information will be used to determine private sector investment strategies that are feasible in terms of real interest returns. The first type includes specific investments under one name. Such investment strategies will be gathered from literature and by consulting a nationally recognized investment brokerage firm. The investment plan derived from literature will be diversified, such as a mutual fund, and will have a historical base of several decades. Attention will be given to the plans with the highest and lowest yields respectively as well as the plan with the least variability in yield. The investment plan gained from consultation will be one specifically designed for retirement purposes.

The second type of investment plans will be broad-based, that is, combinations of several investment vehicles over several decades. These investment vehicles include common stocks, real estate, bonds, and other securities.

Computation of Interest Rates. After gathering the historical information as described above, the computation of interest rates involves a two-step process.

First, an "adjusted rate of return" will be derived. The basis for this rate is the respective nominal return of each investment plan during a defined period. Subtracted

from the nominal return will be an interest rate equal to the rate paid during the period by the Treasury for issuing securities to the private sector to fund the MRS. This subtraction is necessary because interest paid by the Treasury in effect nullifies a portion of the real interest gained by investing the MRS in the private sector.

For example, if the reader assumes that a private investment plan achieves a real rate of ten percent and the U.S Treasury issues used to finance the private investment incurs six percent interest, then the effective real interest rate for the MRS and the government is ten percent minus six percent, or four percent.

In addition, this U.S. Treasury rate used to finance private sector investment must be combined with any potential taxes legislated to also generate funding to MRS purchase of private sector investments. Thus, if only a portion of the funding is generated through U.S. Treasury issues, the Treasury rate for these issues can be reduced proportionally. This relationship can be illustrated if the reader assumes the following:

1. The Treasury issue rate is 6.0 percent.
2. A total principle of $5 billion is required to fund the private sector investment
3. Fifty percent of the principle is offset by additional taxes.

The resulting U.S. Treasury rate as a result of an offset by taxes is shown below:

(tax offset X principle) X (Treasury rate)

=> (.50 X $5 Billion) X (6.0 percent)

= ($5 Billion) X (.50 X 6.0 percent)

= ($5 Billion) X (3.0 percent)

Thus, the effective U.S. Treasury rate for those issues used to finance private sector investment of MRS funds is reduced proportionally to three percent. Furthermore, three percent is the only portion that is subtracted from the return achieved in the private sector.

The following combinations of U.S. Treasury issues and taxes necessary to generate funding will be investigated to show the sensitivity of the adjusted rate of return of the investment plans selected for this study.

1. 100% U.S. Treasury security issues/0% Taxes
2. 50% U.S. Treasury security issues/50% Taxes
3. 0% U.S. Treasury security issues/100% Taxes

In addition to the nominal rate and the U.S. Treasury rate, a commission and management rate, a constant throughout the study, will be subtracted. This combined rate will correspond to the costs of purchasing, selling, and managing the private sector investments. Thus, the adjusted rate of return can be expressed as the following equation:

Nominal Rate of Return of Plan	_	Commission and Management Rate	_	Rate Paid to Purchasers of Treasury Securities	=	Adjusted Interest Rate of Plan

After the adjusted interest rate is determined, the real interest rate will be computed by subtracting the respective rate of inflation for the period of each investment plan. The following equation represents the real interest rate:

Adjusted Interest Rate of Plan	_	Rate of Inflation for Period	=	Real Interest Rate of Plan

If the inflation rate is not readily available for the plans used in this research, changes in the Consumer Price Index (CPI) will be used as an approximate measure of the inflation rate. This measure of inflation is used by the DOD Actuary and will be computed for one period (year) as follows:

$$\frac{CPI_{n} - CPI_{(n-1)}}{CPI_{(n-1)}} \times 100\% = \text{Inflation Rate for Period}$$

Computation of the overall inflation rate will be the average change over the number of years corresponding to the plan at hand.

In summary, a private sector plan has to, as a minimum, achieve a real interest rate greater than the 1.6 percent assumed by the DOD Actuary. In doing so, however, the investment plan must account for the Treasury issue rate and commission and management rate as well as inflation.

Comparison of Results. Once the real interest rate is determined for each plan, the feasibility of each plan will be checked by using the real interest rate currently assumed by the DOD Actuary. If a plan's real interest rate is less than 1.6 percent (20:iv), then the plan will be deemed infeasible and will be removed from further consideration.

If feasibility exists, then the hypothetical amount of savings a plan might achieve will be determined by using a special relationship derived from an actuarial projection model (GORGO). The relationship is that a 0.2 percent increase (decrease) in real interest rate results in a $1 billion decrease (increase) in the DOD normal cost payment (16,13).

By dividing the change in real interest rate by 0.2, the quotient reveals the potential savings in billions that could be achieved. Subtracting the quotient from the DOD normal cost payment also shows the hypothetical DOD normal cost payment.

An example of the "0.2 relationship" would proceed as follows:

Real Return:

Investment Plan Real Return	3.0
MRS Real Return	- 1.6
Increase in Return	1.4 %

Potential Savings: $\frac{1.4\ \%}{0.2\%\ \text{per}\ \$1\ \text{billion}} = \$7\ \text{Billion}$

Determining a cost ratio in the base year of 1987 will allow for the computation of subsequent years. The ratio consists of the following:

$$\frac{\text{Hypothetical DOD Normal Cost Payment}}{\text{Base Year DOD Normal Cost Payment}}$$

Multiplying this ratio by the outyear DOD normal cost payments will give the respective outyear hypothetical DOD normal cost payments.

In addition to determining the savings of a feasible investment plan, research will be devoted to associating a quantitative risk factor with feasible investment plans. Expressing the risk as a quantity will provide an approximate method for comparing the respective risks of the investment plans.

For this study, risk will be considered a function of the variability of the nominal rates of return of the investment plans; thus, the standard deviation associated with a sample of nominal returns provides a basis for variability and approximate risk assessment (2:27). Furthermore, the coefficient of variation, the standard deviation divided by the mean of the sample, will provide a "normalized risk factor" for which the investment plans can be compared. If data is not available for computing such a quantitative risk factor for a particular investment plan, the risk will be assessed through consultation with an

investment management firm.

Assumptions. In performing this research to determine whether the MRS can be funded through private sector investments, several assumptions are required. This research assumes the following:

1. DOD Actuary projections of the DOD normal cost payments and the real interest rate assumption remain constant.

2. The amortization of the unfunded liability (Treasury payments) is not an acceptable criteria for the comparison of costs because offsetting factors within the actuarial projection models rule out any appreciable gain or loss from any adjustment in the real interest rate (16).

3. DOD Actuary amortization schedule and "75-year projection of basic pay and benefit disbursements" remains constant (20:17).

4. The U.S. government operates with deficit spending.

5. The U.S. government is a low risk investor.

6. Historical nominal return rates are the most appropriate indicators available for the potential or possible performance of the investment plans used in this research.

7. Variability measured by the standard deviation of a sample yield from an investment plan gives a measure of risk.

8. An investment firm will manage the investment of military retirement funds; therefore, a commission and management rate is required.

9. Private sector investment plans under management by a professional management firm can include government securities in the MRS portfolio.

Justification of Approach

The approaches used in this research have been discussed with authorities in the area of military retirement as well

as in the area of investment plans. The hypothetical budget activity, the adjusted interest rate calculation, and the comparison of results were discussed in person and by telephone with the DOD Chief Actuary (16,15) and personnel from the Headquarters Air Force, Directorate of Personnel Plans, Entitlements Division (12). The investment approaches were discussed during interviews with members of Prudential-Bache Securities Incorporated and Dean Investment Associates, both of Dayton, Ohio (18,26). In addition, the DOD Chief Actuary recommended researching investment plans with histories that span several decades. Using plans of this nature helps to smooth the effect of perturbations on the annual rates of return (16).

IV. Discussion of Results

Overview

This discussion of results concerning investment of military retirement funds in the private sector under hypothetical budget activity includes findings and analysis for selected investment plans and their respective rates of return. After the relevant results are reported, a final section is devoted to general observations from authoritative sources in military retirement and private investment.

Findings

The findings in this research consists of two areas. The first area reports the various investment plans used to test the hypothetical budget. The second area provides the results of computing the respective interest rates of the selected plans.

Investment Plans. Within the selection of investment plans, there are two types of plans : specific and broad-based.

Specific Investment Plans. Two of the plans researched in this category are mutual funds associated with a study conducted by Brown and Brown (2:28). The funds identified are the Investment Company of America and the Investors Selective Fund, Incorporated. The Investment Company of America, a growth and income fund, recorded the highest mean annual nominal return, 12.05 percent, among

thirty-two funds studied from the period 1947 to 1978. In contrast, the Investors Selective Fund, an income fund, posted the lowest mean annual nominal return, 5.25 percent, as well as the lowest variability in the same time frame. A complete listing of all the funds in the study by Brown and Brown is contained in Appendix D.

The other plan researched in the specific category is from Dean Investment Associates, an investment management firm. This association, which manages over $800 million for its clients (26), deals almost exclusively in retirement accounts. The composition of the overall account can be described in descending order of risk: equity (common stocks), balanced-aggressive, balanced-moderate, balanced-conservative (8:8). From the period of 1978 to 1986, the overall mean annual nominal return of the association was 16.6 percent (compiled from 8:7). The plan's quarterly return data is contained in Appendix E.

Broad-based Investment Plans. In contrast to the specific plans noted above, two broad-based plans composed of several investment entities were researched. Because of the cosmopolitan nature of these plans, a more detailed description is provided as well as the respective returns.

The Wyatt Company Survey. The results of this survey conducted by The Wyatt Company using IRS 1500 reporting forms, as reported by the Unicon Research Corporation, are shown in Table 3. The first column shows "the percentage distribution of plan holdings, on average,

across a few basic categories of assets" (6:27). The second column gives the annual nominal yields on roughly corresponding assets (in parentheses) which are computed as averages of annual data reported in *Economic Report of the President*, 1986 (6:27-28). The Standard and Poor's nominal returns, however, are calculated "as the yearly dividend-to-price ratio plus the annual relative change in the Standard and Poor's composite" index as contained in the same economic report (6:27). The total in column two "represents a crude estimate of the average nominal yield for the typical portfolio over the period 1953 to 1985" (6:27-29).

Table 3

Portfolio Composition and
Estimated Rates of Return, 1953-1985
(adapted from 6:28)

	Percent Composition	Nominal Return (%)	
Cash	8.1	0.0	
U.S. Long-Term	11.6	6.6	(10-Year T-Bond)
Municipals/U.S. Short-Term	1.0	5.4	(3-Month T-Bill)
Corporate	14.4	7.1	(Moody's AAA Bonds)
Stock	35.1	11.1	(Standard and Poor's)
Trusts, Insurance Contracts, Other	29.7	7.1	(Moody's AAA Bonds)
TOTAL	100.0	7.8	(Average Return)

Indexing. The other broad-based plan concerns the formulation of separate market proxies as outlined by Brown and Brown in "Does the Composition of the Market Portfolio *Really* Matter?" (2). To create the proxies, Brown and Brown use historical returns and market values gathered by Ibbotson and Fall for the thirty-two year period of 1947 to 1978. Listed below are five major classes of securities, as defined by Ibbotson and Fall and reported by Brown and Brown, that are used in the proxies:

1. Common stocks, including NYSE, AMEX, and OTC equities.

2. Fixed-income corporate issues, including preferred stocks, intermediate- and long-term bonds, and commercial paper.

3. Real estate, including the USDA aggregate market value of farm investments and residential housing aggregate values (excluding urban land values) assembled from estimates of net rental yields and an index of capital appreciation.

4. United States government issues, including Treasury bills, notes, and bonds, as well as government agency securities.

5. Municipal bonds, including both state and local, and short- and long-term bonds [2:27].

Each of the above securities are combined by Brown and Brown to create market proxies as explained below:

> [We] began...by including only the returns to common stock. We then added the other securities incrementally to form an increasingly broader portfolio. In each case, the annual market values were used to provide the percentage weighting that a security class would receive in the portfolio that year. We then multiplied these weights by the annual returns to each asset and added them to create a value-weighted index [2:27].

The resulting indexes are shown in Table 4.

Table 4

Six Market Proxies (adapted from 2:27)

Index	Composition
1	Common Stock
2	Index 1 plus fixed-income corporate issues
3	Index 2 plus real estate
4	Index 3 plus United States government issues (Bills, Bonds, Notes)
5	Index 4 plus municipal bonds
6	Index 5 less common stock
Risk-free	Treasury Bills

Brown and Brown also provide a statistical summary of the indexes which is contained in Table 5. The coefficient of variation in the final column "standardizes the variability" so that the various index risks can be compared. While it does not take into account the specific nature of the investment vehicle, the coefficient of variation is a general measure of risk; thus, as it increases, the risk as well as reward increases. For example, because of its greater variability away from its mean return, Index 1 is roughly three times riskier than Index 6. The reader should note that Brown and Brown consider the Treasury bill rate to be "risk-free" (2:27)

Table 5

Statistical Summary of
Market Indexes,
1947-1978 (adapted from 2:27)

	Mean Return (%)	Standard Deviation (%)	Coefficient of Variation
Index 1	11.79	17.73	1.50
Index 2	9.07	13.62	1.50
Index 3	8.26	5.63	0.68
Index 4	7.25	4.71	0.65
Index 5	6.97	4.58	0.66
Index 6	6.08	2.88	0.47
Risk-free Rate	3.53	2.07	0.59

Another example, Figure 5, graphically depicts the concept of variability using a low risk index, Treasury bills, and a high risk index, Standard and Poor's 500. The Standard and Poor's 500 nominal return curve shows abrupt changes as well as periods of "negative growth." In contrast, the Treasury bill's nominal return curve shows little fluctuation and no negative growth. Thus, in terms of variability, the Standard and Poor's displays a greater risk potential than the Treasury bills. Although potentially riskier, the Standard and Poor's does show the possibility of annual gains over forty percent. The Treasury bills shows a stability in return rates that is not likely to experience gains as exhibited by the higher index.

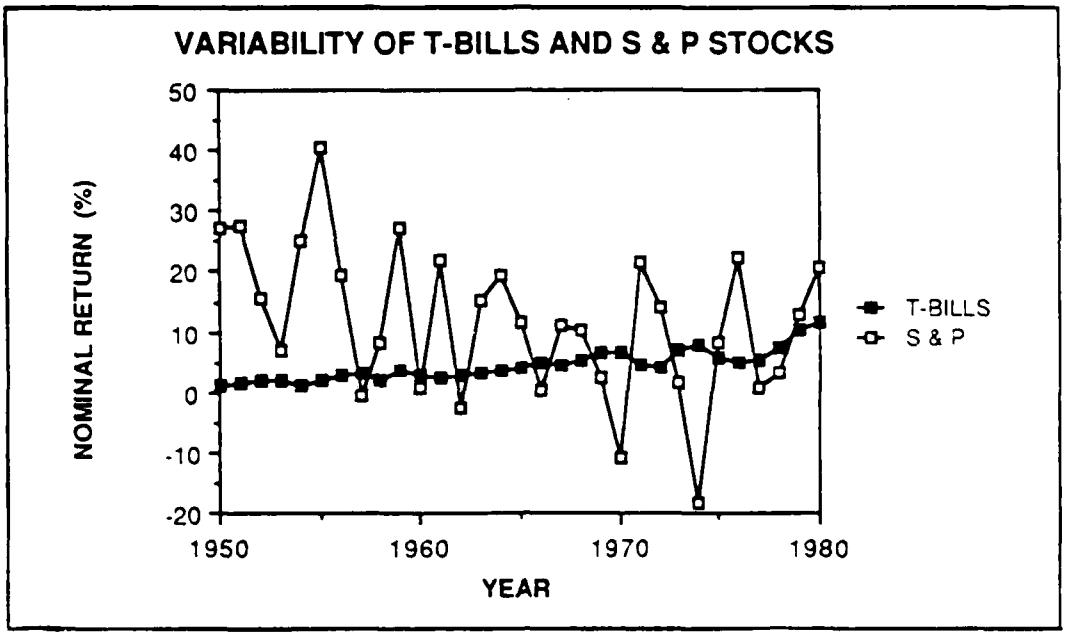

Figure 5. Variability of Nominal Returns of a High Risk Index, S & P 500, and a Low Risk Index, Treasury Bills, 1950-1980 (compiled from 24:308,335)

Summary of Investment Plans. Before progressing to the calculations of real interest rates, below is a review of the pertinent elements necessary for an investment plan to be a viable candidate to replace the present intragovernmental investment currently used by the MRS. Following the pertinent elements is an identification system of the plans previously discussed. This identification system will be used in the remainder of the study.

The first element is that a plan must show a competitive annual real interest rate when compared to the real interest rate of 1.6 percent currently assumed by the DOD

Actuary. In particular, all distracting factors such as inflation, commission and management, and any interest incurred by Treasury securities that are issued to generate "actual" money for the MRS, must be subtracted from the plan's nominal return. Thus, after removing the distracting factors, the real interest rate of the plan is revealed.

Secondly, a plan's real interest rate must exceed the actuarial interest rate enough to show an appreciable decrease in the DOD accrual charge. Plans with a rate only slightly better than the presently assumed rate are susceptible to statistical error and, thus, cannot be considered viable candidates.

The final element is that a plan should possess a limited amount of risk. Although the element of risk is difficult to fully define and assess, for this study the notion of risk is considered a function of the variability and composition of the investment plan. While the amount of reward a plan can produce is tied to its risk, a plan for the MRS must show reasonable gains in real return as well as being competitive with the essentially risk-free nature of the present MRS.

To facilitate further computations and analysis, the investment plans described previously are numbered as indicated in Table 6. Data associated with the current military retirement system is designated by *MRS*.

Table 6

Summary and Designation of Investment Plans

Plan Number	Time Frame	Composition or Name
1	1947-1978	Index 1: Common Stock
2	1947-1978	Index 2: Index 1 plus fixed-income corporate issues
3	1947-1978	Index 3: Index 2 plus real estate
4	1947-1978	Index 4: Index 3 plus U.S. government issues
5	1947-1978	Index 5: Index 4 plus municipal bonds
6	1947-1978	Index 6: Index 5 less common stock
7	1947-1978	Risk-free Rate (T-Bills)
8	1947-1978	The Investment Company of America
9	1947-1978	Investors Selective Fund, Inc.
10	1953-1985	Wyatt Company Survey
11	1976-1986	Dean Investment Associates

Real Interest Rates. As noted previously, the real interest rate is a result of subtracting inflation rates, commission and management rates, and Treasury issue rates *from the nominal return of an investment plan.* The results of computing the real interest rate for each investment plan corresponding to outlays that are generated entirely from U.S. Treasury issues is contained in Table 7. Thus, the full rate of interest paid for the Treasury sales is subtracted from

each plans' nominal return. This combination is designated as *100% Issues/0% Taxes*.

In addition, Figure 6 is a graphical depiction of the real interest rates. Because of the subtractions previously noted, Plans 5, 6, 9, and 10 show a negative real return. The MRS real interest rate is also included for comparative purposes; it has no relation to the issue/tax combination.

Table 7

Real Return Rates (%) -- 100% Issues/0% Taxes

Plan	Time Frame	Avg Annual Nominal Return	Inflation Rate	Comsn and Mgmt1	Treas Issue Rate 2	Real Return
MRS	Current	6.60	5.00	--	--	1.60
1	1947-78	11.79	3.50	.38	3.53	4.39
2	1947-78	9.07	3.50	.38	3.53	1.67
3	1947-78	8.26	3.50	.38	3.53	0.85
4	1947-78	7.25	3.50	.38	3.53	0.15
5	1947-78	6.97	3.50	.38	3.53	-0.43
6	1947-78	6.08	3.50	.38	3.53	-1.32
7	1947-78	3.53	3.50	--	--	0.03
8	1947-78	12.05	3.50	.38	3.53	4.65
9	1947-78	5.25	3.50	.38	3.53	-2.15
10	1953-85	7.80	4.52	.38	6.00	-3.10
11	1973-86	16.60	7.10	.25 3	8.40	0.85

1 -- From consultation with investment management firm (26)
2 -- 1947-78 (2:27), 1953-85 (compiled from 6:28), 1973-86 (8:7)
3 -- Commission already subtracted from nominal return (26)

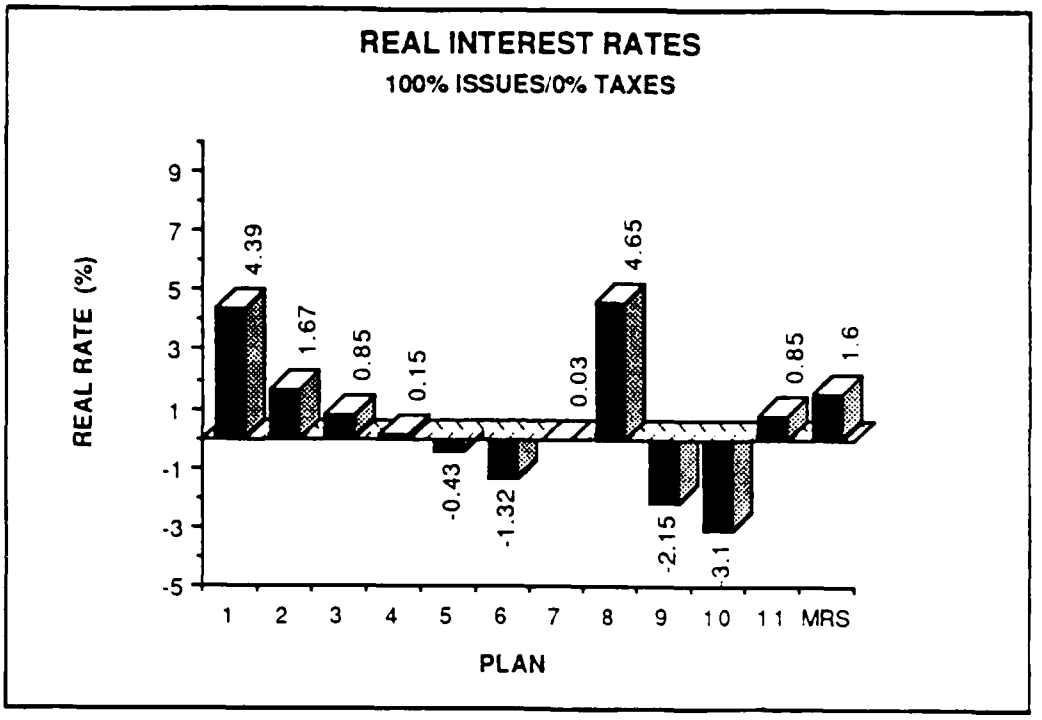

Figure 6. Real Interest Rates of Investment Plans--
100% Issues/0% Taxes

Table 8 shows the rates as a result of adjusting the Treasury issue rate proportionally to reflect fifty percent of the revenue generated by Treasury issue sales, and the remaining fifty percent generated by a tax increase. For example, the U.S. Treasury has to generate only half as much revenue through issues if taxes account for the other half; thus, if the issue rate is 3.53 percent, the Treasury, in effect, only has to pay half of this rate, so the rate subtracted from the nominal return need only be 1.77 percent. The designation of this combination is 50% *Issues*/50% *Taxes*.

Table 8

Real Return Rates (%) -- 50% Issues/50% Taxes

Plan	Time Frame	Nominal Return	Inflation Rate	Comsn and Mgmt1	Treas Issue Rate 2	Real Return
MRS	Current	6.60	5.00	--	--	1.60
1	1947-78	11.79	3.50	.38	1.77	6.15
2	1947-78	9.07	3.50	.38	1.77	3.43
3	1947-78	8.26	3.50	.38	1.77	2.62
4	1947-78	7.25	3.50	.38	1.77	1.61
5	1947-78	6.97	3.50	.38	1.77	1.32
6	1947-78	6.08	3.50	.38	1.77	0.43
7	1947-78	3.53	3.50	--	--	0.03
8	1947-78	12.05	3.50	.38	1.77	6.41
9	1947-78	5.25	3.50	.38	1.77	-0.40
10	1953-85	7.80	4.52	.38	3.00	-0.10
11	1973-86	16.60	7.10	.25 3	4.20	5.05

1 -- From consultation with investment management firm (26)
2 -- One half of the rate during the periods 1947-78 (2:27), 1953-85 (compiled from 6:28), 1973-86 (8:7)
3 -- Commission already subtracted from nominal return (26)

The real interest rates of investment plans under the 50% Issues/50% Taxes combination are shown graphically in Figure 7 below. Only Plans 9 an 10 show a negative real return on this graph.

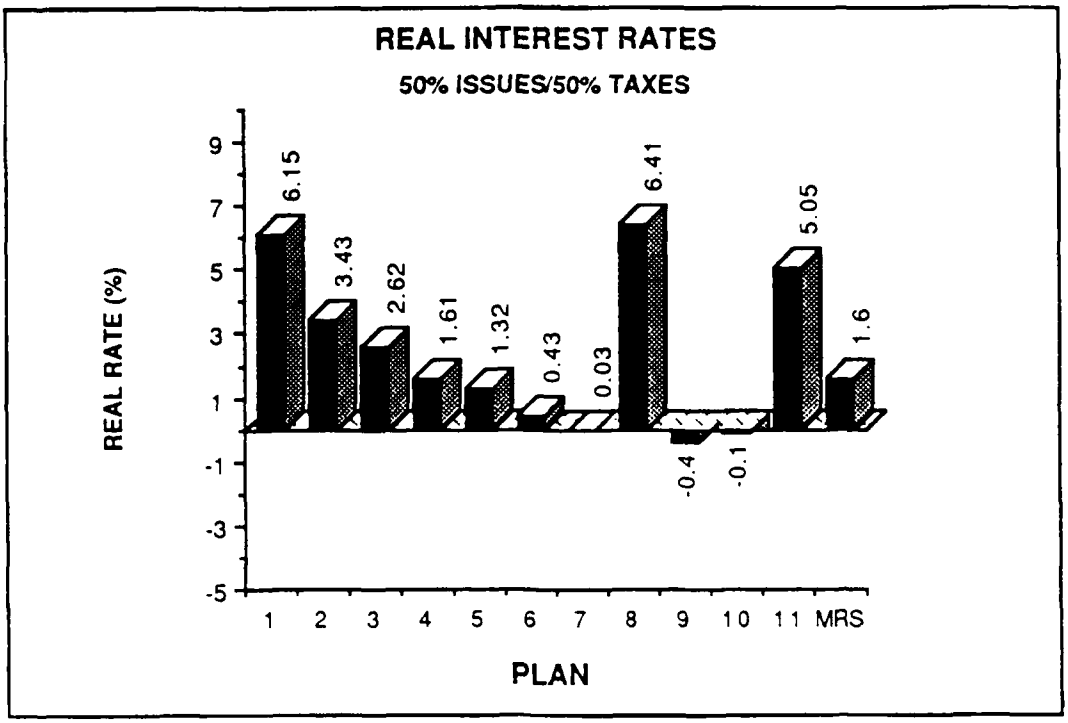

Figure 7. Real Interest Rates of Investment Plans--
50% Issues/0% Taxes

Table 9 reveals the real interest rates of the investment plans under the prospect that revenue for the MRS is generated entirely by a tax increase and no Treasury issues to the private sector. Consequently, this combination has the effect of eliminating the subtraction of the Treasury rate from the nominal rate of the investment plans. This final combination of U.S. Treasury issues and taxes is designated by *0% Issues/100% Taxes*.

Table 9

Real Return Rates (%) -- 0% Issues/100% Taxes

Plan	Time Frame	Nominal Return	Inflation Rate	Comsn and Mgmtl	Treas Issue Rate 2	Real Return
MRS	Current	6.60	5.00	--	--	1.60
1	1947-78	11.79	3.50	.38	0.00	7.92
2	1947-78	9.07	3.50	.38	0.00	5.20
3	1947-78	8.26	3.50	.38	0.00	4.39
4	1947-78	7.25	3.50	.38	0.00	3.38
5	1947-78	6.97	3.50	.38	0.00	3.10
6	1947-78	6.08	3.50	.38	0.00	2.21
7	1947-78	3.53	3.50	--	--	0.03
8	1947-78	12.05	3.50	.38	0.00	8.18
9	1947-78	5.25	3.50	.38	0.00	1.38
10	1953-85	7.80	4.52	.38	0.00	2.91
11	1973-86	16.60	7.10	.25 3	0.00	9.25

1 -- From consultation with investment management firm (26)
2 -- Treasury rate not required under the combination of 0% Issues/100% Taxes
3 -- Commission already subtracted from nominal return (26)

A graphical representation of the real interest rates is provided below in Figure 8. As shown on the graph, all investment plans under this issue/taxes combination exhibit positive returns.

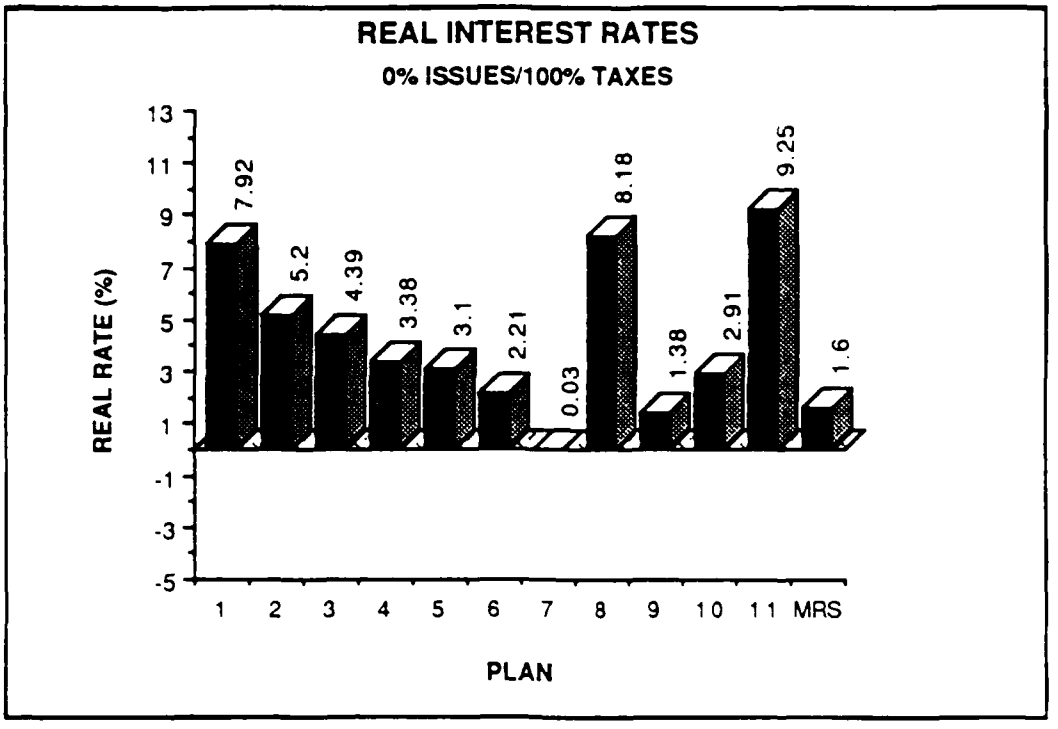

Figure 8. Real Interest Rates of Investment Plans--
0% Issues/100 Taxes

Analysis

This analysis is composed of three major sections. The first section decribes relative risks associated with the investment plans. The second section, divided according to the three issue/tax combinations, concerns the feasibility and the implications of the investment plans. The final section contains some general observations.

Relative Risks of the Investment Plans. It is important to put some measure of risk on the selected investment plans, especially when one considers the "risk-free" environment of the present MRS. Although there may not be one absolute

measurement of risk, a crude method has been employed for this analysis by using a quantitative measure, the coefficient of variation of the mean annual returns, and by using advice from investment firms. Thus, for this research, risk will be divided into three categories: high, moderate, and low. Table 10 summarizes these risk assessments as they apply to each plan, as well as showing the coefficients of variation.

High Risk. Strictly in terms of the coefficient of variation, as shown in Table 10, Plans 1, 2, 8, 9 and 11 exhibit approximately two to three times more variability than Plan 7, the risk-free rate of Treasury bills. Thus, these plans are potentially the riskiest, and when one considers the high percentage of stocks in these plans, the higher degree of risk is further reinforced (26).

Moderate Risk. Plans 3, 4, and 5, in terms of variability, are less riskier than Plans 1, 2, 8, 9, and 11. These plans possess a relatively low coefficient of variation; however, their composition which includes common stock, real estate, corporate securities, and municipal bonds imparts a higher degree of risk than a plan only composed of government securities. Under this rationale, Plans 3, 4, and 5 are considered moderately risky in this study.

The reader should note that Plan 6 has a lower coefficient of variation than Plan 7, the risk-free rate, yet it is considered moderately risky. The reason for this assessment of risk is based on composition of Plan 6. Plan 6

includes assets such as fixed-income corporate securities, as well as government issues. As noted in Table 10, adding fixed-income corporate securities to Index 1 does not reduce its high variability; therefore, Plan 6, which contains a high risk vehicle such as real estate, can be considered more risky than a plan composed solely of government issues. Thus, when one considers composition, Plan 6 can be termed moderately risky.

Plan 10 is also considered moderately risky. Specific return rates were not available to determine the coefficient of variation, but its composition gives insight to its risk element. Over 83 percent of its assets, to include over 35 percent stock, are devoted to assets other than government securities (6:28); thus, Plan 10 is considered at least moderately risky.

Low Risk. As mentioned earlier, Brown and Brown consider Plan 7, composed only of Treasury bills, as a risk-free index. Therefore, in this study, Plan 7 as well as the MRS, are considered low risk.

Table 10 summarizes this study's assessment of the relative risks associated with the investment plans. Unfortunately, information was not readily available concerning the coefficients of variation for Plan 10, the Wyatt Company survey, and the MRS. However, as mentioned earlier, assessments of the relative risks for Plan 10 and the MRS were made based on the composition of the plans.

Table 10

Investment Plan
Coefficients of Variation

Plan	Time Frame	Coefficient of Variation of Mean Nominal Return	Relative Level of Risk
MRS	Current	--	Low (20:D-2)
1	1947-1978	1.50	High
2	1947-1978	1.50	High
3	1947-1978	.68	Moderate
4	1947-1978	.65	Moderate
5	1947-1978	.66	Moderate
6	1947-1978	.47	Moderate
7	1947-1978	.59	Low
8	1947-1978	1.41	High
9	1947-1978	1.10	High
10	1953-1985	--	Moderate
11	1973-1986	1.17	High

Figure 9 is a graphic depiction of the coefficients of variation of the investment plans.

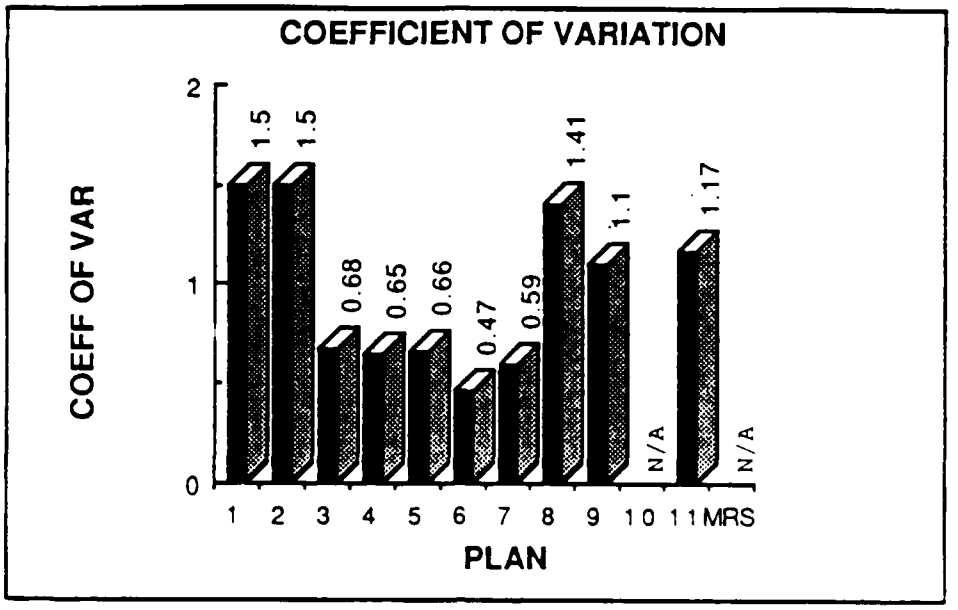

Figure 9. Coefficients of Variation Associated with Investment Plans

Issue/Tax Combinations. Within each of the three issue/tax combinations, the analysis concerns feasibility, comparison of accrual charges under each feasible plan, effect on the national debt, effect on deficit spending, and implications based on risk and other intangible considerations.

100 Percent Issues/0 Percent Taxes. The first area of analysis is the combination that relies entirely upon revenue raised by Treasury issues; therefore, the full effect of the Treasury issue rate is subtracted from the nominal interest rate.

Feasibility. In this combination, only three plans, 1, 2, and 8, show feasibility by exceeding the real interest rate, 1.6 percent, assumed by the DOD Actuary

(20:iv). The remaining plans, 3, 4, 5, 6, 7, 9, 10, and 11, failed to better the 1.6 percent rate. Figure 10 shows the amount of real interest each feasible plan exceeds the real interest return of the MRS (a complete listing of all real interest rates is contained in Table 7).

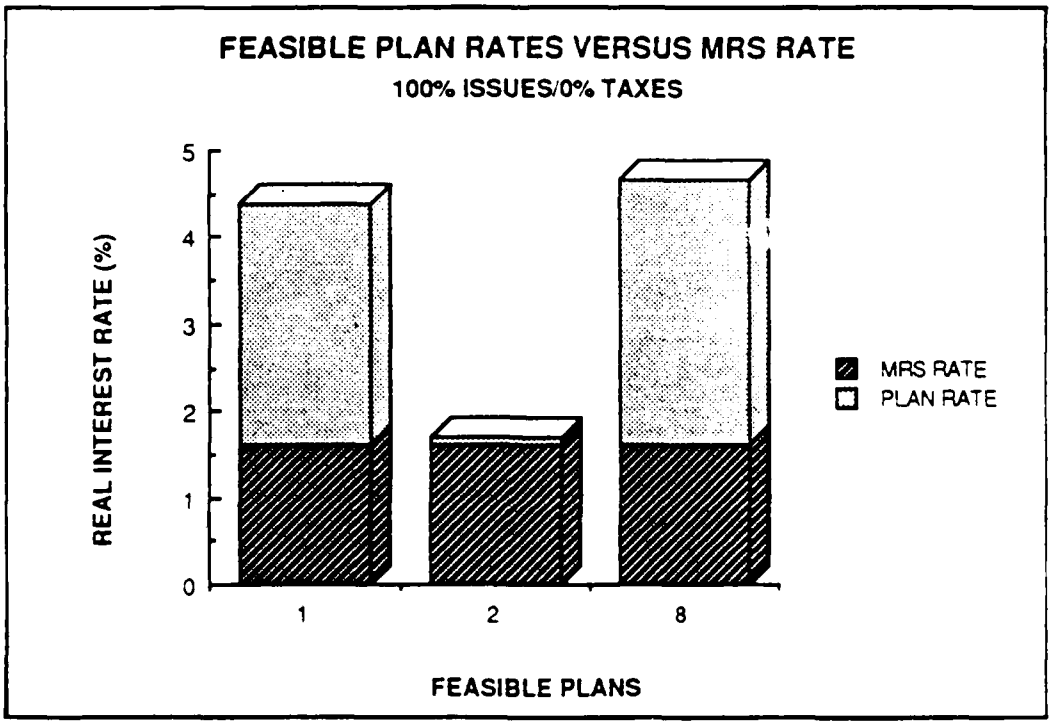

Figure 10. Feasible Plan Real Return Rates versus MRS Real Return Rate--100% Issues/0% Taxes

Comparison of Accrual Charges. Table 11 shows the potential change in accrual charges under the three feasible plans as compared to the 1987 accrual charge, $18.8 billion, of the present MRS (20:16). In addition, Appendix F contains outyear accrual charges computed for each feasible investment plan.

Table 11

Feasible Plan Accrual Charges ($ Billions)--
100% Issues/0% Taxes

Plan	Relative Risk	Accrual Charge (1987 Dollars)	Change in Accrual Charge
MRS	--	18.80	--
1	High	4.85	13.95
2	High	18.45	0.35
3	Moderate	Infeasible	--
4	Moderate	Infeasible	--
5	Moderate	Infeasible	--
6	Moderate	Infeasible	--
7	Low	Infeasible	--
8	High	3.55	15.25
10	Moderate	Infeasible	--
11	High	Infeasible	--

Plans 1 and 8 reveal the most significant cost impacts for 1987 as shown in Figure 11, which displays the accrual charges of the feasible investment plans. The current MRS accrual charge is also included for comparison of the investment plans.

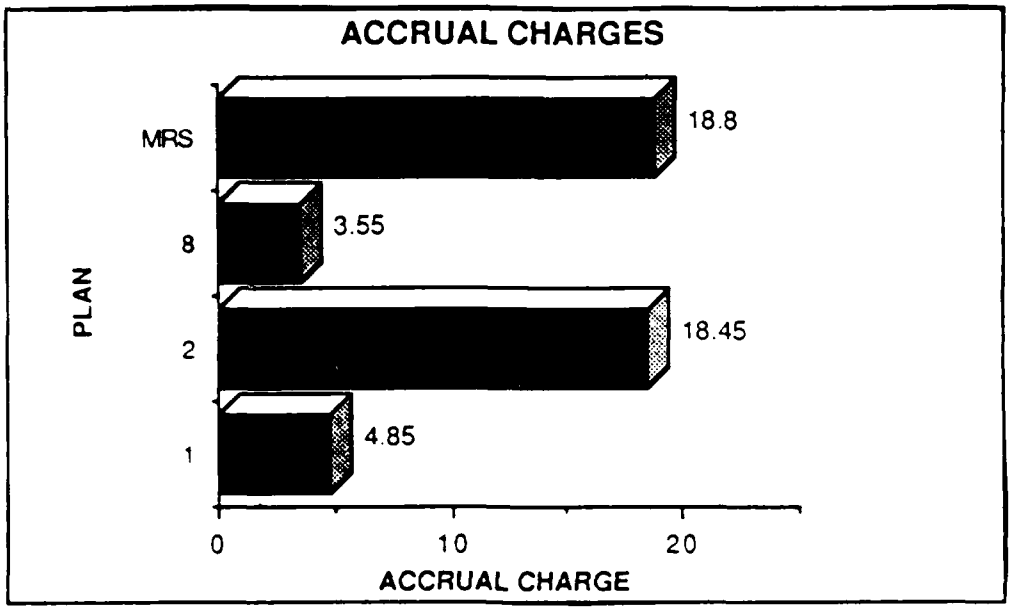

Figure 11. Accrual Charges for Feasible Plans (1987)--
100% Issues/0% Taxes

Effect on National Debt. This issue/tax combination has the most impact on the national debt. The national debt would be increased by the amount of the accrual charge as well as the obligatory interest on the issues used to finance the purchase of private sector investment.

Effect on Deficit Spending. If the Treasury securities issued can not account for the entire amount necessary to fund the purchase of private securities, then deficit spending will increase to account for the lack of funds. The deficit spending increase would equal the difference in the accrual charge and the amount of revenue raised through Treasury security issues. This deficit amount could be as much as $18.45 billion annually under Plan 2.

Risk Implication. All three plans exhibit a high coefficient of variation and, thus, more risk than associated with the present MRS.

Intangible Implications. As mentioned previously, this issue/tax combination relies entirely on receiving revenue from Treasury issues. Therefore, the U.S. government must have a market for as much as $18.45 billion annually if an investment plan like Plan 2 is undertaken. If the amount necessary is not raised, then existing revenue must be earmarked by Congress to ensure that money is available for investment in the private sector as well as outlays to retirees and survivors of retirees. In the presence of deficit spending, it would be difficult to predict what priority the MRS would have with respect to other programs. Under these circumstances, it is conceivable the MRS could go unfunded.

50 Percent Issues/50 Percent Taxes. Under the 50% Issues/50% Taxes option, only half of the Treasury rate is subtracted from the nominal returns.

Feasibility. For this combination, Plans 1, 2, 3, 8, and 11 show a feasible real interest rate as compared to the current system rate of 1.6 percent (see Table 8). Plan 4 combination is not considered feasible because its rate is only within .01 of MRS real rate; hence, it is susceptible to statistical error. Figure 12 displays the feasible plan real return rates as they compare to the current MRS real return rate of 1.6 percent.

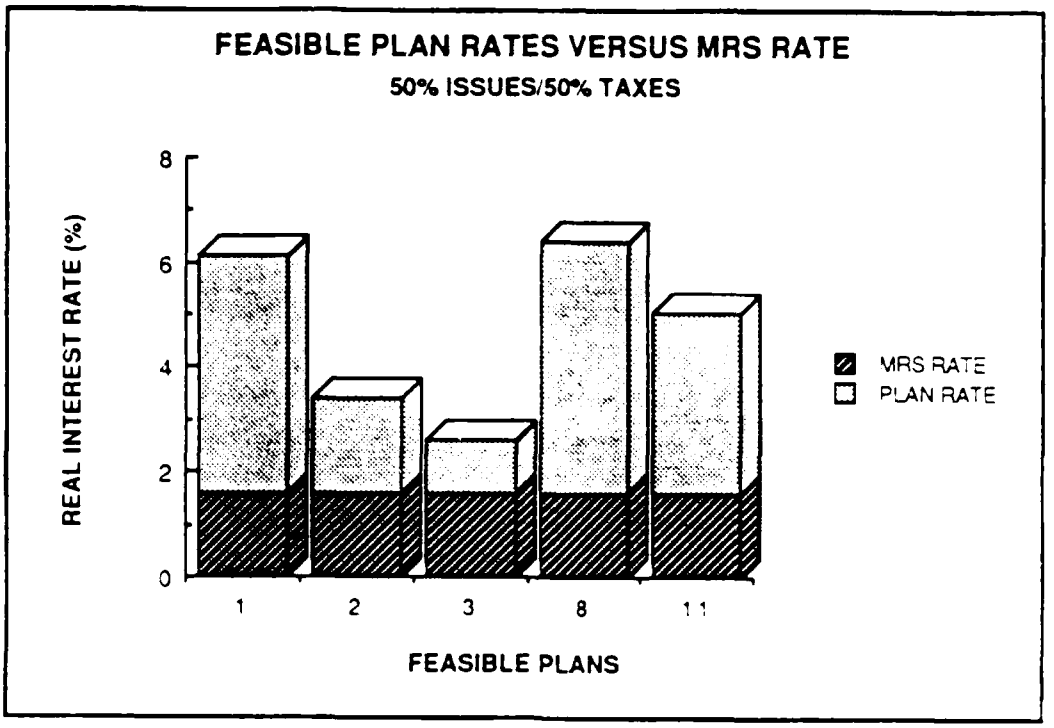

Figure 12. Feasible Plan Real Return Rates versus MRS Real Return Rate-- 50% Issues/50% Taxes

Comparison of Accrual Charges. Table 11 shows the potential change in accrual charges attributed to the investment plans. Interestingly, using the idea that a 0.2 percent increase in real interest rate produces a $1 billion reduction in the annual accrual charge, Plans 1 and 8 "eliminate" the accrual charge as shown by the zeros in column 3 of Table 11. Therefore, the present actuarial schedule of payments must be readjusted, or "re-amortized," to determine a suitable payment schedule.

Table 11

Feasible Plan Accrual Charges ($ Billions)--
100% Issues/ 0% Taxes

Plan	Relative Risk	Accrual Charge (1987 Dollars)	Change in Accrual Charge
MRS	--	18.80	--
1	High	0	Re-amortize
2	High	9.65	9.15
3	Moderate	13.70	5.10
4	Moderate	Infeasible	--
5	Moderate	Infeasible	--
6	Moderate	Infeasible	--
7	Low	Infeasible	--
8	High	0	Re-amortize
9	High	Infeasible	--
10	Moderate	Infeasible	--
11	High	3.05	15.75

Figure 13 graphically depicts the accrual charges of the feasible plans under the 50% Issues/50% Taxes combination. In addition, Appendix G shows the outyear accrual charges for the feasible investment plans under the 50% Issues/50% Taxes combination.

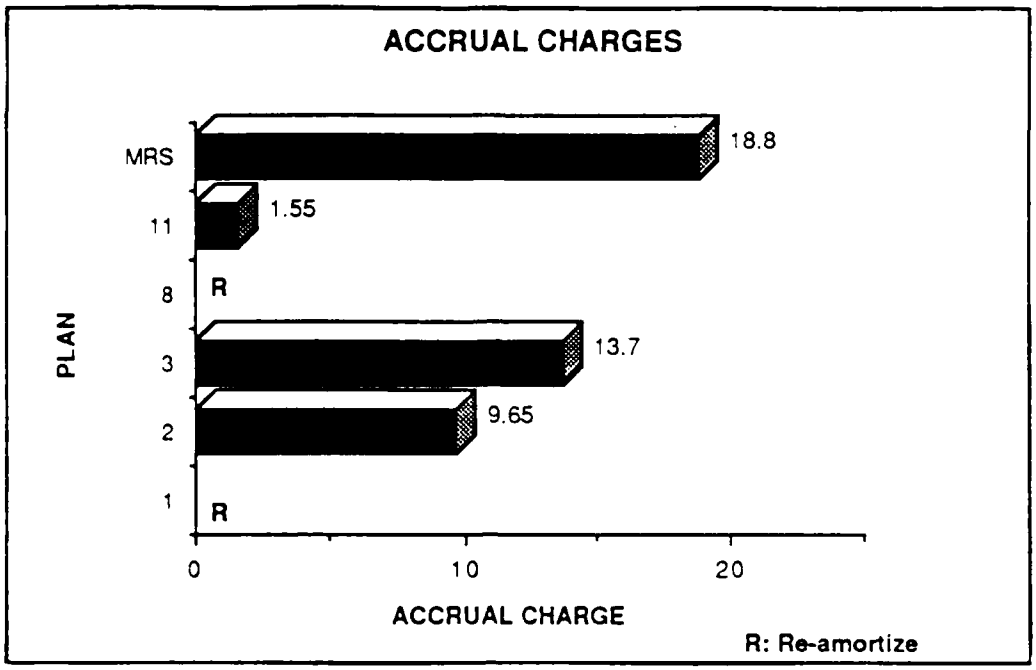

Figure 13. Accrual Charges for Feasible Plans (1987)--50% Issues/50% Taxes

Effect on National Debt. The national debt is only impacted half as much under this issue/tax combination; thus, a maximum of fifty percent of the accrual charge plus Treasury issue interest would be added to the debt.

Effect on Deficit Spending. Provided fifty percent of the revenue necessary is generated by Treasury issues, and the other fifty percent is accounted for by additional taxes, this combination has a smaller impact on deficit spending. Nonetheless, the deficit could be as much as $6.85 billion, or half of the accrual charge of Plan 3, if all the necessary Treasury issues are achieved.

Risk Implications. Plans 1 and 2 continue to pose a risky nature as well as Plan 11. Although Plan 3 has a relatively low coefficient of variation, it possesses more risk than the present MRS because of its composition of common stock, real estate, and fixed-income securities, but no government securities.

Intangible Implications. As well as requiring a market for as much as $6.85 billion annually, it would be necessary under this issue/tax combination for legislation authorizing a tax increase to generate the other $6.85 billion necessary to fund the MRS. In addition, under plans such Plans 1 and 8, a shorter schedule of payments puts the military trust fund under increased risk from short-term fluctuations in the private sector. Finally, while this issue/tax combination shows several potential private sector investment plans that could possibly fund the MRS and reduce the accrual charge paid by DOD, the savings are not ultimately any better for the taxpayer because of the tax increase.

0 Percent Issues/100 Percent Taxes. For this issue/tax combination, no Treasury rate is subtracted from the nominal rate.

Feasibility. Plans 1, 2, 3, 4, 5, 6, 8, 10, and 11 are all feasible under this issue/tax combination. Only Plans 7 and 9 do not surpass the 1.6 percent DOD actuarial assumption (see Table 9). The real return rates of the feasible plans and the MRS are contained in Figure 14.

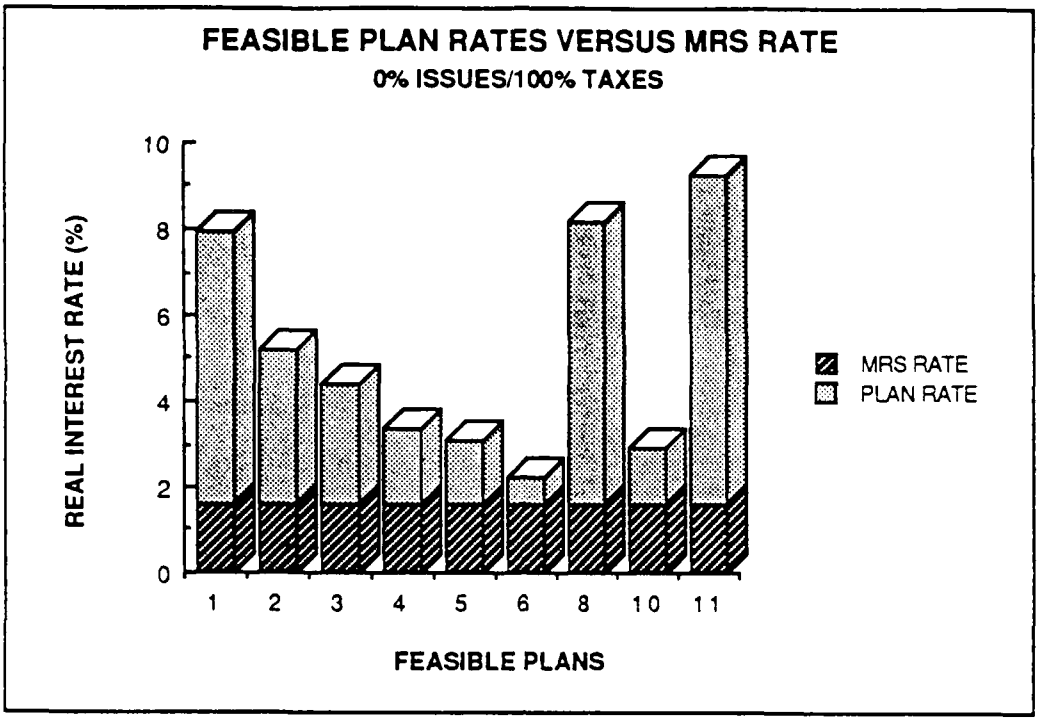

Figure 14. Feasible Plan Real Interest Rates versus MRS Real Return Rate-- 0% Issues/100% Taxes

Comparison of Accrual Charges. Similar to the 50% issues/50% taxes combination, Plans 1, 8, and 11 require a new amortization schedule. Other plans, such as Plans 3, 4, 5, 6, and 10, offer substantial changes in the accrual charge as shown in Table 13.

Figure 15 illustrates the comparison of accrual charges for the nine feasible plans as well as the MRS. Only Plan 7, strictly Treasury bills, and Plan 9, the Investors Selective Fund, Inc., are omitted for infeasibility. In addition, Appendix H contains the outyear accrual charges for the feasible plans under the 0% Issues/100% Taxes combination.

Table 13

Feasible Plan Accrual Charges ($ Billions)--
100% Issues/0% Taxes

Plan	Relative Risk	Accrual Charge (1987 Dollars)	Change in Accrual Charge
MRS	--	18.80	--
1	High	0	Re-amortize
2	High	.82	17.98
3	Moderate	4.85	13.95
4	Moderate	9.92	8.88
5	Moderate	11.32	7.48
6	Moderate	15.77	3.03
7	Low	Infeasible	--
8	High	0	Re-amortize
9	High	Infeasible	--
10	Moderate	12.25	6.55
11	High	0	Re-amortize

Effect on National Debt. Provided that taxes generate all the revenues necessary to fund the entire accrual charge, this issue/tax combination does not affect the national debt. The national debt would increase, however, if taxes do not fulfill the required amount and Treasury securities are issued.

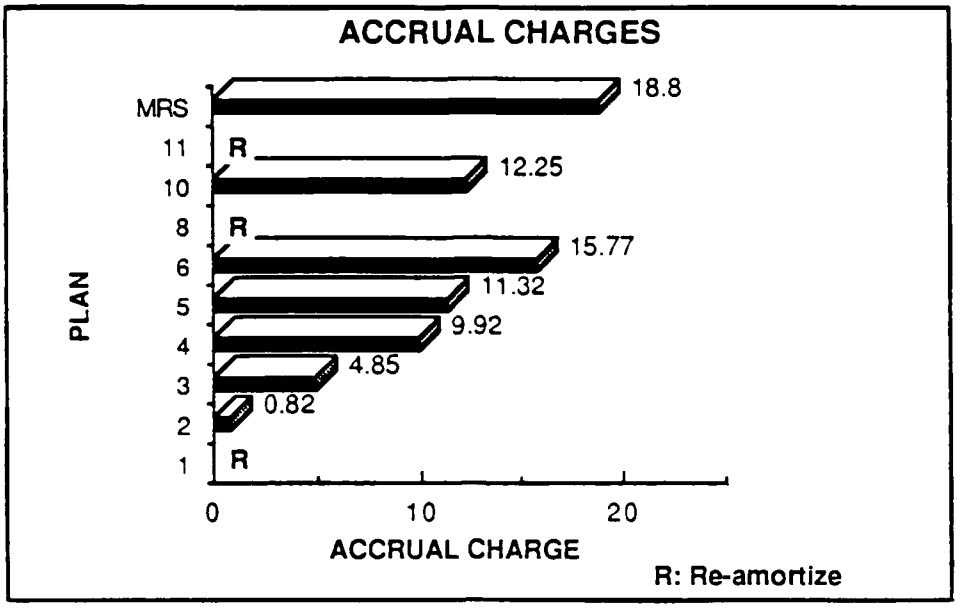

Figure 15. Accrual Charges for Feasible Plans (1987)--0% Issue/100% Taxes

Effect on Deficit Spending. Like the national debt, if taxes are able to provide all the revenue necessary, deficit spending is not increased under this issue/tax combination. However, if taxes fall short, then Treasury issues would be necessary to compensate for the shortfall, otherwise deficit spending would increase provided funding was earmarked for the MRS.

Risk Implications. While many of the plans exhibit lower coefficients of variation and thus lower susceptibility for risk, none of the plans can match the virtually riskless environment under which the MRS presently functions.

Intangible Implications. Although the 0 percent issues/100 percent taxes combination effectively eliminates the need for a large market for the purchase of government securities, it requires congressional action to raise as much as $15.77 billion through tax legislation. In view of deficit spending, concensus on this legislation would indeed be difficult. Furthermore, while the DOD would potentially pay a smaller accrual charge, the savings is not passed on to the taxpayers.

eneral Observations.

This section outlines some overall observations that must be considered if such a private sector investment approach to accrual accounting for the MRS is undertaken. The observations are primarily from the DOD Office of the Actuary and from representatives in investment management positions.

DOD Actuary Observations. As noted previously, the MRS is contained within the unified budget and insomuch the

> excess monies in the [MRS] fund are intragovernmental transfers. If the fund was not held by the government all excess monies would be direct Federal expenditures, impacting the deficit [16].

Treasury issues, tax hikes, or their combination could potentially avoid the deficit spending aspect. However, no funding change at all under the private sector approach means that

> [moving] the [MRS] trust fund out of the federal budget would increase the Federal Deficit by $25 billion immediately and another $12 billion each year in the future [16].

The $25 billion is the combined cost of the DOD accrual charge and the Treasury unfunded liability payment.

In addition the DOD Actuary points out that

> The fundamental structure of the private sector investment market has radically changed over the last generation due to the increasing amount of pension assets. Adding a large government pension fund to the private sector market would create further changes that are unknown...[16].

In addition, adding a government pension fund the size of the MRS would impose a philosophical difficulty of a substantial government interest in the private and corporate activity in the U.S. Furthermore, the government interest in the private sector "would be at risk depending on the market situation" (16).

Another philosophical issue arises. The DOD Actuary explains that

> The Federal government asks the public to invest in government bonds and securities. It would be difficult to explain why a government pension fund is invested elsewhere [16].

However, the reader should be aware that there are different investment strategies for different reasons. If a private investment plan saved the government and taxpayers money, it may not be difficult to explain private sector investment.

Finally, the MRS under its present structure is headed for solvency, and by "1997 the DOD trust fund will have about $300 billion in assets" (16). Opening the debate for

private sector investment is sure to bring about congressional and administration battles which have only recently subsided.

Investment Firm Point of View. Disregarding the legal, administrative, and bureaucratic implications, an investment management firm is the ideal candidate for overseeing a MRS trust fund in the private sector. With this in mind, some considerations are necessary.

First, because of the tremendous size of the retirement fund, an investment management firm such as Dean Investment Associates would be reluctant to invest the fund in any securities other than government bonds. However, if such an opportunity existed, an example of the portfolio composition for, say, $20 billion, might consist of a minimum of $15 billion invested in government securities and some AAA and AA bonds. The remaining money would be invested in equity composed of stocks in the New York Stock Exchange, the American Exchange, and the over the counter exchanges. Under this portfolio arrangement and because of the size of the fund, there would be "problems finding investments" (26).

Second, because of the conservative nature of the portfolio composition that is necessary to protect the large principal involved, the fund is "not going to generate 15 and 20 percent returns" (26).

Third, conventional commission and management fees may not apply for an amount as large as the MRS. Investment management firms would expect a "decent return for such large

responsibility" (26). Furthermore, an investment firm cannot guarantee the liquidity of the account if the government were to contract the fund to another investment management firm.

Finally, as alluded to by the DOD Actuary, there would be concern over how the MRS trust fund "affects the price of stocks" (26). This concern would not be as substantial when purchasing interest in large corporations, but the effect on smaller companies is difficult to assess (26).

V. Conclusions and Recommendations

Conclusion

The U.S. Military Retirement System has exhibited a tradition of compensation and recognition for its members who have served their country honorably for a minimum of twenty years. Numerous legislative improvements and efficiency measures have brought the system to its current state of providing between fifty and seventy-five percent of the member's active duty pay.

The salient aspect of the current system is the recent enactment of Public Law 98-94. The law implemented an accrual accounting system that recognizes future retirement costs immediately when manpower levels, basic pay, or both are changed. However, before the accrual accounting method was instituted, the government had amassed over $500 billion in unfunded liability for manpower and pay decisions made decades earlier. Consequently, along with the new accounting procedure, the law requires Treasury payments to be amortized to eventually eliminate the unfunded liability.

In addition to the Treasury payments, Public Law 98-94 requires DOD accrual charges to be paid each fiscal year to account for future retirement costs as well as outlays to retirees. These payments attract attention because of the actuarial assumptions used to determine the accrual charge. In particular, the real interest rate can be considered

conservative.

This study investigated the possibility of improving the real interest rate assumed by the DOD Actuary by investment of military retirement funds in the private sector. In performing the research, it was necessary to rely upon hypothetical budget activity that allows extragovernmental transactions for purchasing of private sector investments. Under the guise of a unified budget with such transactions, the key issue is the generation of revenues for the transactions. Therefore, three combinations of revenue generation that rely on Treasury issues and tax increases were studied.

Within each issue/tax combination, several investment plans (some specific, others broad-based) were investigated for feasibility with regards to improving the real interest rate. Several plans showed potential improvement under each issue/tax combination.

The reward of an improved real interest rate for the investment plans studied is not without implications. First, all of the investment plans pose a riskier option as compared to the current intragovernmental investment. This risk is a function of the variability of the private sector which has the potential for negative growth as well as greater reward when compared to the current MRS.

Second, the plans under each issue/tax combination can, like the present MRS, affect deficit spending as well as the national debt. This consequence also risks the funding of

the MRS if the necessary revenues cannot be generated through issues or taxes. In the present economic state of the administration, the passage of legislation for the appropriate issues/tax combination is indeed an issue for contention.

Finally, additional legislation would be required to authorize and outline the administrative and bureaucratic aspects of investing in the private sector.

Recommendations

Because of the implications arising from the possibility of investing the military retirement fund in the private sector, additional research should be conducted to further define and assess the implications. Below, lessons learned that might assist future research efforts in the area of retirement precede some specific topics recommended for further research.

Lessons Learned. Performing research in the military retirement subject area involves a variety of topics with a considerable amount of literature and previous research. With such a complex array of future research options, the following lessons learned might prove helpful for the potential researcher of the MRS.

Scope. The researcher is encouraged to sample as much information as possible, but, because of the enormity of the MRS research area, it is a good idea to focus in on a particular area or research question early in the research

process.

Points of Contact. At varying levels such as base, personnel headquarters, and DOD, the researcher should interview experts in the area of retirement. Often an instructor or associate has done research in retirement. Also, it is important to learn as much as possible before progressing to the next level for expert advice; otherwise, the material gathered at higher levels will be useless until the researcher can grasp the concepts and ask intelligent questions.

Variety of Sources. Researchers should not limit themselves to military sources and military technical publications. Often the Congress has gathered pertinent information through its Congressional Budget Office and Congressional Research Services. In addition, local university and community libraries have general information concerning the economy, the federal budget, congressional hearings, and statutes as well as retirement.

Further Research. The additional research recommended below is not all inclusive, but it is representative of the questions raised by this study. The topics below focus on the investment of the military retirement fund in the private sector and the real interest rate assumption used in the actuarial projection models of the present MRS.

1. If, indeed, real interest rates are high enough in certain issue/tax combinations to "eliminate" the accrual charge, what would the new accrual schedule and projections be under such a plan?

2. In its evaluation of the actuarial assumptions concerning the MRS, the Unicon Research Corporation recommends "applying the social discount rates to government project valuations" instead of private financial interest rates (Uni:77,124). However, "there is no professional consensus on a value" (Uni:77). What would be acceptable social discount rates for the MRS, and what is the sensitivity of actuarial projections to changes in the social discount rate?

3. If the government is assumed to be operating without a spending deficit, does the private sector investment approach become more attractive? In particular, what does a detailed accounting analysis of the flow of revenues reveal? What are the effects of compound interest on accrual charges? How does the political and bureaucratic nature affect a change to private sector investment?

4. If the government is assumed to already be investing the military retirement fund in private sector, what are the impacts of short-term perturbations in the stock market and private sector?

5. What does a detailed analysis of portfolio composition reveal? In particular, if a private sector portfolio is composed primarily of government issues, how does this investment strategy differ from the current MRS?

6. What are the rules that the investment management firm must follow in its handling of the military retirement fund? How would a firm be selected, or is one firm enough to insure the safety of the military retirement fund?

7. What are the macroeconomic impacts of investing such a large fund in the private sector? Can stock and bond prices be affected by the MRS investment? Is the fund too large with regards to finding a market in which to invest?

8. What rules would be required to regulate the percent composition of particular investment vehicles in the MRS portfolio to ensure fairness?

9. Does the U.S. Constitution or public opinion allow for such a substantial government interest in the private sector (13)?

In closing, this preliminary research concerned with investing the military retirement fund in the private sector was conducted within several constraints. Because of some of the constraints, such as the national debt and deficit spending, the investment of the MRS in the private sector has implications that can be considered of a policy nature. As additional research is attempted in this subject area, the researcher should be aware that, and perhaps even investigate whether, management of such a fund is dependent on such constraints.

Appendix A: *Excerpt from Public Law 98-94-- September 24, 1983 that Applies to Accrual Funding in the Military Retirement System*

PART B--RETIRED PAY MATTERS...

ACCRUAL FUNDING FOR THE MILITARY RETIREMENT SYSTEM

SEC. 925 (a)(1) Title 10, United States Code, is amended by inserting after chapter 73 the following new chapter:

"CHAPTER 74--DEPARTMENT OF DEFENSE MILITARY RETIREMENT FUND

"Sec.
"1461. Establishment and purpose of Fund; definition.
"1462. Assets of Fund.
"1463. Payments from the Fund.
"1464. Board of Actuaries.
"1465. Determination of contributions to the Fund.
"1466. Payments into the Fund.
"1467. Investment of assets of Fund.

"...1461. Establishment and purpose of Fund; definition

"(a) There is established on the books of the Treasury a fund to be known as the Department of Defense Military Retirement Fund (hereinafter in this chapter referred to as the 'Fund'), which shall be administered by the Secretary of the Treasury. The Fund shall be used for the accumulation of funds in order to finance on an actuarially sound basis liabilities of the Department of Defense under military retirement and survivor benefit programs.

"(b) In this chapter, 'military retirement and survivor benefit programs' means--

(1) the provisions of this title creating entitlement to or determining the amount of, retired or retainer pay; and

(2) The programs under the jurisdiction of the Department of Defense providing annuities for survivors of members and former members of the armed forces, including chapter 73 of this title, section 4 of Public Law 92-425, and section 5 of Public Law 96-402.

"...1462. Assets of Fund

"There shall be deposited into the fund the following, which shall constitute the assets of the Fund:

"(1) Amounts paid into the Fund under section 1466 of this title.

"(2) Any amount appropriated to the Fund.

"(3) Any return on investment of the assets of the Fund.

"...1463. Payments from the Fund

"(a) There shall be paid from the Fund--

"(1) retired pay payable to persons on the retired lists of the Army, Navy, Air Force, and Marine Corps;

"(2) retainer pay payable to members of the Fleet Reserve and Fleet Marine Corps Reserve; and

"(3) benefits payable under programs under the jurisdiction of the Department of Defense that provide annuities for survivors of members and former members of the armed forces, including chapter 73 of this title, section 4 of Public Law 92-425, and section 5 of Public Law 96-402.

"(b) The assets of the Fund are hereby made available for payments under subsection (a).

"...1464. Board of Actuaries

"(a)(1) There is established in the Department of Defense a Department of Defense Retirement Board of Actuaries (hereinafter in this chapter referred to as the 'Board'). The Board shall consist of three members, who shall be appointed by the President from among qualified professional actuaries who are members of the Society of Actuaries.

"(2)(A) Except as provided in subparagraph (B), the members of the Board shall serve for a term of 15 years, except that a member of the Board appointed to fill a vacancy occurring before the end of the term for which his predecessor was appointed shall only serve until the end of such term. A member may serve after the end of his term until his successor has taken office. A member of the Board may be removed by the President for misconduct or failure to perform functions vested in the Board, and for no other reason.

"(B) Of the members of the Board who are first appointed under this subsection, one each shall be appointed for terms ending five, ten, and fifteen years, respectively, after the date of appointment, as designated by the President at the time of appointment.

"(3) A member of the Board who is not otherwise an employee of the United States is entitled to receive pay at the daily equivalent of the annual rate of basic pay of the highest rate of basic pay then currently being paid under the General Schedule of subchapter III of chapter 53 of title 5, for each day the member is engaged in the performance of duties vested in the Board and is entitled to travel

expenses, including a per diem allowance, in accordance with section 5703 of title 5.

"(b) The Board shall report to the Secretary of Defense annually on the actuarial status of the Fund and shall furnish its advice and opinion on matters referred to it by the Secretary.

"(c) The Board shall review valuations of the Fund under section 1466 of this title and under chapter 95 of title 31 and shall report periodically, not less than once every four, to the President and Congress on the status of the Fund. The Board shall include in such reports recommendations for such changes as in the Board's judgment are necessary to protect the public interest and maintain the Fund on a sound actuarial basis.

"...1465. Determination of contribution to the Fund

"(a) Not later than six months after the Board of Actuaries is first appointed, the Board shall determine the amount that is the present value (as of October 1, 1984) of future benefits payable from the Fund that are attributable to service in the armed forces performed before October 1, 1984. That amount is the original unfunded liability of the Fund. The Board shall determine the period of time over which the original unfunded liability should be liquidated and shall determine an amortization schedule for the liquidation of such liability over that period. Contributions to the Fund for the liquidation of the original unfunded liability in accordance with such schedule shall be made as provided in section 1466(b) of this title.

"(b)(1) The Secretary of Defense shall determine each year, in sufficient time for inclusion in budget requests for the following fiscal year, the total amount of Department of Defense contributions to be made to the Fund during that fiscal year under section 1466(a) of this title. That amount shall be determined as the product of--

"(A) the current estimate of the value of the single level percentage of basic pay to be determined at the time of the next actuarial valuation under subsection (c); and

"(B) the total amount of basic pay to expected to be paid during that fiscal year to members of the armed forces (other than the Coast Guard) on active duty or in the Selected Reserves.

"(2) The amount determined under paragraph (1) for any fiscal year is the amount needed to be appropriated to the Department of Defense for that fiscal year for payments to be made to the Fund during that year under section 1466(a) of

this title. The President shall include not less than the full amount so determined in the budget transmitted to Congress for that fiscal year under section 1105 of title 31. The President may comment and make recommendations concerning any such amount.

"(c)(1)(A) Not less often than every four years, the Secretary of Defense shall carry out an actuarial evaluation of Department of Defense military retirement and survivor benefit programs. Each actuarial valuation of such programs shall include a determination (using the aggregate entry-age normal cost method) of a single level percentage of basic pay to be used for the purposes of subsection (b) and section 1466(a) of this title.

"(2) If at the time of any such valuation (or any valuation carried out in order to comply with chapter 95 of title 31) there has been a change in benefits under a military retirement or survivor benefit program that has been made since the last such valuation and such change in benefits increases or decreases the present value of amounts payable from the Fund, the Secretary of Defense shall determine an amortization methodology and schedule for the amortization of the cumulative unfunded liability (or actuarial gain to the Fund) created by such change and any previous such changes so that the present value of the sum of the amortization payments (or reductions in payments that would otherwise be made) equals the cumulative increase (or decrease) in the present value of such amounts.

"(3) If at the time of any such valuation (or any valuation carried out in order to comply with chapter 95 of title 31) the Secretary of Defense determines that, based upon changes in actuarial assumptions since the last valuation, there has been an actuarial gain or loss to the Fund, the Secretary shall determine an amortization methodology and schedule for the amortization of the cumulative gain or loss to the Fund created by such change in assumptions and any previous changes in assumptions through an increase or decrease in the payments that would otherwise be made to the Fund.

"(4) Contributions to the Fund in accordance with amortization schedules under paragraphs (2) and (3) shall be made as provided in section 1466(b) of this title.

"(d) All determinations under this section shall be made using methods and assumptions approved by the Board of Actuaries (including assumptions of interest rates and inflation) and in accordance with generally accepted actuarial principles and practices.

"(e) The Secretary of Defense shall provide for the keeping of such records as are necessary for determining the

actuarial status of the Fund.

"...1466. Payments into the Fund

"(a) The Secretary of Defense shall pay into the Fund at the end of each month as the Department of Defense contribution to the Fund for that month the amount that is the product of--

"(1) the level percentage of basic pay determined under the most recent (as of the first day of the current fiscal year) actuarial valuation under section 1465(c) of this title; and

"(2) the total amount of basic pay that month to members of the armed forces (other than the Coast Guard) on active duty or in the Selected Reserve.

Amounts paid into the Fund under this subsection shall be paid from funds available for the pay of members of the armed forces under the jurisdiction of the Secretary of a military department.

"(b)(1) At the beginning of each fiscal year the Secretary of the Treasury shall promptly pay into the Fund from the General Fund of the Treasury the amount certified to the Secretary by the Secretary of Defense under paragraph (3). Such payment shall be the contribution to the Fund for that fiscal year required by sections 1465(a) and 1465(c) of this title.

"(2) At the beginning of each fiscal year the Secretary of Defense shall determine the sum of the following:

"(A) The amount of the payment for that year under the amortization schedule determined by the Board of Actuaries under section 1465(a) of this title for the amortization of the original unfunded liability of the Fund.

"(B) The amount (including any negative amount) for that year under the most recent amortization schedule determined by the Secretary of Defense under section 1465(c)(2) of this title for the amortization of any cumulative unfunded liability (or any gain) to the Fund resulting from changes in benefits.

"(C) The amount (including any negative amount) for that year under the most recent amortization schedule determined by the Secretary of Defense under section 1465(c)(3) of this title for the amortization of any cumulative actuarial gain or loss to the Fund.

"(3) The Secretary of Defense shall promptly certify the amount determined under paragraph (2) each year to the Secretary of the Treasury.

Appendix A (cont.): *Excerpt from Public Law 98-94-- September 24, 1983 that Applies to Accrual Funding in the Military Retirement System*

"...1467. Investment of assets of Fund

"The Secretary of the Treasury shall invest such portion of the Fund as is not in the judgment of the Secretary of Defense required to meet current withdrawals. Such investments shall be in public debt securities with maturities suitable to the needs of the Fund, as determined by the Secretary of Defense, and bearing interest at rates determined by the Secretary of the Treasury, taking into considerations current market yields on outstanding marketable obligations of the United States of comparable maturities. The income on such investments shall be credited to and from a part of the Fund.".

(2) The tables of chapters at the beginning of subtitle A, and at the beginning of part II of subtitle A, of title 10, United States Code, are amended by inserting after the item relating to chapter 73 the following new item:

"74. Department of Defense Military Retirement Fund....1461".

(b)(1) Section 1464 (related to the Board of Actuaries) of title 10, United States Code, as added by subsection (a), shall take effect on October 1, 1983.

(2) Sections 1463 (relating to payments from the Fund) and 1466 (relating to payments from the Fund) of title 10, United States Code, as added by subsection (a), shall take effect on October 1, 1984.

(3) There shall be transferred into the Fund on October 1, 1984, any unobligated balances of appropriations made to the Department of Defense that are currently available for retired pay, and amounts so transferred shall be part of the assets of the Fund [28].

Appendix B: *Military Retirement System Past and Projected Flow of Plan Assets ($ Billion)* (adapted from 20:16)

FISCAL YEAR	TOTAL BASIC PAYROLL	NORMAL COST PAY-MENTS	NORMAL COST PAYMENT AS % OF PAYROLL	AMORTIZA-TION OF UNFUNDED LIABILITY	AMORTIZA-TION OF UNFUNDED LIABILITY AS % OF PAYROLL	INVEST-MENT INCOME	INVEST-MENT INCOME AS % OF PAYROLL	FUND DISBURSE-MENTS	FUND DISBURSE-MENTS AS % OF PAYROLL	FUND BALANCE END OF YEAR	FUND BALANCE END OF YEAR AS % OF PAYROLL
PAST FLOW											
1985	33.5	17.0	0.507	9.5	0.284	1.1	0.333	15.8	0.472	12.0	0.358
1986	35.4	17.4	0.492	10.5	0.297	2.5	0.071	17.6	0.497	24.6	0.695
PROJECTED FLOW											
1987	36.6	18.8	0.513	10.5	0.288	2.4	0.066	18.2	0.497	38.1	1.041
1988	38.4	19.3	0.503	10.3	0.268	3.2	0.083	19.1	0.498	51.8	1.350
1989	40.4	19.9	0.492	10.6	0.262	4.1	0.102	20.2	0.500	66.2	1.639
1990	42.6	20.6	0.484	11.1	0.260	5.1	0.120	21.3	0.500	81.7	1.916
1991	44.9	21.4	0.476	11.7	0.260	6.0	0.134	22.4	0.499	98.4	2.191
1992	47.1	22.1	0.469	12.3	0.261	7.3	0.155	23.5	0.499	116.6	2.477
1993	23.3	23.3	0.463	12.9	0.257	8.5	0.169	25.0	0.497	136.3	2.710
1994	50.3	24.6	0.458	13.5	0.252	9.8	0.182	26.7	0.498	157.5	2.932
1995	53.7	26.0	0.453	14.5	0.253	11.2	0.195	28.6	0.499	180.6	3.152
1996	61.1	27.4	0.449	15.5	0.253	12.8	0.210	30.6	0.502	205.7	3.368
1997	65.0	28.9	0.444	16.5	0.254	14.5	0.223	32.8	0.505	232.8	3.579
1998	69.2	30.4	0.440	17.6	0.255	16.5	0.239	35.3	0.510	262.0	3.787
1999	73.5	32.0	0.435	18.8	0.255	18.3	0.249	37.9	0.515	293.2	3.988
2000	78.1	33.7	0.432	20.0	0.256	20.4	0.261	40.6	0.520	326.7	4.182
2001	83.0	35.5	0.428	21.2	0.256	22.8	0.275	43.6	0.525	362.6	4.368
2002	88.2	37.4	0.424	22.5	0.256	25.2	0.286	46.7	0.529	401.0	4.546
2003	93.7	39.4	0.421	24.0	0.256	27.7	0.296	49.9	0.533	442.2	4.720
2004	99.5	41.6	0.418	25.5	0.256	30.5	0.306	53.4	0.536	486.4	4.887
2005	105.8	43.9	0.415	27.0	0.256	33.5	0.317	56.9	0.538	533.9	5.045
2006	112.6	46.5	0.413	28.7	0.255	36.7	0.326	60.6	0.538	585.2	5.197

Appendix B (cont.): *Military Retirement System Past and Projected Flow of Plan Assets ($ Billion)* (adapted from 20:16)

FISCAL YEAR	TOTAL BASIC PAYROLL	NORMAL COST PAY-MENTS	NORMAL COST PAYMENT AS % OF PAYROLL	AMORTIZA-TION OF UNFUNDED LIABILITY	AMORTIZA-TION OF UNFUNDED LIABILITY AS % OF PAYROLL	INVEST-MENT INCOME	INVEST-MENT INCOME AS % OF PAYROLL	FUND DISBURSE-MENTS	FUND DISBURSE-MENTS AS % OF PAYROLL	FUND BALANCE END OF YEAR	FUND BALANCE END OF YEAR AS % OF PAYROLL
2007	119.8	49.2	0.411	30.6	0.255	40.1	0.335	64.5	0.538	640.6	5.348
2008	127.3	52.1	0.409	32.5	0.255	43.8	0.344	68.5	0.538	700.5	5.502
2009	135.3	55.1	0.407	34.6	0.256	47.9	0.354	72.7	0.537	765.4	5.657
2010	143.8	58.4	0.406	36.8	0.256	52.3	0.364	77.0	0.536	835.9	5.812
2011	152.9	61.9	0.405	39.1	0.256	57.2	0.374	81.6	0.534	912.5	5.970
2012	162.5	65.8	0.405	41.6	0.256	62.3	0.383	86.3	0.531	995.9	6.129
2013	172.7	69.8	0.404	44.2	0.256	67.9	0.393	91.2	0.528	1086.6	6.291
2014	183.6	74.2	0.404	47.0	0.256	74.1	0.404	96.4	0.525	1185.5	6.457
2015	195.2	78.8	0.404	49.9	0.256	80.9	0.415	101.8	0.522	1293.3	6.627
2016	207.4	83.6	0.403	53.1	0.256	88.0	0.424	107.5	0.518	1410.5	6.800
2021	280.9	113.2	0.403	82.1	0.292	138.4	0.493	141.4	0.503	2220.2	7.904
2026	379.5	152.9	0.403	111.0	0.293	216.0	0.569	185.9	0.490	3470.3	9.145
2031	512.2	206.4	0.403	149.9	0.293	333.5	0.651	247.4	0.483	5364.5	10.473
2036	691.7	278.7	0.403	202.4	0.293	508.7	0.735	332.5	0.481	8188.5	11.839
2041	934.5	376.6	0.403	273.4	0.293	768.1	0.822	455.9	0.477	12372.2	13.240
2046	1262.7	508.9	0.403	369.4	0.293	1150.6	0.911	598.4	0.474	18540.3	14.684
2051	1705.8	687.5	0.403	0.0	0.000	1586.7	0.930	804.7	0.472	25570.4	14.990
2056	2304.4	928.7	0.403	0.0	0.000	2133.5	0.926	1084.9	0.471	34381.9	14.920
2061	3113.0	1254.5	0.403	0.0	0.000	2868.8	0.922	1466.1	0.471	46228.9	14.850

Appendix C. *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

FIRST QUADRENNIAL REVIEW OF MILITARY COMPENSATION (QRMC) (1969)

Financing:
- Career members contribute 6.5 percent of RMC for military retirement and social security benefits. Contributions refunded to those separated before retirement eligibility.

  (QMRC proposed salary--RMC, regular military compensation--for career force consisting of basic pay, nontaxable allowances for quarters and subsistence, plus tax advantage.)

Minimum eligibility requirement (YOS=year(s) of service):
- 20 YOS.

Base for calculating retired pay (RPB=retired pay base):
- Averaging of highest 1 year of RMC.

Method for calculating amount of retired pay (RPB=retired pay base):
- Percentage (multiplier) of RPB for each YOS as follows:

Percent of RBP per YOS

YOS	
1-8	1.5
9-20	1.75
21-22	2.0
23-24	2.5
25-30	3.0
31+	1.5

Two step rate:

Step 1 rate: Multiplier reduced 9 percentage points. (Example: Member who retires with 20 YOS has 33 multiplier. Step 1 multiplier is 24 percent.)

Step 2 rate: Full multiplier restored based on YOS and age schedule. Example:

Age full

YOS when retired	*Rate begins*
20	60
25	57.5
30+	55

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

Maximum retired pay:
- 75 percent of RPB for 40 YOS.

Social Security offset:
- Age 65. Retired pay reduced by amount of annuity attributed to military service.

Severance pay:
- Members with over 4 YOS separated for promotion failure or reduction in force paid 1 year's pay; if separated for "show cause" reasons, paid up to 6 months' pay.

INTERAGENCY COMMITTEE (1971)

Financing:
- Annual appropriations to pay current obligations.

Minimum eligibility retirement (YOS=year(s) of service):
- 20 YOS for immediate retired pay. 10-19 YOS for retired pay beginning at age 60.

Base for calculating retired pay (RPB=retired pay base):
- Average of high-3 consecutive years of basic pay.

Method of calculating amount of retired pay (RPB=retired pay base):
- Percentage (multiplier) of RPB for each YOS as follows:

Percent of RPB per YOS

YOS	
1-24	2.5
25-30	3.0
31-35	2.0

Two step rate. Retired pay for a member who retires with less than 25 YOS is reduced 2 percent for each year he is under age 60. Full rate restored at age 60. Retired pay for a member who retires with 25+ YOS is reduced 2 percent for each year he is under age 55. Full rate is restored at age 55.

Maximum retired pay:
- 88 percent of RPB for 35 YOS.

Social Security offset:
- Age 65. Retired pay reduced by 50 percent of annuity attributable to military service.

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

Severance pay:
- Members involuntarily separated with 5-19 YOS receive lump-sum payment equal to 5 percent of 12 months' final basic pay per YOS. Those with 10 or more YOS may elect to receive retired pay at age 60 or a second lump-sum payment.

[Proposed] RETIREMENT MODERNIZATION ACT (DOD RETIREMENT STUDY GROUP) (1974)1

Financing:
- Annual appropriations to pay for current obligations.

Minimum eligibility requirement (YOS=year(s) of service):
- 20 YOS for immediate retired pay. 5-19 YOS for retired pay beginning at age 60.

Base for calculating retired pay (RPB=retired pay base):
- Average high-1 year of basic pay.

Method for calculating retire pay (RPB=retired pay base):
- Percentage (multiplier) of RPB for each YOS as follows:

Percent of RPB per YOS

YOS	
1-24	2.5
25-30	3.0

Two step rate.

Step 1 rate: Multiplier reduced 15 percentage points if member retires with less than 30 YOS (Example: Member who retires with 20 YOS has 50 percent multiplier based on formula above. Step 1 multiplier is 35 percent.)

Step 2 rate; Full multiplier restored after date member would have completed 30 YOS.

Maximum retired pay:
- 78 percent of RPB for 30 YOS.

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1 The Third Quadrennial Review of Military Compensation (1976) reaffirmed the provisions of RMA

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

Social Security offset:
- Age 65. Retired pay reduced by 50 percent of the annuity attributable to military service.

Severance pay:
- Members involuntarily separated with 5-19 YOS receive lump-sum payment computed at 5 percent of 12 months' final basic pay per YOS and retired pay beginning at age 60 or second lump-sum payment.

DEFENSE MANPOWER COMMISSION (1976)

Financing:
- Accrual financing, chargeable to individual military service budget, for cost of future liabilities for members in active service.

Minimum eligibility requirement (YOS=year(s) of service):
- 20 YOS and accrual of 30 points for immediate retired pay. 10 YOS for retired pay beginning at age 60 or 65.

  (Commission suggested a plan to give values to military jobs in relation to their combat or noncombat requirements. Combat jobs would be assigned a value of 1.5. Noncombat jobs had a value of 1. Other jobs would be given intermediate values. Retirement points a accumulated at 1/365th of the point value of a job each day in that job.)

Base for calculating retired pay (RPB=retired pay base):
- Average of high-3 years of basic pay.

Method for calculating retired pay (RPB=retired pay base):
- Two and two-thirds percent of RPB for each retirement point.

Maximum retired pay:
- 80 percent of RPB for 30 retirement points.

Social Security offset:
- No. Commission recommended that level of retired pay should consider social security benefits.

Severance pay:
- Members with 10 or more YOS:

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

Voluntary separation:
Paid retired pay, as computed above, at age 65 or actuarially reduced amount at age 60.

Involuntary separation:
Lump-sum payment equal to two and two-thirds of 24 months' final basic pay per YOS.

LEGISLATION PROPOSED BY REPRESENTATIVE LES ASPIN (1976)

Financing:
- Fund developed through 7-percent contribution of member's RMC and matching contribution by DOD.

Minimum eligibility requirement:
- *Voluntary retirement:*

Retired pay begins

YOS	*Age*
5-19	62
20-29	60
30+	55

- *Involuntary retirement:*
  5 YOS (see section on severance pay below).

Base for calculating retired pay (RPB=retired pay base):
- Average of high-3 years of RMC.

Method for calculating retired pay (RPB=retired pay base):
- Percentage (multiplier) of RPB for each YOS, as follows:

Percent of RPB per YOS

YOS	
1-5	1.5
6-10	1.75
11+	2.0

Maximum retired pay:
- Dependent on YOS at retirement.

Social Security offset:
- Not decided.

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

Severance pay:
- Members with 5 or more YOS involuntarily separated receive immediate retired pay reduced by $1 for each $2 of earned past retirement income.

PRESIDENT'S COMMISSION ON MILITARY COMPENSATION (1976)

Financing:
- Fund developed by annual appropriations covering future liabilities for members in active service. Annual appropriations to pay current retired pay liabilities until paid off.

Minimum eligibility requirement (YOS=year(s) of service):

Retired pay

YOS	*Age*
10-19	62
20-29	60
30+	55

(Federal civilian service also could be counted if member had at least 10 years of military service.)

Base for calculating retired pay (RPB=retired pay base):
- Average of high-3 years of basic pay.

Method for calculating retired pay (RPB=retired pay base):
- Percentage (multiplier) of RPB for each YOS, as follows:

Percent of RPB per YOS

YOS	
1-5	2.0
6-10	2.25
11-35	2.75

Maximum retired pay:
- 90 percent of RPB for 35 YOS.

Social Security offset:
- Age 65 or 62 if social security is elected early. Retired pay reduced by 1.25 percent of initial primary benefit per YOS. Reduction may not exceed 50 percent of retired pay.

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

Severance pay:

- Members involuntarily separated with 5 or more YOS paid one quarter month's final basic pay for each YOS through 10.5 month's final basic pay for each YOS from 11 through 30. Maximum payment limited to 1 year's basic pay and not payable to anyone entitled to retired pay.

Deferred compensation:

- Establishes a deferred compensation trust fund for active-duty members with more than 5 YOS. Purpose of fund is to provide for transition from military life. Fund financed by Government contributions at rates shown below and accumulates at interest.

Government contribution schedule:

Percent of basic pay

Member's YOS	
6-10	20
11-20	25
21-25	15
26-30	5

Members who complete 10 YOS are entitled to withdraw up to 50 percent of fund while on active duty. Upon leaving active duty, members may leave funds in account to withdraw at later date or convert to a monthly or annual annuity for no less than 2 years.

[Proposed] UNIFORMED SERVICES RETIREMENT BENEFITS ACT (1979)

Financing:

- Fund developed from annual appropriations covering future liabilities for members on active duty. Annual appropriations to pay current retired pay liabilities until paid off.

Minimum eligibility requirement (YOS=year(s) of service):

- 20 YOS for immediate retired pay. 10-19 for retired pay beginning at age 60.

Base for calculating retired pay (RPB=retired pay base):

- Average of high-2 years of basic pay.

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 5:377-381)

Method of calculating retired pay (RPB=retired pay base):
- Two step rate:

Step 1: Percentage (multiplier) of RPB for each YOS, as follows:

Percent of RPB per YOS

YOS	
1-10	1.75
6-10	2.0
21+	2.75

Step 1 rate applies until age 60 when step 2 rate applies.

Step 2: Percentage (multiplier) of RPB for each YOS, as follows:

Percentage of RPB per YOS

YOS	
1-5	2.0
6-10	2.25
11+	2.75

Maximum retired pay:
- *Step 1:* 76.25 percent of RPB at 36 YOS.

Step 2: 76.25 percent of RPB at 30 YOS.

Social Security offset:
- At age 65 or 62 if social security is selected early. Retired pay reduced by 1.25 of initial social security benefit per YOS, not to exceed 50 percent reductions.

Severance pay:
- Members involuntarily separated with 5-19 YOS paid lump-sum payment equal to 5 percent of 12 month's final basic pay per YOS. Members with 10+ YOS can elect combination of severance pay and cash withdrawals (see below) in lieu of retired pay at age 60.

Cash withdrawal payments:
- Members separated with 10 19 YOS may elect a cash withdrawal payment(s) in lieu of retired pay starting at age 60. Such payment is based on 1 month's basic pay for the first 10 YOS and 2 month's basic pay for the next 5 YOS for a maximum of 20 month's of basic pay.

Retired pay entitlement may be reinstated by paying back amount of cash withdrawal.

Members with 20+ YOS may also elect a cash withdrawal payment(s) computed at same rates. Any amount withdrawn must be refunded either by repayment before receiving retired pay or through reductions in retired pay.

PRESIDENT'S PRIVATE SECTOR SURVEY ON COST CONTROL (1984)

Financing:
- Accrual funding chargeable to individual military service budget, to include full funding dynamic unfunded liability.

Minimum eligibility requirement:
- Ten years of service.

Base for calculating retired pay:
- Average of high-5 years of basic military compensation. Members within three years of retirement exempted form this change.

Method for calculating retired pay:
- 1.6 percent of retired pay base per year of service.

Maximum retired pay:
- Not discussed. Formula yields 48 percent of retired pay base at 30 years of service, which is maximum years of service under current system.

Social Security offset:
- Age 62. Retired pay reduced by 1.25 percent of primary insurance amount per year of service. Applies to all annuitants including current retirees.

Severance pay:
- Not discussed.

Deferred Compensation:
- No annuity until age 55. If member elects to receive it before age 62, annuity is permanently reduced by one half percent for every month that member's age at initial receipt is short of 62nd birthday.

Transition payment for members with over 20 years of service during first five years after retirement. Transition base equal to 1.6 percent of retired pay base per year of service. Transition benefit:

	Years after Retirement				
	1	2	3	4	5
Percent of transition base	100	80	60	40	20

Cost-of-Living Adjustment (COLA):
- Full COLA from initial receipt of annuity until age 62. One-third COLA after age 62. No adjustment of retired pay base between date of separation form service and initial receipt of annuity. Applies to all annuitants including current retirees.

FIFTH QUADRENNIAL REVIEW OF MILITARY COMPENSATION (QMRC V) (1984)

Financing:
- Accrual funding, according to current law.

Minimum eligibility requirement:
- 20 years of service.

Base for calculating retired pay:
- Final basic pay for members entering service prior to September 8, 1980. Average of high-3 basic pay otherwise.

Method for calculating retired pay:
- 2.5 percent of retired pay base per year of service; 3 percent reduction for each year that years of service at retirement are short of 30 years of service.

Maximum retired pay:
- 75 percent of retired pay base for 30 years of service.

Appendix C (cont.). *Summaries of Major Proposals for Changing the Military Retirement System* (adapted from 3:78-79)

Social Security offset:
- No.

Severance pay:
- No change from current system.

Cost-of-Living-Adjustment (COLA):
- Three quarters COLA for all retirees under age 62. Full COLA thereafter, but no restoral of retired pay base.

Cash withdrawal payments:
- Members retiring after 20 or more years of service receive cash withdrawal payments at retirement equal to final basic pay multiplied by two (for officers) ar three (for enlisteds). After the completion of 20 years of service but before retirement, members may elect interest-only loans up to the cash withdrawal amount.

Appendix D: *Sample of Mutual Funds from 1947 through 1978* (adapted from 2:28)

Code	Name	Annual Returns (%) Mean	Std Dev	Coeff of Var
GI	Affiliated Fund, Inc.	10.65	14.74	1.38
I	Axe-Houghton Income Fund, Inc.	9.52	15.90	1.67
G	Axe-Houghton Stock Fund, Inc.	9.94	19.74	1.99
I	Century Shares Trust	10.37	20.11	1.93
G	Chemical Fund, Inc.	10.13	20.54	2.03
GI	The Colonial Fund, Inc.	9.77	16.25	1.66
B	Composite Bond & Stock Fund, Inc.	7.72	11.52	1.49
GI	Delaware Fund, Inc.	7.98	17.53	2.20
B	Dodge & Cox Balanced Fund	8.04	12.16	1.51
B	Eaton & Howard Balanced Fund	7.53	10.74	1.43
GI	Fidelity Fund, Inc.	11.46	17.21	1.50
G	Growth Industry Shares, Inc.	10.68	18.98	1.78
GI	The Investment Company of America	12.05	17.05	1.41
GI	Investment Trust of America	10.69	18.05	1.69
B	Investors Mutual, Inc.	7.30	11.63	1.59
I	Investors Selective Fund	5.25	5.78	1.10
G	Johnston Mutual Fund, Inc.	9.68	15.22	1.57
B	Loomis-Sayles Mutual Fund, Inc.	7.37	11.12	1.51
G	Massachusetts Investors Growth Stock Fund	11.21	19.08	1.70
I	Mutual Investing Foundation-MIF Fund	9.72	15.82	1.63
G	National Investors Corporation	11.92	18.58	1.56
G	National Growth Fund	10.46	20.74	1.98
B	Nation-Wide Securities Company, Inc.	8.07	10.94	1.36
I	Puritan Fund, Inc.	11.19	15.79	1.41
B	The George Putnam Fund of Boston	9.07	13.42	1.48
G	Scudder Common Stock Fund, Inc.	9.72	17.85	1.84
I	Scudder Income Fund, Inc.	6.76	12.08	1.79
GI	Selected American Shares, Inc.	8.89	16.31	1.83
GI	State Street Investment Corporation	10.80	15.73	1.46
I	United Income Fund	10.17	16.50	1.62
B	Wellington Fund	7.13	11.18	1.57
I	Wisconsin Income Fund, Inc.	8.36	15.04	1.08

Code (Weisenberger Classifications):
G Growth
GI Growth and Income
I Income
B Balanced

Appendix E: *Dean Investment Associates Investment Performance for Balanced Accounts* (adapted from 26)

Year	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Compounded Annual Performance
1973	4.3	2.0	7.5	-4.7	9.0
1974	9.7	1.4	-5.5	2.7	8.0
1975	12.8	7.2	3.3	4.2	30.2
1976	11.6	2.1	6.3	0.9	22.2
1977	1.3	1.3	5.7	3.1	11.8
1978	2.1	2.5	8.3	-5.9	6.7
1979	4.5	4.0	4.4	-1.8	11.4
1980	-2.9	8.2	6.2	4.0	16.0
1981	4.0	1.1	-3.2	9.4	11.3
1982	2.6	3.3	10.7	9.1	28.0
1983	3.6	4.2	1.8	4.2	14.5
1984	-3.5	-1.8	9.9	5.6	10.0
1985	8.3	7.6	-1.5	13.0	29.7
1986	14.4	4.3	-1.3	4.6	23.2
1987	15.4	2.6			

Appendix F. *Outyear Feasible Plan Accrual Charges-- 100% Issues/0% Taxes*

YEAR	ACTUARY PROJECTION	PLAN 1	PLAN 2	PLAN 8
1987	18.8	4.9	18.4	3.6
1988	19.3	5.0	18.9	3.7
1989	19.9	5.2	19.5	3.8
1990	20.6	5.4	20.2	3.9
1991	21.4	5.6	21.0	4.1
1992	22.1	5.7	21.7	4.2
1993	23.3	6.1	22.8	4.4
1994	24.6	6.4	24.1	4.7
1995	26.0	6.8	25.5	4.9
1996	27.4	7.1	26.9	5.2
1997	28.9	7.5	28.3	5.5
1998	30.4	7.9	29.8	5.8
1999	32.0	8.3	31.4	6.1
2000	33.7	8.8	33.0	6.4
2001	35.5	9.2	34.8	6.7
2002	37.4	9.7	36.7	7.1
2003	39.4	10.2	38.6	7.5
2004	41.6	10.8	40.8	7.9
2005	43.9	11.4	43.0	8.3
2006	46.5	12.1	45.6	8.8
2007	49.2	12.8	48.2	9.3
2008	52.1	13.5	51.1	9.9
2009	55.1	14.3	54.0	10.5
2010	58.4	15.2	57.2	11.1
2011	61.9	16.1	60.7	11.8
2012	65.8	17.1	64.5	12.5
2013	69.8	18.1	68.4	13.3
2014	74.2	19.3	72.7	14.1
2015	78.8	20.5	77.2	15.0
2016	83.6	21.7	81.9	15.9
2021	113.2	29.4	110.9	21.5
2026	152.9	39.8	149.8	29.1
2031	206.4	53.7	202.3	39.2
2036	278.7	72.5	273.1	53.0
2041	376.6	97.9	369.1	71.6
2046	508.9	132.3	498.7	96.7
2051	687.5	178.8	673.8	130.6
2056	928.7	241.5	910.1	176.5
2061	1254.5	326.2	1229.4	238.4

Infeasible Plans: 3, 4, 5, 6, 7, 9, 10, 11
"Re-amortize" Plans: None

Appendix G. *Outyear Feasible Plan Accrual Charges-- 50% Issues/50% Taxes*

YEAR	ACTUARY PROJECTION	PLAN 2	PLAN 3	PLAN 11
1987	18.8	9.6	13.7	1.5
1988	19.3	9.8	14.1	1.5
1989	19.9	10.1	14.5	1.6
1990	20.6	10.5	15.0	1.6
1991	21.4	10.9	15.6	1.7
1992	22.1	11.3	16.1	1.8
1993	23.3	11.9	17.0	1.9
1994	24.6	12.5	18.0	2.0
1995	26.0	13.3	19.0	2.1
1996	27.4	14.0	20.0	2.2
1997	28.9	14.7	21.1	2.3
1998	30.4	15.5	22.2	2.4
1999	32.0	16.3	23.4	2.6
2000	33.7	17.2	24.6	2.7
2001	35.5	18.1	25.9	2.8
2002	37.4	19.1	27.3	3.0
2003	39.4	20.1	28.8	3.2
2004	41.6	21.2	30.4	3.3
2005	43.9	22.4	32.0	3.5
2006	46.5	23.7	33.9	3.7
2007	49.2	25.1	35.9	3.9
2008	52.1	26.6	38.0	4.2
2009	55.1	28.1	40.2	4.4
2010	58.4	29.8	42.6	4.7
2011	61.9	31.6	45.2	5.0
2012	65.8	33.6	48.0	5.3
2013	69.8	35.6	51.0	5.6
2014	74.2	37.8	54.2	5.9
2015	78.8	40.2	57.5	6.3
2016	83.6	42.6	61.0	6.7
2021	113.2	57.7	82.6	9.1
2026	152.9	78.0	111.6	12.2
2031	206.4	105.3	150.7	16.5
2036	278.7	142.1	203.5	22.3
2041	376.6	192.1	274.9	30.1
2046	508.9	259.5	371.5	40.7
2051	687.5	350.6	501.9	55.0
2056	928.7	473.6	678.0	74.3
2061	1254.5	639.8	915.8	100.4

Infeasible Plans: 4, 5, 6, 7, 9, 10
"Re-amortize" Plans: 1, 8

Appendix H. *Outyear Feasible Plan Accrual Charges-- 0% Issues/100% Taxes*

YEAR	ACTUARY PROJECTION	PLAN 2	PLAN 3	PLAN 4
1987	18.8	4.9	4.9	10.0
1988	19.3	5.0	5.0	10.2
1989	19.9	5.2	5.2	10.5
1990	20.6	5.4	5.4	10.9
1991	21.4	5.6	5.6	11.3
1992	22.1	5.7	5.7	11.7
1993	23.3	6.1	6.1	12.3
1994	24.6	6.4	6.4	13.0
1995	26.0	6.8	6.8	13.8
1996	27.4	7.1	7.1	14.5
1997	28.9	7.5	7.5	15.3
1998	30.4	7.9	7.9	16.1
1999	32.0	8.3	8.3	17.0
2000	33.7	8.8	8.8	17.9
2001	35.5	9.2	9.2	18.8
2002	37.4	9.7	9.7	19.8
2003	39.4	10.2	10.2	20.9
2004	41.6	10.8	10.8	22.0
2005	43.9	11.4	11.4	23.3
2006	46.5	12.1	12.1	24.6
2007	49.2	12.8	12.8	26.1
2008	52.1	13.5	13.5	27.6
2009	55.1	14.3	14.3	29.2
2010	58.4	15.2	15.2	31.0
2011	61.9	16.1	16.1	32.8
2012	65.8	17.1	17.1	34.9
2013	69.8	18.1	18.1	37.0
2014	74.2	19.3	19.3	39.3
2015	78.8	20.5	20.5	41.8
2016	83.6	21.7	21.7	44.3
2021	113.2	29.4	29.4	60.0
2026	152.9	39.8	39.8	81.0
2031	206.4	53.7	53.7	109.4
2036	278.7	72.5	72.5	147.7
2041	376.6	97.9	97.9	199.6
2046	508.9	132.3	132.3	269.7
2051	687.5	178.8	178.8	364.4
2056	928.7	241.5	241.5	492.2
2061	1254.5	326.2	326.2	664.9

Infeasible Plans: 7, 9
"Re-amortize" Plans: 1, 8, 11

Appendix H (cont.). *Outyear Feasible Plan Accrual Charges--0% Issues/100% Taxes*

YEAR	ACTUARY PROJECTION	PLAN 5	PLAN 6	PLAN 10
1987	18.8	11.3	15.8	12.2
1988	19.3	11.6	16.2	12.5
1989	19.9	11.9	16.7	12.9
1990	20.6	12.4	17.3	13.4
1991	21.4	12.8	18.0	13.9
1992	22.1	13.3	18.6	14.4
1993	23.3	14.0	19.6	15.1
1994	24.6	14.8	20.7	16.0
1995	26	15.6	21.8	16.9
1996	27.4	16.4	23.0	17.8
1997	28.9	17.3	24.3	18.8
1998	30.4	18.2	25.5	19.8
1999	32	19.2	26.9	20.8
2000	33.7	20.2	28.3	21.9
2001	35.5	21.3	29.8	23.1
2002	37.4	22.4	31.4	24.3
2003	39.4	23.6	33.1	25.6
2004	41.6	25.0	34.9	27.0
2005	43.9	26.3	36.9	28.5
2006	46.5	27.9	39.1	30.2
2007	49.2	29.5	41.3	32.0
2008	52.1	31.3	43.8	33.9
2009	55.1	33.1	46.3	35.8
2010	58.4	35.0	49.1	38.0
2011	61.9	37.1	52.0	40.2
2012	65.8	39.5	55.3	42.8
2013	69.8	41.9	58.6	45.4
2014	74.2	44.5	62.3	48.2
2015	78.8	47.3	66.2	51.2
2016	83.6	50.2	70.2	54.3
2021	113.2	67.9	95.1	73.6
2026	152.9	91.7	128.4	99.4
2031	206.4	123.8	173.4	134.2
2036	278.7	167.2	234.1	181.2
2041	376.6	226.0	316.3	244.8
2046	508.9	305.3	427.5	330.8
2051	687.5	412.5	577.5	446.9
2056	928.7	557.2	780.1	603.7
2061	1254.5	752.7	1053.8	815.4

Infeasible Plans: 7, 9
"Re-amortize" Plans: 1, 8, 11

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19. Abstract

The military retirement system is frequently a candidate for budget cuts. Most cost-cutting proposals and legislative actions have been aimed at the benefit structure of the retirement system. However, Public Law 98-94, enacted on October 1, 1984, addresses the *funding* aspect of the military retirement system. The law, which established accrual accounting and a military retirement fund, ensures immediate recognition of the future costs of the retirement system when considering any force size changes and pay changes for DOD. To pay for these future costs, the retirement system partially relies on the investment of excess retirement funds in special interest Treasury securities.

This research concerns the investment aspect of accrual accounting, in particular, the possibility of investing the military retirement fund in the private sector instead of the within the government. To accomplish this "macro-level" research, it is necessary to determine representative private investment plans. The real interest returns of the plans, as determined by several factors such the management of the fund, inflation, and debt implications, are compared to the real return currently assumed by the DOD Office of the Actuary for the special issue securities. Subsequently, for plans showing an improved real return, the approximate savings in terms of annual accrual charges are computed.

The research reveals that a private sector investment approach can provide an improved real return. However, the increased return of the private plans is not without implications such as risk and management of the fund, as well as effects on the national debt and government deficit spending.

The numerous implications and effects discovered in this study support the need for further research in this area to determine the complete impact of a private sector approach to the investment to accrual accounting and the military retirement fund.