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# NAVAL POSTGRADUATE SCHOOL

## Monterey, California



# THESIS

A COST-BENEFIT ANALYSIS OF PERSONNEL POLICIES  
CAUSING OVERPAYMENT AT SEPARATION

by

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June 1987

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A Cost-Benefit Analysis of  
Personnel Policies Causing  
Overpayment at Separation

by

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## ABSTRACT

This thesis reviews the out-of-service debt with emphasis on the personnel policies driving the debt. Using criteria developed in the thesis, elimination of all debt categories, except reenlistment bonuses was accomplished. A review of the policies governing the Selected Reenlistment Bonus Program was conducted, followed by a cost-benefit analysis of the Program. The results indicate a net cost from this Program of \$23 million for the Navy.

The requirements of the Debt Collection Act were then reviewed, and compared to implementation of the Act's provisions by NFC. The impacts on debt collection methods, provided by the Act, were reviewed. The collections under each provision of the Act were identified, with those provisions controlled by the Government providing higher returns than those controlled by civilian organizations.

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## I. INTRODUCTION

With the advent of the large budget deficits experienced during the 1980's, the Congress began its' search for deficit reduction methods. One of the early steps taken by Congress was aimed at the collection of debts owed the federal government by individual citizens. This action was the enactment of the Debt Collection Act of 1982.

Although much of the concern over debts centered on items such as student loans and Veteran's Administration loan guarantees, the Armed Forces had their own debt portfolios that fell under the Act. One of the principal areas for the Services under this Act is the collection of overpayments made to service members.

These overpayments occur when an amount in excess of accrued entitlements is erroneously paid to the member, an allottee or an annuitant. For an annuitant, the overpayment occurs through miscalculation of the entitlement. Collection of the overpayment presents few real problems, however, since the payments will continue and collection action can be accomplished through the reduction of future payments. For allottees, the overpayment occurs when the member stops the allotment, but the payment is sent before the stop action reaches the paying activity. This increases the difficulty of collection action since a continuing entitlement does not exist. These overpayments, however, are relatively infrequent. Additionally, since the payment was made on behalf of the service member, the member may be liable for repayment. The largest category of overpayments, both in frequency and dollar value, is overpayments to the members themselves. These overpayments can be divided into sub-categories based upon the member's service situation. For the purpose of this thesis, the sub-categories used will be the member's current status, either discharged or continuing in service.<sup>1</sup>

With a member that is continuing in service, collection of overpayments is relatively simple. Again the ease of collection is provided by the continued entitlement to pay and allowances which provides the government with a measure of control over the member's income stream. This income can then be reduced to effect the collection action.

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<sup>1</sup>Overpayments can, and do, occur for reserve and retired personnel; these situations, however, are outside the scope of this thesis, and, therefore, not considered.

The most difficult collection situation occurs when the member has been discharged. In this situation, the government no longer has any control over the movements of the individual, and also has no control over the individual's future income. Under these conditions, collection action must be conducted through the mail, relying on the address the individual provided at the time of discharge.

Thus the government starts with the problem of locating the individual. Once located, the next problem is convincing the individual that the debt is valid. And, finally, the problem of actually collecting money in payment of the debt presents itself.

These problems represent the effort the government must put forth in collection of these debts. The real concerns, however, are the amount of the debt, the growth in the level of debt, and the growth in the number of debtors.

## A. BACKGROUND

### 1. Navy Pay System

In order to provide some understanding of how overpayments occur in the Navy's pay system, a gross overview of the system is necessary.

When a member enters active duty, input documents are prepared at the entry station and submitted to the Navy Military Personnel Command (NMPC). From this initial input, NMPC generates a data tape for transmission to the Navy Finance Center (NFC). At NFC a Joint Uniform Military Pay System (JUMPS) pay record is initiated. This pay record is called the Master Military Pay Account (MMPA), and each service member has an individual, unique MMPA.

As the service member continues through their career, this MMPA is continuously updated from field disbursing activity inputs. These pay-impactive inputs are transmitted either through NMPC for personnel actions (e.g., promotions), or directly to NFC for actions solely affecting pay (e.g., leave rations). Thus, throughout the member's tenure, his MMPA at NFC is kept in balance with his local pay record, held and maintained by the local disbursing activity.<sup>2</sup>

At the time of a member's separation, specific procedures have been provided for compliance by the local pay activity to ensure accurate final payment to the departing member [Ref. 1: sect. 10200]. These procedures are intended to ensure the accurate consideration of all pay-impactive actions through the member's discharge date.

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<sup>2</sup>The MMPA currency actually lags the local record due to administrative and transmission times for the pay change documents.



Included within this process is the verification of the posting of all documents transmitted to NFC, the posting to the local pay record of all final pay actions, the computation of the final payment amount, and the preparation and transmission of the local pay record to NFC following the member's discharge.

Once the local pay record is received at NFC, its' posted actions are verified against the MMPA to ensure the two records match. This balancing of the records is supposed to occur within 90 days of the member's separation. [Ref. 1: sect. 10200]

Following this final balancing, NFC will pay the member any underpaid amount, or attempt collection action on any amount overpaid. These overpaid amounts are receivables for the Navy, and, collectively, the overpayments represent the amount held in the accounts receivable file for overpayments at separation - known as out-of-service debt.

## **2. Accounts Receivable**

In 1981, the out-of-service debt was \$18 million, and it is currently at a level of \$60.1 million [Ref. 2]. This represents an increase of 330% over a five year period. During this same five year period, collections increased by a like factor; unfortunately, however, this increase was from \$1 million in 1981 to \$3 million in 1986. Additionally, another \$5 million was written off as uncollectable in 1986, with the annual amount of the write-offs varying between \$1.5 million and \$5.0 million during this five year period.

Overall, the receivables value increased during the period 1984 to 1986 from \$36 million to \$60.1 million, even though \$7.1 million was collected and \$7.5 million was written off. Thus, for the last three years alone, the out-of-service debt generated was approximately \$38.7 million.

It can be seen from this data, that the concerns with out-of-service debt are the rapid growth rate of the debt, the low level of collections, and the high level of write-offs.

## **B. FOCUS AND OBJECTIVES OF RESEARCH**

With the problems identified above, it is obvious that the Navy needs to be concerned with the causes of these overpayments. Hence the objective of this thesis is, first, to determine what the reasons are, within the pay system, for the overpayments. With these reasons in hand, isolate the predominant overpayment category or categories, and relate these to any underlying personnel policies which drive the overpayments. Finally, focusing on the identified personnel policies, use a cost-benefit analysis to determine what the net cost or benefit of the policy is to the Navy.

### **C. RESEARCH QUESTIONS**

The overall research question, as discussed above, is what net cost or benefit is derived for the Navy from the use of pay-impactive personnel policies which cause overpayment at separation. In support of this, the following subsidiary questions must be answered:

1. What specific personnel policies generate routine overpayments at the time of member separation?
2. What is the amount of the overpayments?
3. What costs are incurred in the maintenance of the accounts receivable file, and in conducting collection efforts?
4. What portion (quantity and dollar value) of the overpayments is collected, and in what time frame following separation?
5. What savings accrue in manpower costs through the implementation and use of these policies?

### **D. SCOPE AND LIMITATIONS**

This thesis is concerned with the costs and benefits accruing to the Navy based upon the use of pay-impactive personnel policies. With this scope in mind, these costs and benefits will be identified and quantified to allow the completion of the analysis. Externalities (costs and benefits caused by these policies, but not Navy impactive) will not be quantified or used within the analysis. Identification of these externalities will, however, be made to allow the reader to utilize their own judgement relative to the importance of these factors.

### **E. METHODOLOGY**

The overpayment reasons within the pay system will be identified using a JUMPS data enquiry. Specifically, an enquiry into the JUMPS data base will be entered to identify all currently active receivable accounts for out-of-service debt which were established during the period 1984 to 1986. To prevent identification of any individual debtor, the output format was specified as summary data by overpayment reason code.

The JUMPS output will be examined to identify the overpayment reason codes which contain significant portions of the receivables. Based upon this identification, the underlying personnel policies driving these overpayments will be identified.

Literature searches will be employed to determine the models used in the development of these personnel policies, and the bounds placed upon the policies. Through the use of these models, the manpower acquisition, retention and training costs and benefits will be developed.

These manpower costs and benefits will then be merged with the pay system costs and benefits in the form of a cost-benefit analysis. This analysis will then be used to determine the net savings or expenditures the Navy accrues with the implementation and use of these policies.

## II. IDENTIFICATION OF PAY-IMPACTIVE PERSONNEL POLICIES

### A. REASONS FOR OVERPAYMENTS--THE PAY SYSTEM

Within the Navy's pay system, there are nearly 90 individual pay codes. Each code identifies a distinct type of pay or allowance which can be earned by a service member.

Since each pay code identifies a separate entitlement to pay, it is possible that there could be an equal number of overpayment reason codes. The Navy Finance Center, however, has identified a set of overpayment reason codes which cover all possible overpayment categories (see Appendix A). The majority of these overpayment reason codes deal with individual entitlements; some, however, are for special situations or act as "catch-alls" for the majority of pay types that are only infrequently overpaid. The following is a list of the special situation and "catch-all" codes, with short explanations (for the full list, see Appendix A).

1. 05: Reserve Pay; an overpayment of entitlements earned while in a reserve status. The member may be separated, have converted to active status, or have remained in a reserve status.
2. 06: Retired Pay; an overpayment of a retired pay entitlement. The member may have remained on the retired rolls, or have returned to active status.
3. 09: Miscellaneous (Civilian); overpayments or charges for materials or services against a civilian employee of the Department of the Navy.
4. 13: Dishonored Checks; a receivable established when a member makes payment on an obligation by check, and the check is not honored by the financial institution on which it is written.
5. 14: Fraud, Keyport, Wa.; a special overpayment code established to collect monies fraudulently obtained, which were identified in a specific investigation.
6. 24: Multiple Entitlements; the overpayment code used when the debt is the result of overpayments on more than one entitlement, and no single entitlement accounts for the majority of the overpaid amount.
7. 25: Pay, Miscellaneous; the overpayment reason code used when no other code applies. Should a single entitlement begin to be used frequently, a new overpayment code would be programmed.

At NFC, the final balancing of MMPA's occurs in the Accounts Processing Department. When an overpayment at separation is identified, a case jacket is opened, and the specific entitlements overpaid are identified. The case jacket is then transferred from Accounts Processing to the Accounting and Finance Department.

Among Accounting and Finance's responsibilities are the maintenance of the accounts receivable file and debt collection. Consequently, it is here that the out-of-service debt case is placed on the accounts receivable file.

This file is computerized, allowing searches of the file data to provide management information. It was through this search capability that the overpayment totals and case totals were obtained in support of this thesis.

## **B. PREDOMINANT OVERPAYMENT CATEGORIES**

Appendix B provides the summary data, by overpayment reason code, obtained from the accounts receivable file search. The data presented represents all out-of-service debts identified during the period 1984 through, and including, 1986.

Upon review of Appendix B, it becomes obvious that some categories of overpayments represent an extremely large portion of the receivables --reenlistment bonuses are 41.95% of the dollar value, and 12% of the total number of cases. Conversely, some categories represent extremely small portions of the portfolio--travel overpayments account for less than 1% of the debt as well as less than 1% of the case count. Consequently, it is necessary that some criteria be used to select the overpayment reason codes to be analyzed.

Implicit in the scope of this thesis is the first of the criteria. Since the concern of this thesis is an examination of the personnel policies causing overpayment, the first criterion will be that the overpayment is driven by specific personnel policies. With this criterion established, three overpayment reason codes are eliminated:

1. 14 - Fraud, Keyport, Wa.
2. 24 - Pay, Multiple Entitlements: this code would also have been eliminated because of the type of overpayments it includes. No single personnel policy could be identified as a driving force in these overpayments.
3. 25 - Pay, Miscellaneous: this code would also have been eliminated for the same reasons as code 24.

The remaining criteria will be based upon general management principles; otherwise known as getting the "biggest bang for the buck." Since management attention to any problem costs money, it is necessary to find a return on this money.

In this case, using the collection data presented in Chapter I with the debt level, it is seen that collections represent about 5% of the total debt. Using this fact and the obvious desire to increase the level of collections to provide the monetary payback, the overpayment reason codes to be examined should contain a relatively high percentage

of the debt. This will allow the largest opportunity for additional collections, without the massive efforts required to closely examine each category. Therefore, the next criterion to be used, albeit somewhat arbitrarily chosen, is that the overpayment reason code must contain at least 5% of the total debt.

The final criterion to be used is based upon the average dollar value per overpayment.

The Navy Finance Center performed a management study to determine the costs of establishing a receivables case file and perform the initial actions of debtor notification. These costs were determined to be \$125.00 [Ref. 3: pg. 1]. In accordance with the Federal Claims Collection Standards [Ref. 4: para. 104.3-c], any overpayments less than or equal to this amount are automatically written off. Consequently, the dollar value per case to be used as a criterion must be significantly higher than this \$125.00 value in order to focus attention on a small enough group of debts to be able to reasonably apply the desired management attention.

Again, a somewhat arbitrary selection must be made as to a starting point to focus management attention. This selection can be tempered with some judgement, however. First, it is known that no debt initially placed in the file had a value of less than \$125.00. Additionally, the fastest way to increase the collection percentage is to find a way to collect more of the high dollar value debts. Thus the dollar value selected must be significantly larger than the \$125.00 write-off threshold, and, simultaneously, it must be small enough to capture a significant portion of the debts. Thus, for the final criterion, a value of \$1,000 per debt will be used; again, a somewhat arbitrary figure, but a reasonable starting point for management.

In review, the three criteria to be used to identify overpayment reason codes for further examination are:

1. The overpayments must be driven by identifiable personnel policies.
2. The overpayment reason code must contain at least 5% of the total debt.
3. The average overpayment within the individual reason code must be greater than \$1,000.

Through examination of Appendix B, and application of the above criteria, the overpayment reason codes for further examination can be identified.

As previously indicated, use of the first criterion eliminates three codes. Through application of the second criterion, elimination of all but four codes is accomplished. The third criterion, when applied individually, eliminates all but ten of the codes.

When the three criteria are simultaneously applied to the data contained in Appendix B, it is seen that only one overpayment reason code remains for further examination. Thus, the predominant overpayment reason code which will be further examined is Code 11, Reenlistment Bonus.

### C. PERSONNEL POLICIES DRIVING OVERPAYMENTS

In examining the policies surrounding reenlistment bonuses, it is necessary that a number of topics be considered.

First, since the average overpayment amount is so large, a review of the computation method of the bonus payments will be made. This review will identify both the overall bonus amount and the installment payment sequence in order to show the front-loading of the payments. It is this front-loading that causes the high overpayment values.

Then a review of the eligibility criteria for the bonus will be conducted. Following this the conditions requiring recoupment of the bonus payments will be analyzed. The eligibility and recoupment criteria serve to identify the population that initially earns, and subsequently loses, the reenlistment bonus.

#### 1. Bonus Computations

Reenlistment bonuses have been an established and effective method of gaining reenlistments in selected specialties for many years. The programs under which these bonuses have been awarded continue to change as needs change, but the current Selected Reenlistment Bonus (SRB) Program provides the highest dollar values in payments ever awarded. The current award levels can be as high as \$30,000. [Ref. 5: sect. 10900]

The computation of the bonus follows a specific algorithm. This algorithm, defined by the Office of the Chief of Naval Operations [Ref. 6: pg. 6], computes the payment using Equation 2.1.

$$\text{BONUS} = \text{BP} \times \text{AOS} / 12 \times \text{AL} \quad (\text{eqn 2.1})$$

In Equation 2.1,

- BP = the monthly rate of the member's Base Pay at the time of reenlistment.
- AOS = the number of months of new service the member is obligating for under the reenlistment contract (the division by 12 in the equation is to convert the months to years). Time obligated but not served from a previous contract does not qualify for SRB entitlement.

- AL = the award level established for the individual member's specialty. The award levels vary from 1 to 6.

The award levels are reviewed at least every six months to determine the specialties eligible for SRB awards, with changes to eligible specialties or award levels announced in NAVOP messages [Ref. 6: pg. 2].

Two examples of SRB computations are provided below.

The first case is an E-4 reenlisting at the end of his first four year enlistment; thus the member's pay grade is E-4 over four years of service. Additional obligated service and award levels are assumed to be 4 years and 4 respectively. With this data the computation is done as in Equation 2.2.

$$\$952.20 \times 48/12 \times 4 = \$15,235.20 \quad (\text{eqn 2.2})$$

The second situation is an E-5 reenlisting for six years at the end of his sixth year of service; in this case the applicable pay grade is E-5 over six. Additional obligated service and award level assumptions are 6 years and 6, respectively.<sup>3</sup>

The bonus amount is computed as in Equation 2.3.

$$\$1,075.20 \times 72/12 \times 6 = \$38,707.20 \quad (\text{eqn 2.3})$$

As can be seen, the award amounts can be quite substantial. Currently, however, the maximum award permitted is \$20,000 [Ref. 6: pg. 8], except for nuclear trained personnel, for whom the maximum award is \$30,000. Consequently, when the computed award exceeds the maximum allowable, the entitlement is reduced to the maximum allowable amount.

The payment schedule for the SRB entitlement is for one-half of the amount to be paid at the time of reenlistment, with the remaining amount paid in equal installments on the reenlistment anniversary date for the remaining obligated service under the contract [Ref. 5: Part 1, Chap. 9]. Thus, for example, if a member reenlisted for six years and his SRB entitlement was \$20,000, he would receive \$10,000 upon reenlisting, and \$2,000 on the anniversary date for each of the next five years.

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<sup>3</sup>If this member had six months of unserved, obligated time from a previous extension, his additional obligated service would be 66 (72 less the six unserved).



This example demonstrates the front-loading of the payments. Prior to serving any of the obligated service under the new enlistment contract, the member has received 50% of the full entitlement. For the remaining periods, the time served with percentages, versus the payments received with percentages, are as follows:

- First anniversary: 1 year, 16.7%; \$12,000, 60%
- Second anniversary: 2 years, 33.3%; \$14,000, 70%
- Third anniversary: 3 years, 50%; \$16,000, 80%
- Fourth anniversary: 4 years, 66.7%; \$18,000, 90%
- Fifth anniversary: 5 years, 83.3%; \$20,000, 100%.

From the above time served versus payments received schedule, it is plain that the payments are significantly front-loaded, with the impact of this payment pattern being reduced as the term of the reenlistment contract is served.

Graphically, the payment schedule is displayed in Figure 2.1.

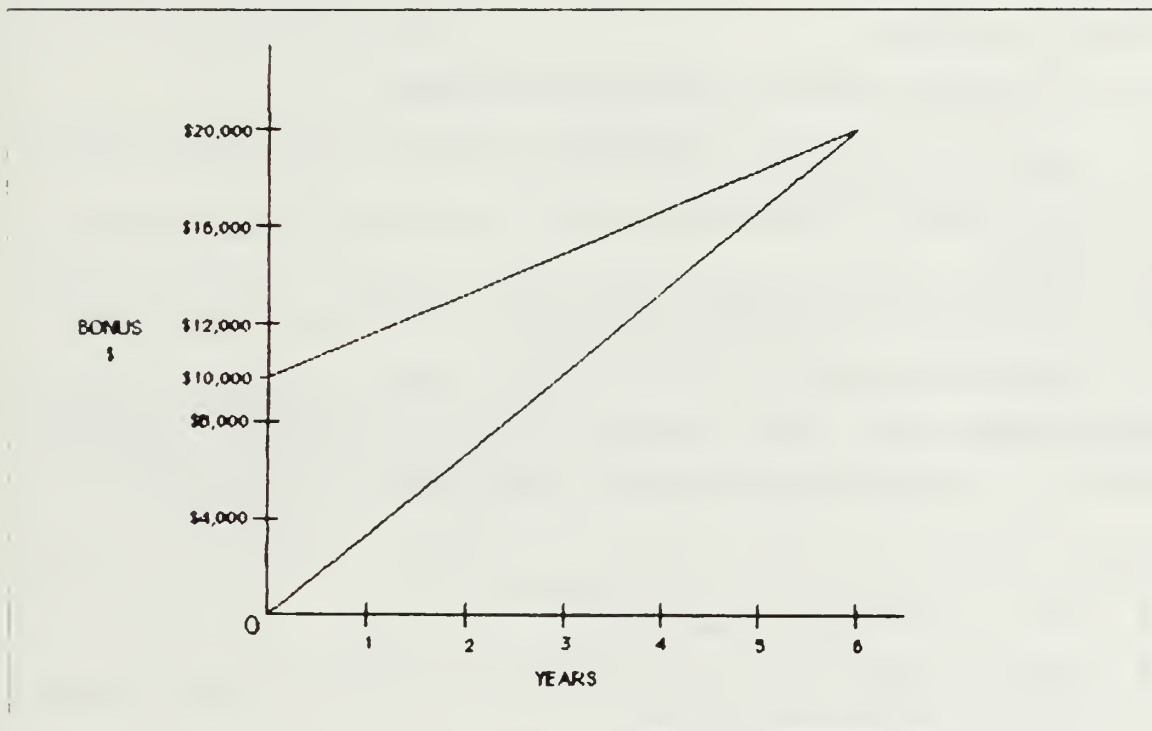


Figure 2.1 Bonus Payments Versus Time Served Percentage.

The ray bisecting the origin of the graph represents the condition where the bonus money is paid as the reenlistment period is served. The ray starting at the 50% value on the y-axis represents the current, front-loaded payment schedule.

## 2. Eligibility and Recoupment Criteria

The eligibility and recoupment criteria for SRB entitlements are specified in the OPNAV instruction on "Enlisted Bonus and Special Duty Assignment Pay Programs" [Ref. 6: pgs. 2, 3, and 6].

Eligibility criteria are of two types - General and Specific. The Specific criteria are further divided into those for active duty members and those for members with broken service.

The General criteria are:

- Completion of at least 21 months of continuous service, but not more than 14 years.
- Be qualified to reenlist or extend for three or more years.
- Have not received, or be entitled to, readjustment, severance or separation pay.

Thus, the General criteria require the member to have served for a period long enough to have developed a performance history, and the history must qualify the member for reenlistment.

The Specific criteria add the following requirements:

- Be a petty officer, or an E-3 designated striker<sup>4</sup> (For broken service SRB, the member must be a petty officer).
- Be on active duty (Broken service SRB; have less than a four year break in service).
- Be qualified for, and serving in a SRB rating or specialty, or be approved by the Commander, Military Personnel Command.

From the Specific criteria, it can be seen that the only additional requirement over the General criteria is that the member must be performing well enough in the specialty to have attained a minimum level of responsibility through promotion.

Conversely, the recoupment criteria specify that recoupment of unearned portions of SRB is required under the following conditions:

- Loss of qualification in the bonus skill.
- Separation, either voluntarily or for reasons of misconduct, causing the member to fail to complete their enlistment.
- Separation for disability resulting from conduct not in the line of duty.

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<sup>4</sup>A designated striker is a member who has attained a specialty rating prior to making E-4. The designation may occur through receipt of formal training or through experience and passing the rating exam without scoring high enough to be rated.

The first of these criteria does not specify, as a part of the criterion, that the member is separated. In fact, loss of the specialty qualification means only that the member will serve in some other capacity for the remainder of their obligated service.

The remaining two criteria, however, specify separation as a part of the criteria. Hence these situations lead automatically to overpayment at separation. If these two situations were looked at a little closer, it might also be surmised that they would lead to a bad debt in more than the average number of cases. For the second criterion the member has separated under conditions which indicate that he is dissatisfied with the service. This situation would not be conducive to a repayment. The third criterion indicates the member may have a reduced employment opportunity; again, not conducive to debt collection.

This analysis of the situations surrounding employment of the last two criteria is only conjecture; to this author's knowledge, no studies have been conducted to validate any expected correlations.

### **3. The Personnel Policies**

From the above analysis, the pay-impactive personnel policies to be examined in detail are those surrounding the SRB Program.

It is taken as a given that the Navy will continue using bonus payments to entice personnel into additional periods of service. The requirements for eligibility for these payments, as well as for recoupment of unearned portions, have been reviewed. In the following chapter, one of the economic models used to determine the level of these payments will be used in conjunction with the NFC data to develop the costs and benefits of the SRB Program. These costs and benefits will be identified, quantified and then merged into a single analysis to determine the net benefit.

### III. DATA DEVELOPMENT AND ANALYSIS

The initial step in performing a cost-benefit analysis is, obviously, the development of the costs and benefits. Although this seems like it may be a routine academic drill, this development process is the crux of the analysis. Without, first, properly identifying these items, and then accurately assigning monetary values to each, the remainder of the analysis becomes a mathematical exercise of little value. Hence, the initial part of this chapter will be concerned with the development of the costs associated with the Selected Reenlistment Bonus Program. Next will be the development of the individual elements of savings. These two data sets will be merged into a discounted cost-benefit analysis. A sensitivity analysis will then be conducted to look at potential impacts caused by assumptions used in the development of the data. Finally, some of the externalities involved, with indication of the effects these factors would have had on the analysis had they been included, will be discussed.

#### A. DEVELOPMENT OF COST ELEMENTS

The individual cost elements fall into two categories. The first category involves the costs incurred by the Navy Finance Center in the operation of the accounts receivable file and in their collection efforts. These costs, though, are applicable to all debts, not just to those involving reenlistment bonuses. Consequently, these costs will need to be apportioned between the various overpayment reason codes. The second category involves costs which are specifically related to the reenlistment bonuses. There are also two types of costs involved here. First, are the costs to run the overall program, and, secondly, the costs inherent in the individual reenlistments. These two types of costs, as well as the NFC costs, must all be valued in a manner which can be properly used in the final analysis.

##### 1. Navy Finance Center Costs

There are three principal costs involved at NFC in the operation of the receivables file and collection efforts. [Ref. 3: pg. 1]

###### *a. Computer System Hardware Costs*

Predominantly, these are sunk costs, that is, they are required costs in the operation of the Navy Finance Center. The Finance Center could not reasonably maintain the pay records of half of a million active duty personnel plus all the reserve,

retired and annuitant records without the computer system. Hence, the vast majority of these costs are not relevant to this analysis.

There are specific costs for computer hardware which apply solely to the collection of debts, however. These costs are items such as the remote terminals used for debt collection actions, maintenance of these terminals, and the differential costs for common equipment (e.g., printers, tape drives, disc drives) in excess of the requirements for all other operations.

The annual cost, for debt collection computer hardware, as defined by NFC, is \$ 103,856.75.

*b. Computer Program Development and Maintenance Costs*

In the operation of any computer system, the programming determines, to a large degree, the efficiency and flexibility of the system. This is true of the NFC system as well; hence costs are incurred on an annual basis in the development and maintenance of the programming. These annualized costs have also been determined, and are \$ 25,318.24.

*c. Costs of Collection Efforts*

The Navy Finance Center has also determined the annual costs of collection efforts. These amount to \$ 732,907.82.

The collection efforts' costs include such items as computer operation, personnel costs, administrative costs and the costs of supplies.

*d. Apportionment of Navy Finance Center Costs*

Each of the cost categories above represent total efforts cost, that is, these are the costs to operate the receivables file and collection efforts for all overpaid at separation accounts. Since the reenlistment bonus overpayments represent only a fraction of the accounts, it is necessary to determine how much of these costs apply to this overpayment reason code.

Since the reenlistment bonus overpayment reason code contains approximately 42% of the total debt, this proportion could be used for assigning costs.

The question that must be answered, however, is how are these overpayments handled by NFC--both within the computer system and manually. Under both processing situations the overpayments are dealt with as individual cases; control is provided by the individual debtor's social security number. Since this is the situation, the debt percentage is inappropriate for use in apportionment. The reasonable apportionment percentage to use is the percentage of total cases represented by the specific overpayment reason code.

The percentage of the total cases, represented by the reenlistment bonus overpayment reason code (Code 11), is 12.0463%. Employing this percentage, the annual cost apportionment for the three categories at NFC is as follows:

- Computer Hardware Costs: \$ 12,510.90
- Program Development Costs: \$ 3,049.91
- Collection Efforts: \$ 88,288.27.

Thus, the total annual costs for NFC are \$ 103,849.09.

## **2. Reenlistment Bonus Related Costs**

The costs related directly to the bonuses cover items such as the compensation difference between a higher grade petty officer that reenlists versus a recruit that would replace the separated member, the amount of money paid out in reenlistment bonuses, attrition rates for the two groups, and the difference in productivity between the two groups.

Each of the costs will be developed individually. Some will be on a per reenlistee basis, while others will be on an annual basis.

In addition, for the development of some of these costs, it is necessary to use reasonable assumptions. Necessarily, the inclusion of assumptions impacts on the validity of the analysis. To reduce this impact, the final phase of the analysis will be a sensitivity analysis, where the assumptions will be varied to determine the potential impacts of each assumption on the overall analysis.

### ***a. Compensation Differential***

(1) *Direct Compensation.* In the development of this cost, it is necessary to consider the time involved in each enlistment, the requirements for promotion leading to pay changes during each enlistment, the promotion flow points, the pay scales for each potential pay grade held, and the promotion patterns expected within the population in question.

Since most of the above considerations deal with promotion of the members involved, the first topic to be dealt with is the type of promotion opportunity or pattern that is relevant. This pattern derives directly from the same criteria used to place a specialty within the Selected Reenlistment Bonus Program. Specifically, each of these specialty areas are undermanned, thus their inclusion in the bonus program. Although not always true, undermanning within a rate or specialty usually means a higher promotion opportunity. This follows from the Navy's quota system for promotions, where undermanning leads to a larger number of vacancies in the higher pay grades, providing more openings in the higher grades, and, thus, faster promotions.

This same promotion pattern holds for the lower pay grades (E1 to E4), though for different reasons. As an enticement to better performance in the training phases of the new enlistee's service, while the member is in training schools, promotions are made easier. Promotions are awarded as time in grade (TIG) and time in service (TIS) requirements are met - assuming the member meets the performance standards established for promotion while in the training phase. This not only serves to reward the positive performance in school, but also ensures the member becomes designated to work in the specific specialty required by the Navy, and for which the Navy is training him.

These faster promotion opportunities lead to promotion sequences which more closely correspond to the minimum time requirements, especially in the lower grades.

To develop the promotion flow points, a review of the minimum requirements for advancement [Ref. 7] is required. Thus the minimum time a member must spend for time in grade and time in service requirements are shown in Table 1.

	TIG	TIS	TOTAL RQMT
E1 to E2	6 months	6 months	6 months
E2 to E3	6 months	12 months	1 year
E3 to E4	9 months	24 months	2 years
E4 to E5	12 months	36 months	3 years
E5 to E6	36 months	7 years	7 years
E6 to E7	36 months	11 years	11 years

The above time frames represent the absolute minimums. Since it is extremely improbable that a large population can all match these minimums, the assumptions mentioned earlier must begin here.

The promotion flow points used in this analysis are:

- Promotion to E2 and E3 occur at the minimum time frame.
- Promotion to E4 occurs at a time frame equal to 1.1 times the minimum.

- Promotion to E5 and higher grades occurs at a time equal to 1.5 times the minimum.

With these assumptions, the promotion flow points are as shown in Table 2.

TABLE 2	
PROMOTION FLOW POINTS	
PROMOTION	TIMING
E1 to E2	6 months
E2 to E3	1 year
E3 to E4	2 years
E4 to E5	3.5 years
E5 to E6	8 years

The next concern in the development of this cost is the rate of pay received during each year for both the first and second terms served. In order to determine this, the term of each enlistment is fixed at four years<sup>5</sup> for this analysis. Next, using these four year periods, and the promotion flow points identified above, pay scales will be fixed for each month of service. The pay scales to be used will be the current direct military compensation values. These figures were supplied by the Navy Finance Center [Ref. 8] and include all items of direct pay for actual members on active duty.

By pay grade, these monthly rates of direct compensation are as shown in Table 3.

Through combination of the above data, the annual military compensation can be determined for each year of the two enlistment terms. For example, when a new enlistee enters the service at pay grade E1, his monthly compensation is \$ 1,093.50 for the first six months and \$ 1,173.30 for the second six months following promotion to E2. His annual compensation is, then, the sum of these two figures multiplied by six, or \$ 13,600.80.

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<sup>5</sup>Reenlistments occur for periods ranging from two to six years. The mid-point has been chosen for use in this analysis.



TABLE 3  
MONTHLY DIRECT COMPENSATION RATES

GRADE	RATE
E1	\$ 1,093.50
E2	1,173.30
E3	1,310.10
E4	1,476.90
E5	1,699.20

Using the same computational method for each of the eight years yields annual compensation rates as shown in Table 4.

TABLE 4  
ANNUAL DIRECT COMPENSATION RATES

YEAR	RATE
1	\$ 13,600.80
2	15,721.20
3	17,722.80
4	19,056.60
5	20,390.40
6	20,390.40
7	20,390.40
8	20,390.40

Next, since money has value over time, it is necessary that these annual figures be adjusted to demonstrate this time value. Hence, each year's compensation figure is adjusted to a present value using a rate of 10% as the cost of money.

The present value for each four year enlistment is computed using Equation 3.1.

$$PV = \sum \frac{AC_n}{(1.10)^n} \quad (\text{eqn 3.1})$$

where:

- PV = Present Value
- AC = Annual Compensation
- n = year (1 through 8)

In the numerator in Equation 3.1, for the second enlistment, the values would be the amounts of direct annual compensation for each of the years from year five to year eight; for the first enlistment, the amounts of direct annual compensation for each year from one to four would be used.

The results for the first term give a present value of \$ 51,688.40, and yield \$ 64,634.84 for the second term. Since the cost required for the analysis is the pay differential, the cost is the difference between these two values, or \$ 12,946.43 per reenlistee.

(2) *Indirect Compensation.* In addition to the direct compensation paid each service member, other payments are made by the Navy on behalf of the member. Some of these costs are not relevant to the analysis because they are the same for all members, and, thus, it does not matter if the member is a reenlistee or a new recruit. An example of this type of cost is medical benefits. Conversely, some of these costs differ because of the differing pay grades held by the individual members. Under this condition, the costs are relevant to the analysis.

The Personal Statements of Military Compensation [Ref. 8] prepared by NFC, specify these items by pay grade.

The first, and an obvious cost, is the Social Security matching payments made by the Navy. These costs, by pay grade, are as specified in Table 5.

The other cost in this area is the cost of a member's retirement, or the compensation paid to dependents should the member die while on active duty. These figures are computed by NFC based upon military studies to determine average retirement plan and insurance costs. These costs have been determined by the Finance Center to be, by pay grade, as listed in Table 6.

TABLE 5  
SOCIAL SECURITY MATCHING PAYMENTS

PAY GRADE	MONTHLY AMOUNT
E1	\$ 47.06
E2	52.77
E3	62.55
E4	72.89
E5	85.69

TABLE 6  
COSTS OF RETIREMENT AND SURVIVOR BENEFITS

PAY GRADE	MONTHLY AMOUNT
E1	\$ 61.87
E2	69.37
E3	82.24
E4	95.83
E5	112.66

The retirement costs should be factored by the expected reenlistment rates through these enlistee's career. That is, the retirement costs per enlistee should be a percentage of the costs indicated; the percentage determined by the expected proportion of the enlistees that will continue in service until such time as they are eligible to draw retirement pay. The value specified in this thesis is used for ease of computation, and because the factoring of this cost would have little impact on the outcome.

Using the values in the above tables, and the promotion flow points previously discussed, the differential in the present values for these indirect compensation amounts can be computed using Equation 3.1.

This computation yields a differential of \$ 1,823.18 between the two enlistment terms, per reenlistee.

(3) *Bonus Compensation.* The Navy Finance Center provided the bonus data for fiscal year 1986 (1 October, 1985 to 30 September, 1986), which was obtained through the use of another inquiry of the JUMPS data base. This data will be assumed to be representative of current SRB reenlistment patterns. Additional data from the JUMPS files would be obtained only with great difficulty, since the on-line file contains only an 18 to 24 month history.

This JUMPS inquiry found that 21,986 service members reenlisted under the SRB Program. For these reenlistees, the total value of bonus money obligated was \$ 303,292,252.15.

Using the SRB bonus payment schedule discussed previously, the payments to reenlistees were made using the following pattern:

- At the time of reenlistment, one-half of the bonus is paid, or an amount of \$ 151,646,126.08.
- On each anniversary of the reenlistment (assumed to be four years), equal installments are paid. Thus, at the beginning of the second through the fourth years, the payment amounts are \$ 50,548,708.69.

Using these payment values and Equation 3.1, the present value of the bonus payments can be determined. This value is \$ 277,353,282.94.

### 3. Program Costs

In addition to the costs incurred by the Finance Center in operating the mechanized collection system, and the costs incurred in compensation differences, there are costs involved in the operation of the SRB Program which must be included in the analysis.

#### *a. NFC Bonus Pre-certification*

Because of problems encountered during the use of the SRB Program, in the correct computation of the bonus amount, a small group within the Finance Center organization was established to certify the bonus computation prior to payment in the field. This group is comprised of four personnel--two enlisted service members (pay grade E3), and two civilian pay technicians (pay grade GS-7).

The services of these four personnel are lost to the Finance Center in performing other duties, and this loss has a value. From lack of a better alternative, this value is computed at the amount of pay and benefits these employees receive. Thus, as before, both the direct and indirect compensation must be determined.

For the two active duty members, the earlier computations for pay grade E3 will be used. Consequently, the values for these two employees are \$ 1,310.10 direct compensation, and \$ 144.79 indirect compensation, yielding a total of \$ 1,454.89 per month. The yearly compensation, then, is \$ 17,458.68 per member.

In the case of the two civilian employees, an assumption concerning their within-grade level is required. It will be assumed that these personnel are at a mid-level within their grade, therefore the pay scale used will be for a GS-7 step 5.

At this pay scale, their direct compensation is \$ 20,806.00 annually. Additionally, the indirect compensation must also be considered.

The first item in this category is the matching payments made by the Navy toward the employee's retirement. These payments are distributed between the Federal Retirement System and Social Security, the total of which is 7% of the employees annual salary. In this case, that amounts to \$ 1,457.40 per employee per year, or \$ 2,914.80 annually for the two employees.

The other areas of indirect compensation include employee health and life insurance, for which the Navy pays prescribed percentages of the total cost. Using the algorithms in the Federal Personnel Manuals for these benefits, the costs are computed to be \$ 17.04 annually for life insurance and \$ 390.72 annually for health insurance. The total Navy contribution, then, is \$ 407.76 per year per employee, or \$ 815.52 total.

Thus, the total indirect compensation for these two employees can be computed as an annual amount of \$ 3,730.32.

#### *b. Reenlistee Attrition*

As with any large group of military personnel, the SRB reenlistees experience some losses in their numbers from attrition. Although not of significance to this thesis, they attrite for various reasons which include such items as family hardship requiring the individuals presence at home, medical discharges and discharges caused by poor military performance.

Within a study done to determine optimal, constrained reenlistment bonuses, [Ref. 9: pg. D-2], the attrition rates for reenlistees were determined to be:

- During year 5 (first year of reenlistment), essentially zero.
- In each of the following three years, 3%.

Thus, replacement personnel, to maintain manning levels despite the attrition, must be recruited.

These newly recruited personnel, however, also experience attrition [Ref. 9: pg. D-2]. This requires larger numbers of recruits to replace the lost reenlistees than the number of reenlistees that leave the service.

The attrition for the recruits is as shown in Table 7.

PERIOD	ATTRITION %
Recruit Training	12.0%
"A" School	1.4%
Thru 2nd Year	5.0%
Thru 3rd Year	5.0%
Thru 4th Year	5.0%

Thus, to maintain manning at the 21,986 that were initially reenlisted, the Navy must recruit enough new personnel to both replace the attrition of the reenlistees and the attrition of the recruits used as replacements. During the first year of the reenlistment period, attrition of the second term personnel is zero, therefore no additional recruits are required. During the remaining three years of the second term, however, the attrition rates must be compensated for, thereby requiring additional recruits. The levels of recruits required to replace the attrited members are provided in Table 8.

YR OF 2ND TERM	2ND TERM ATTRITION	QTY RECRUITS RQRD
2	660	762
3	640	777
4	620	789

Thus, in the words of the economist, assuming all else is equal, Table 8 gives the number of recruits that will be required to replace the second term attrition. As is usually the case, however, all else is not equal. The productivity level of second term personnel is significantly higher than for first term personnel. This fact will also require additional recruits to fill the openings made through reenlistee attrition.

The productivity differential between first and second termers [Ref. 9: pgs. 10-11] is significant, and has been determined to be 1.5 to 1.0. Stated differently, it takes 1.5 first term personnel to accomplish the same amount of work performed by one second term.

Thus the number of recruits required per Table 8 is actually understated. The proper numbers can be found by multiplying each of the figures in the table by 1.5. This results in actual requirements for recruits of 1,143 in the second year, 1,166 in the third year, and 1,184 in the final year.

The next requirement is to quantify the costs involved in obtaining these recruits. These costs can be divided into three specific categories - recruiting and processing, training, and compensation.

The recruiting and processing costs, as well as the training costs [Ref. 9: pgs. 8, D-1, and D-2], have been previously determined. Unfortunately, these costs were computed for 1983, while the remainder of the costs used in this thesis are from 1986. Consequently it is necessary to inflate these 1983 costs to 1986 values. This will be accomplished using the Consumer Price Index. [Ref. 10: pg. 10].

(1) *Recruiting and Processing Costs.* The recruiting costs per individual recruited are \$ 4,304 (1983), which inflates to \$ 4,709.01; and the Armed Forces Entrance Examining Station (AFEES) processing costs were \$ 179.00, which inflates to \$ 195.84. Thus, the per recruit costs for this category are \$ 4,904.85.

Using this figure with the actual requirements for recruits each year provides costs as follows:

- Year 2: \$ 5,606,243.55
- Year 3: \$ 5,719,055.10
- Year 4: \$ 5,807,342.40

Using these values in Equation 3.1 yields a present value of \$ 14,186,219.17 for recruiting and processing costs.

(2) *Training Costs.* In this area, two separate costs are applicable. First is the basic recruit training, with the other being "A" School.<sup>6</sup>

The recruit training costs in 1983 were \$ 2,815.00, which inflates to \$ 3,079.89 per recruit. The "A" School costs averaged \$ 5,778.61 in 1983, and, with the inflation factor, \$ 6,322.38 in 1986.

Thus the total training costs per recruit are \$ 9,402.27. Applying this cost to the recruit requirement each year yields \$ 10,746,794.61 for year 2, \$ 10,963,046.82 in the third year, and \$ 11,132,287.68 in the final year. Using Equation 3.1 with these figures gives a present value for training costs of \$ 27,210,398.69.

(3) *Compensation Costs.* Earlier in this chapter, the cost differential between the compensation amounts for a reenlistee versus a recruit were determined. Although still valid, an adjustment of these costs is required due to the attrition conditions. Since, with attrition, the higher pay levels of the second termers are lost, the differential must be reduced by the number of reenlistees that attrite. An additional correction must be made to add in the compensation of the additional recruits required over the number of the second termers that attrite.

The differential is computed considering the year in which attrition occurs, and is computed for that year plus any remaining time in the four year period of the enlistment. The costs of the additional recruits needed are also computed with regard to the year in which they are required. These costs are then determined for each succeeding year of the enlistment period, with the losses due to attrition accounted for.

The costs incurred in this area, on an annual basis, are \$ 1,204,209.90 in the second year, \$ 5,352,904.08 for year three, and \$ 12,213,266.52 in the final year. When utilized with Equation 3.1, these costs yield a present value of \$ 14,694,631.84.

#### 4. Summary of Cost Elements

The number and variety of the cost elements within this analysis could easily be confusing. Consequently, to provide ease in compiling the elements for the final analysis, the cost elements are summarized in Appendix C.

For each element, the present value over the four year term of the enlistment is given, and the order of their presentation in the Appendix follows that of the text.

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<sup>6</sup>"A" School provides the basic specialty training.



## **B. DEVELOPMENT OF BENEFIT ELEMENTS**

With the cost side of the analysis complete, it is necessary to identify and quantify the benefits of the SRB Program.

The benefits all deal with savings attained through the reenlistment of trained, experienced personnel. Hence, the number of personnel becomes a critical factor in this portion of the analysis. And, because of criticality, the quantity of personnel will be identified relative to each of the elements constituting a benefit.

As might be expected, since the value of the benefits is contingent upon numbers of personnel, the benefits are such items as savings on recruiting costs, training costs, reduced attrition, and improved productivity.

### **1. Recruiting and Processing Cost Savings**

When a member reenlists, he continues to fill a manpower requirement. Without this reenlistment, the Navy would need a recruit to fill the vacancy, thus maintaining the manning level. And, as identified previously, the recruiting and in-processing of a new member costs the Navy money.

As previously determined, the 1986 cost of recruiting a single service member is \$ 4,709.01, and the processing cost for this individual is \$ 195.84. This totals to \$ 4,904.85 to recruit and process an individual into the Navy.

With the number of individuals reenlisting under the SRB Program, 21,986, this represents a total savings of \$ 107,838,032.10 - a single year savings.

### **2. Training Cost Savings**

When these newly recruited members enter the Navy, the first obligation is to train them to be productive. Again, the initial training is through Recruit Training (Boot Camp), followed by "A" School. The costs involved in these two training efforts were previously defined to be \$ 3,079.89 for Recruit Training, and an average cost of \$ 6,322.38 for "A" School. The total training costs, then, would be \$ 9,402.27 per recruited member.

Using the number of reenlistees, the total savings are \$ 206,718,308.20, another single year savings.

### **3. Attrition Cost Savings**

The attrition rates for newly recruited personnel were provided in Table 7. This table showed that during the first year (Recruit Training and "A" School), 13.4% of the recruits will leave the service. Additionally, in each succeeding year of the reenlistment period another 5.0% will attrite.

This provides an annually compounding problem for maintaining manning levels.

In year 1 the Navy will need to recruit approximately 15% over the number required in order to maintain the manning level. In year 2, an additional 5% of the first year's remaining recruits will attrite, thus the Navy will need to recruit to replace these personnel. This pattern continues through the whole of the four year enlistment period. Thus the numbers of personnel that must be recruited to overcome this attrition, and maintain manning levels for the four year period, assuming the requirement is 21,986 personnel, are shown in Table 9.

TABLE 9  
ATTRITION REPLACEMENT

YEAR	RQMTS	EXCESS
1	25,284	3,402
2	1,269	1,269
3	1,269	1,269
4	1,269	1,269

The column labelled "EXCESS" indicates the number of these recruits which exceed the number of reenlistees, and, thus, represent additional savings.

It should be noted that the costs involved in the attrition of the reenlistees was computed separately, as a cost element, and, therefore, are not included in this portion of the analysis.

In reviewing Table 9, it is seen that the entries in the "EXCESS" column multiplied by the cost of recruiting and training initial service personnel represents the savings based on attrition. Thus, these values are \$ 48,676,224.24 in the first year, and \$ 18,157,004.28 for each of the remaining three years of the period.

Using these values with Equation 3.1 yields a present value of \$ 85,300,005.89.

#### 4. Productivity Savings

As previously identified, the relative productivity of second term personnel is 1.5 times that of the first termers. Thus, not only are the previous savings realized, but they are understated.

To accomplish the same level of output, it would require 1.5 times the number of recruits as reenlistees. To determine the cost savings, therefore, it is necessary to multiple each of the values in the "RQMTS" column of Table 9 by the 0.5 additional requirement factor, and apply recruiting, processing, training, and compensation costs to this product. This will provide the annual savings, accounting for attrition, from productivity.

Computed, these values are \$ 370,339,046.20 in the first year, \$ 239,285,244.18 in year two, \$ 279,288,551.18 in year three, and \$ 310,917,822.48 in the final year. This yields a present value of \$ 956,622,938.90.

### **5. Summary of Savings Elements**

Just as the cost elements were summarized in Appendix C, the benefits have been summarized in Appendix D.

## **C. ANALYSIS**

After determination of the applicable cost and benefit data, little remains in performing the actual analysis. In fact, the only thing left to do is an algebraic summation of all the costs and benefits.

That summation, then, will be completed next. Following that, a short discussion of one pair of the elements will be conducted relative to their valuation validity.

### **1. Data Summation**

The easiest method to utilize in the algebraic summation of the data is to just add all the costs together, then add all the benefits together, and, finally, subtract the smaller sum from the larger.

Since, in Appendices C and D, the two additions have already been completed, all that remains is the subtraction. Thus, by subtracting the costs from the benefits, it is seen that the Navy, through the use of the SRB Program, generates a net benefit whose present value is \$ 48,822,638.63. This, then, provides a net benefit to the Navy of \$ 2,220.64 per reenlistee, using the 21,986 reenlistee figure utilized in the computations.

### **2. Base Reenlistment Rate Comparison**

The above analysis is performed under the assumption that the total population of reenlistments is the required basis to determine the benefit derived from the SRB Program. In fact, however, some of the reenlistees would continue in service if there were no SRB Program. Consequently, the true number of reenlistments of concern are the additional reenlistments induced by the bonus payment.

To determine the quantity of these additional reenlistments, it is necessary to know the base reenlistment rate within the SRB eligible population. The base rate is not directly available, however, since there has been a bonus program available for a number of years, both SRB and its' predecessor, the Variable Reenlistment Bonus (VRB) Program. Thus, it becomes necessary to mathematically determine the base reenlistment rate.

In a previous study to determine the optimal bonus levels, an equation was developed to compute the reenlistment rate under the optimal bonus conditions [Ref. 9: pg. E-1]. The equation is provided as Equation 3.2.

$$R = \frac{e^{a+b}}{1 + e^{a+b}} \quad (\text{eqn 3.2})$$

where:

- R = Reenlistment rate.
- a = Intercept coefficient (Base Reenlistment Rate).
- b = Responsiveness of reenlistments to pay changes.

Using Equation 3.2, with values for pay responsiveness and actual reenlistment rates [Ref. 9: pgs. D-1 and F-2], the base reenlistment rate can be computed. Using this data, the base rate is determined to be 6.82%, and the additional reenlistments induced by the bonus payments represent the remainder of the reenlistment rate, or 24.00%. Thus, 77.87% of the 21,986 reenlistments used in this thesis were induced by the bonus.

Applying this inducement rate to the costs and benefits computed in this thesis for the SRB Program, paying attention only to those items impacted by the number of reenlistees, the results of the SRB Program are a net cost of \$ 23,321,020.28.

The outcome goes from a net benefit to a net cost due to the cost factors which are not impacted by the number of induced reenlistments. Specifically, and primarily, the single cost factor causing this reversal is the bonus payments. Since all personnel that reenlist receive the bonus, but only 77.87% reenlist because of this monetary inducement, the bonuses for the remaining 22.13% remain a cost of the Program.

### 3. A Valuation Question

In the development of both costs and benefits, the factor "productivity" was reviewed, as well as the costs and benefits determined for the factor. In the determination of valuation for this factor, the productivity of 1.5 to 1.0 for second term personnel over first term enlistees was considered. Using this factor, it was assumed that 150% of the number of reenlistees would have to be recruited in new personnel to provide the same productivity. Thus, by increasing the value of the cost or benefit derived through the addition of 50% more recruit personnel to manning, the computation for the valuation of productivity was completed.

Although this may be theoretically correct, it is legally an impossibility. Manning levels are established by Congress as law, so this could not be accomplished since it would exceed authorized manning levels.

Consequently, an alternative valuation method needs to be developed, and the results of that analysis reviewed under that method. And, with the alternative valuation, significant impacts on the results of the analysis can be expected.

### 4. Alternate Valuation

Based on the manning level constraint in law, it is necessary to develop some other valuation method for productivity. The selected method must not only recognize the limitation on manning level, but must also accurately reflect the proportionate increase in productivity from the reenlistees, and lend itself to the identification and quantification of inter-element cost and benefit impacts.

The method selected to meet these requirements is nearly a reversal from the original valuation assumption. Instead of using 1.5 times the number of recruits to replace reenlistees, the new method will :

- Replace the reenlistees with an equal number of recruits, recognizing the various costs involved, and the different attrition rates for the two groups.
- Value the recruit's total annual cost (total compensation) at its computed cost plus the compensation differential between a recruit and a reenlistee. This differential represents the premium the Navy is willing to pay for the additional productivity.

Thus, the annual cost of a recruit in each of the four years of the enlistment term will be as shown in Table 10.

Utilizing these values will change both cost and benefit elements. For the sake of brevity, the new computations are not presented, since this represents only a valuation change in the previous computations.

TABLE 10  
ALTERNATE VALUATION

YEAR	COST
1	\$ 24,876.55
2	25,815.26
3	28,103.42
4	29,615.60

The new cost elements have been summarized in Appendix E, and the new savings elements in Appendix F. The categories for the cost elements have been adjusted slightly to compute total compensation (direct, indirect, and bonus payments) to shorten computational requirements. The "Bonus Compensation" category contains only the earned portions of bonuses for attrited members, since this was not captured otherwise. In savings, the only change is in the category "Productivity". This value now represents only the premium amount the Navy is paying to get the reenlistees, that is, the costs of recruiting, processing and training are no longer applicable.

By subtracting the total costs from the total savings under the alternate valuation model, the net savings to the Navy are \$ 482,770,265.76.

This value is considerably different than the computed value under the initial valuation assumptions. The cause of this difference is the substantial variation between the two analyses relative to the number of personnel. In the first case, no ceiling exists. Thus the full number of new enlistees required to obtain the same productivity level as that provided by the reenlistees is incorporated into the analysis. Under the alternate valuation method, the ceiling precludes adding additional personnel. Thus, the costs represented by personnel are significantly less under the alternate valuation model, and the net benefit is substantially greater.

This value is considerably different than the computed value under the initial assumption of valuation. The cause of this difference is the substantial variation between the two analyses relative to the number of personnel. In the first case, no ceiling exists, thus the full number of new enlistees required to obtain the same productivity level as that provided by the reenlistees, is incorporated into the analysis. Under the alternate valuation method, the ceiling precludes adding additional

personnel. Thus, the costs represented by personnel are significantly less under the alternate valuation model, and the net benefit is substantially greater.

#### **D. SENSITIVITY ANALYSIS**

Effectively, one portion of the sensitivity analysis was just completed when the alternate valuation model for productivity was computed. This, however, is not what is usually meant by sensitivity analysis.

There are three levels of sensitivity analysis [Ref. 11: pgs. 141-150] which are (from least to most rigorous):

- Subjective Estimates - an estimation (educated guess) of the range of error.
- Selective Sensitivity Analysis - net present values are computed based upon the analyst's estimation of likely high and low values for parameters he feels are most likely to be in error, and are likely to significantly impact the computations. This yields high, low, and most likely values for the net present value.
- General Sensitivity Analysis - accomplished utilizing a probability distribution of potential net present value outcomes.

For this thesis, a Selective Sensitivity Analysis will be performed.

This analysis will be accomplished in two steps. First, the cost and benefit elements that are to be changed will be identified, and the high and low values will be assigned. Then the net present values will be computed.

The actual computations will not be provided herein, but could be duplicated by following the work in the original analysis, while using the new values identified.

##### **1. Alternate Cost-Benefit Assumptions**

The identification of the alternate assumptions will follow the order of presentation in the initial analysis. Only those elements which present the highest potential for error, and would tend to significantly impact the results of the analysis, will be identified. All others can be assumed to have no alternate assumption of value.

###### ***a. Cost Element: Attrition Rate***

The attrition rates used in the analysis [Ref. 9: pg. D-2] were determined using a specific time frame. It is impossible to be certain, without considerably more data, if these rates are constant over time. Thus, to provide a measure of sensitivity to variations in these rates, the analysis will be conducted using values for attrition which are 20% above and below the cited values.

With the attrition rate of second termers increased by 20%, the present value of the recruiting, processing, training, and compensation costs is \$ 62,619,767.93.

With the rate decreased by 20%, the present value is \$ 40,408,598.82.

*b. Benefit Element: Quantity of Reenlistees*

Although none of the specific elements in the benefit portion of the analysis is titled "Quantity of Reenlistees", all four of the benefit elements depend upon this number for their valuation. Further, since the number of reenlistees used in the analysis was based upon a single year's data, it obviously is subject to considerable error potential.

Reenlistment rates can change based upon differences in many factors such as the condition of the economy, perceived changes in opportunities in the service versus outside, and the rate of growth of military compensation relative to the inflation rate. With these and many other factors influencing the rates, it can be assumed that the number of reenlistees used in the analysis could well be in error.

Consequently, this number will be varied by 25% in either direction, and the total present value for all four benefits will be recomputed.

This computation, when the number of reenlistees is increased by 25%, yields a present value of \$ 1,531,542,362.30; and, when the number is reduced by 25%, it yields \$ 920,559,032.70.

*c. Sensitivity of Net Present Value*

Although only five elements (one cost and all benefit elements) were adjusted for the sensitivity analysis, other elements in the original computation are likely to change. For instance, the timing of promotions is likely to be different than the assumed promotion flowpoints. The promotion flowpoint changes, however, do little to impact the overall net present value of the analysis.

The promotions would have to occur at times significantly different from those assumed to make any real difference in the cost data. Additionally, the promotions which would be most likely to change are from E3 to E4 and E4 to E5. These promotion flowpoints are near the end of the four year period, and the discounting will further decrease the impact.

The above description represents the type of analysis used to determine the factors to include in the sensitivity analysis. Through the use of this type of analysis, the five elements adjusted, were decided upon, and the remainder were eliminated.

In reviewing the outcome of the basic analysis and the sensitivity analysis, the high, most likely, and low net present values are:

- High:                 \$ 268,164,397.68 (net benefit)
- Most Likely:        \$ 48,822,638.63 (net benefit)
- Low:                 \$ 365,030,101.03 (net cost)



These values are based upon the valuation assumption from the original analysis. If the alternate valuation model for productivity were used, these values would be significantly different, as they were for the original analysis and valuation change.

## E. EXTERNALITIES

The term externalities is comprised of two separate items - external costs and external benefits.

External benefits may be defined as benefits involuntarily received by others for which they pay nothing. External costs are similarly defined as costs imposed on others without compensation. [Ref. 11: pg. 33]

Thus, in a review of externalities, it is necessary to look at both the costs and the benefits.

Any time a cost-benefit analysis is done concerning the military, there are some general types of externalities which enter into the equation. The initial external benefit is the national defense. And, although the SRB Program, in itself, does not provide this benefit, it is a contributor by maintaining experienced personnel in the service. Thus, some portion of this benefit to the general society must accrue to this analysis.

There also exist some similar, general costs to society. The military represents costs to maintain, while it produces no tangible goods for society's consumption. The military members, themselves, often pay reduced taxes, or no taxes at all to the state and local governments. Thus, these local revenues are decreased. And the military installations administering the SRB Program pay no taxes at all to the state and local governments. This also reduces their tax revenues. On the other hand, these installations represent employers, thus providing input to the local economies through salary payments, as well as being purchasers of goods and services in the local market.

The federal government also experiences some loss in tax revenues. The allowances<sup>7</sup> paid the reenlistees are at a higher level than would be paid to newly recruited personnel, and these allowances are not taxed. Thus the tax revenues lost from this differential represent a cost to the federal government.

Another cost, which is relatively large, is the interest on the money classified as out-of-service debt. Even at today's relatively low interest rates, this interest costs the federal government over \$ 1 million annually for out-of-service debt from reenlistment bonuses alone.

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<sup>7</sup>Basic Allowance for Quarters, Variable Housing Allowance, Subsistence Allowances, and Overseas Cost of Living and Housing Allowances.

Thus, external costs and benefits do accrue to the local, state, and federal governments, as well as to society as a whole. These costs and benefits would each be extremely difficult to place a value on, but their existence is a certainty. Since this analysis deals solely with those items accruing to the Navy, however, these items are not incorporated into this analysis, but are presented for the benefit of the reader.

#### IV. THE DEBT COLLECTION ACT AND NAVY DEBT COLLECTION INITIATIVES

In Chapter III, the policies surrounding the Selected Reenlistment Bonus Program were reviewed. In this review the individual cost and benefit elements were identified and quantified, and then analyzed in a cost-benefit analysis.

Regardless of the outcome of this analysis, though, the reduction of the level of debt currently being experienced remains a serious problem.

From the definition of the costs in the SRB Program, some obvious changes could be made to reduce the debt generated by this Program. One example, taken to the extreme, would be to pay the bonus amount as it is earned, that is, on each payday, give the member one-half of a month's bonus payment with his normal pay. This will obviously reduce the overpayment, but will just as certainly reduce the number of reenlistments. In order to maintain the current number of reenlistments, using this or any other variation in the payment schedule, it would be necessary to determine the level of bonus payments under the proposed new schedule that provides equal value to the reenlistees.

Although the largest, SRB is not the only contributor to the out-of-service debt portfolio. Consequently, the Navy must utilize methods which are effective for collection from all categories of the out-of-service debt. Additionally, the collection of these debts has received attention from areas outside the Navy. Specifically, debts owed the federal government is a topic of concern to the Congress, regardless of the specific agency to which the debt is due.

Congressional concern led, in 1982, to an increase in the scope of actions allowed to be used in the collection of debts due the government. This scope increase is specified in the Debt Collection Act of 1982 [Ref. 12], and is the initial concern of this Chapter.

Following a review of the Act, the initiatives of the Navy Finance Center will be reviewed to determine their compliance schedule. The final section of this chapter will provide estimates of the impacts of the Act's initiatives.

## A. THE DEBT COLLECTION ACT OF 1982

The purpose of the Act,

To increase the efficiency of Government-wide efforts to collect debts owed the United States, and to provide additional procedures for the collection of debts owed the United States, [Ref. 12: pg. 1749]

is specified as the initial statement of purpose within the Act itself.

Although the impacts on efficiency of debt collection could be argued,<sup>8</sup> little argument could be offered relative to potential increases in the effectiveness of debt collection.

It is exactly the elements that could improve effectiveness, specified in the Act, that are presented herein.

### 1. Disclosure to Consumer Credit Reporting Agencies

The first scope increase authorized by the Act is authority for government agencies to report past due debts to consumer reporting agencies (Credit Bureaus).

Although this reporting does little directly to collect debts, there is a significant impact on the debtor when he attempts to get consumer credit such as a home or car loan. The potential lender discovers, during a routine credit check, that the individual has an outstanding, past-due debt. Denial of the loan would then be a normal course of action.

This situation leads many of the debtors, after inquiring why the loan was refused, to contact the Navy Finance Center. This contact, in turn, allows verification of the debtor's current address, as well as the beginning of dialogue between the agency and the debtor (a dialogue, in the author's experience at NFC, which often begins rather heatedly).

### 2. Salary Offset for Federal Employees and Military Personnel

The second scope increase allows an agency to attach a portion of the pay of a debtor currently working for the federal government in either a civilian or military capacity.

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<sup>8</sup>Even though the Act provides additional collection methods, it also specifies additional redress possibilities for the debtor. These include rights to copies of all government data concerning the debt, the opportunity to argue the validity of the debt, additional opportunities to request waiving the debt, and the opportunity to present arguments concerning the debt's validity before an administrative law judge.

This provides authority, following a records match between the two agencies to identify the debtor, to withhold up to 15% of the debtor's disposable pay<sup>9</sup> until the debt is completely liquidated. It also authorizes this withholding on any type of pay the debtor receives; that is, withholding can be accomplished from base pay, special pay, incentive pay, retired or retainer pay, or any other authorized pay. Additionally, this provides authority to have the Internal Revenue Service remit tax refunds to the agency with whom the debtor has a delinquent account.

### **3. Notification of Agency Heads Controlling Federal Loan Programs**

The authority to notify agency heads controlling federal loan programs provides little in the way of repayment incentives, unless the debtor is requesting a loan or loan guarantee from a federal agency. The future may demonstrate this to be effective in the case of ex-military debtors attempting to gain a Veteran's Administration Home Loan guarantee; for the present, however, this scope increase is aimed primarily at reducing future delinquencies.

### **4. Interest and Administrative Fees**

The charging of interest and administrative fees on debts also does little to incentivize repayment, although it does provide incentive, once repayment has begun, to complete repayment more rapidly.

This authority does, however, provide reimbursement, to a limited degree, to cover the government's costs in maintaining the collectibles file, conducting collection activities and paying the interest on the money the government borrows while the debt is outstanding. And, just like standard lending institutions, provisions have been made to charge penalties on late payments, and charge no interest on amounts repaid within thirty days of debt notification.

### **5. Use of Collection Agencies**

The final scope increase authorized by the Act is the use, through contracts for collection services, of collection agencies.

The law allows the debtor information to be passed to the collection agency under contract to the government agency. Further, the head of the government agency is authorized to contract, on behalf of his agency, for these collection services, with the fees charged being payable from the amounts collected.

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<sup>9</sup>Disposable pay, as defined by the Act, is that part of pay remaining after the deduction from those earnings of any amount required by law to be withheld.

## **B. NAVY FINANCE CENTER DEBT COLLECTION INITIATIVES**

The preceding section reviewed the different aspects of the Debt Collection Act. The authority to proceed, however, accomplishes nothing on its own. Hence, this section will review the initiatives of the Navy Finance Center, aimed at implementation of the Act [Ref. 2].

### **1. Completed Initiatives**

Many of the elements of the Act have been implemented within the computerized receivables and debt collection systems at the Navy Finance Center. The following are the previously implemented initiatives, with their start-up times:

- Interest assessment on debts in excess of thirty days of age, with the aging beginning with the date of notification of the debtor (January 1983).
- Consumer credit bureau reporting (December 1984).
- Utilization of private collection agencies (January 1986).
- Tax refund offset for delinquent accounts (September 1986).

### **2. Future Initiatives**

In addition to the above items, two more initiatives are being prepared. Both are scheduled for implementation during the current year, thus completing implementation of the Debt Collection Act initiatives. These two remaining items are:

- Withholding of government employee's salaries to satisfy a debt.
- Assess penalties on delinquent payments, and administrative costs to cover establishment of the debt in the receivables file and initiation of the collection process.

## **C. STATUS OF DEBT COLLECTION INITIATIVES**

Through the simple process of matching the Finance Center initiatives against the requirements of the legislation, it can be seen that all of the Act's requirements have either been met or are nearing compliance. The fact that it took a full five years for the Finance Center to be in compliance with the Act could be discussed at length, with strong arguments on both sides. Fortunately, this topic is not germane to this thesis.

The concerns of this thesis deal with the impacts of collection, and, thus, the next topic to be reviewed is the impact on collection actions from the debt collection initiatives. The initial look will be with the current status of the out-of-service debt portfolio with respect to these initiatives, and then the status of collections via these initiatives will be reviewed.

## 1. Out-of-service Debt Portfolio Status

Appendix G lists the status of all the receivable accounts as of 30 September, 1986, categorized by the individual debt collection initiatives.

In reviewing Appendix G, it should first be noted that the totals do not agree with those of Appendix A. This is caused by the time difference in extracting the two data sets. The data in Appendix G was run by the Finance Center as of the close of fiscal year 1986 (September 30); the data presented in Appendix A is from a recent inquiry (February, 1987) run by the Finance Center at the request of the author. Although the difference is significant, it is inconsequential with respect to this thesis, since neither set of data was used in quantifying the costs or benefits.

Next, it is necessary to have some understanding of the categories used in Appendix G, therefore, short descriptions of the categories are provided:

- **Billings:** these are the accounts going through the initial collection attempts, from first notification to declaration as a non-response account. This category also includes those accounts which have active collections in progress.
- **Referral Pending:** these accounts represent those which are classified as non-response, and are undergoing review prior to being referred to one of the other collection avenues.
- **Collection Agency:** these accounts have already been referred to the collection agencies under contract.
- **Internal Revenue Service Refund Offsets:** these accounts have been identified to the IRS for the remittance of tax refunds. As required by the Debt Collection Act, the debtors are notified in advance to permit them to pay through the normal channels prior to IRS action.
- **Miscellaneous:** this category contains all the accounts for which collection action has been suspended, pending a further review (waiver requests, rebuttals, suspended, special handling), or collection action is delayed (address locators, other).

As can be seen from Appendix G, the additional collection avenues made available by the Debt Collection Act are, in fact, being utilized. The effectiveness of this utilization will be looked at next.

## 2. Collection Status

### *a. Credit Bureau Reporting*

Credit bureau reporting began in December of 1984. Five separate credit bureaus<sup>10</sup> are currently receiving delinquent account data, with 39,700 debtors reported

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<sup>10</sup>TRW, F-GAT Corporation, Associated Credit Services, Chilton Corporation and ACB Services

on representing \$ 47 million of debt.

As of the end of fiscal year 1986, this reporting led directly to the collection of \$ 262,000 from 802 debtors with another \$ 201,000 promised from 139 debtors.

*b. Collection Agency Referrals*

A General Services Administration contract with the Lockheed Datacom and Corliss Agencies has been utilized in the referral of 8,723 accounts totalling \$ 11.4 million. Since implementation on January 31, 1986, through the end of the fiscal year, a total of 59 accounts have been collected, representing \$ 15,230.56.

*c. 1986 Tax Refund Offset*

The Internal Revenue Service direct remittance to the Navy of debtors' tax refunds is to be accomplished for the first time with the 1986 tax returns (early 1987 payment). The account data for 22,070 debtors, representing \$ 18 million, has been referred to the IRS. The projected collections are approximately \$ 2.5 million.

*d. Federal Employee Salary Offsets*

Debtor accounts for 530 federal employees, representing \$ 258,000, have been identified. Of this total, 410 cases (\$ 207,000) are civilian employees, and the remainder are military. Collection actions are to commence this year, following the legislated due process requirements.

**D. REVIEW OF LEGISLATIVE IMPACTS AND COLLECTION EFFORTS**

From the data presented in this Chapter, it can be seen that Congress has provided additional avenues for federal agencies to utilize in debt collection efforts. Further, from the Navy's perspective regarding out-of-service debt, these scope increases have either been implemented or are nearing implementation. Thus, in this arena, at least, the Navy has fulfilled the legislative mandate.

The effectiveness of these additional collection procedures, however, is the real concern.

Individually, each of these additional procedures has produced a return, but it could be of greater value to note a few points about the data.

The best returns appear to be from the procedures which are entirely government controlled (tax refund offset and salary offset), or utilize passive participation from civilian organizations (credit bureau reporting). The one procedure using active participation of a civilian organization (collection agency referrals) has produced very low returns - and the figures presented represent gross returns, from which the agency's fees must be deducted.



Although not a part of this thesis, the return on investment represented by each of these separate procedures should be reviewed. Should it be determined that any of these procedures does not provide a positive return, legislative relief should be sought to ensure the Navy is not "throwing good money after bad".

Finally, since the data presented in this Chapter, although of some interest, has less meaning in a stand alone mode. Appendix H is provided to add perspective. This Appendix provides key data elements from each of the four branches of service for comparison purposes.

## **E. A QUICK COST-BENEFIT ANALYSIS**

Looking at the data presented in this thesis concerning the out-of-service debt, the costs of collection, and the amounts received, a few facts may be gleaned. Use of these facts will permit a rough analysis of the benefits derived from collection efforts.

The data elements of concern are:

- The Navy Finance Center expends \$ 862,082.81 on collection processes each year.
- Assuming a smooth rate of collections (known not to be the case, but accurate enough for a rough analysis), approximately \$ 2 million is collected from debtors annually.

From this data it can be seen that the Navy derives an annual benefit from the collection efforts of approximately \$ 1 million. This might be considered good, and well it should. The real question, however, is "Is it enough?".

From basic economics, it is known that an organization continues to improve its' position, while incurring additional costs, so long as the additional revenues generated equal or exceed those costs. The phrase normally thought of in this context is "Income is maximized where marginal costs equal marginal revenues".

In this context, the question "Is it enough?" becomes "Has the last amount invested in collection efforts produced collections of equal value?". Graphically, this can be represented in the manner shown in Figure 4.1.

As collection efforts are increased, the additional cost of each succeeding new effort will be more costly, since the least costly efforts should be implemented first. Thus the collection costs curve has a slope which continues to increase (the curve bends upward). Conversely, the recoupments are considered constant at some dollar level, with the increased efforts producing additional units of recouped debt.

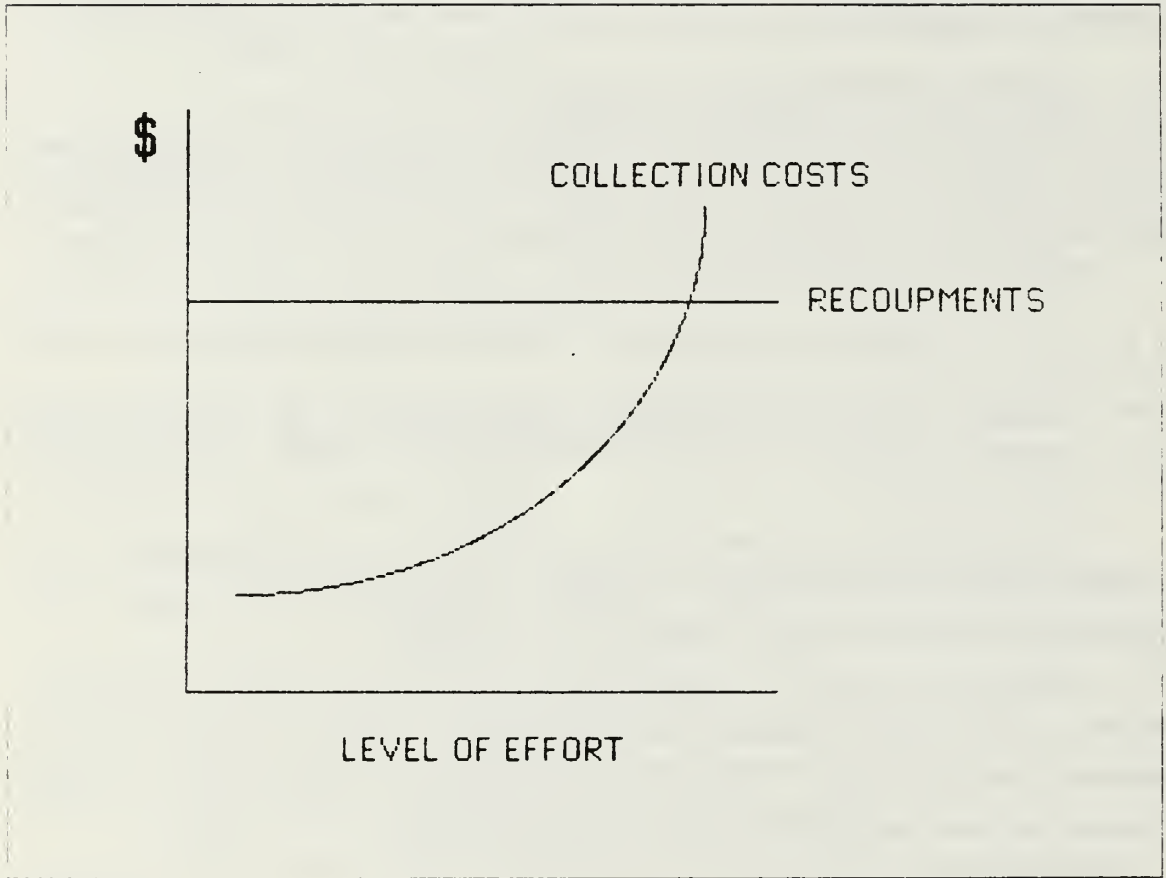


Figure 4.1 Marginal Analysis.

As can be seen in Figure 4.1, the intersection of these curves represents the optimal point of operations, that is, the point at which the Navy maximizes return from recouped debt.

## V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### A. SUMMARY

This thesis reviewed the reasons for overpayments at separation. Criteria were developed to isolate specific overpayment reason codes which would be examined more closely in the form of a cost-benefit analysis relative to the personnel policies driving the overpayments. From these criteria, one specific overpayment category was isolated--Reenlistment Bonuses.

The program and personnel policies surrounding reenlistments were then reviewed to determine the factors driving costs or providing benefits. Additionally, previous studies used to develop bonus payment amounts were reviewed. Using these data, the specific costs and benefits of the current Selected Reenlistment Bonus Program were developed. These cost and benefit elements were utilized for an enlistment period (assumed to be four years), separating the data into the annual components.

With the annual components, present values for the individual costs and benefits were computed. These separate elements were then combined to provide the net present value of the SRB Program to the Navy. Then recognizing a legal restriction impacting one of the elements, an alternate valuation model was provided to determine the impacts of this restriction.

Finally, within the cost-benefit analysis, a sensitivity analysis was performed to compute the probable range of values within which the true net present value lies. This was accomplished by varying the assumptions used in the analysis which were most likely to be different from the assumed value and which would significantly impact the result.

The final topics looked at were the Debt Collection Act of 1982, the Navy's implementation of the Act, and the Act's impacts on debt collection.

### B. CONCLUSION

Through examination of the net present value figures provided in Chapter III, it can be seen that the Navy derives positive value from the use of the Selected Reenlistment Bonus Program. When the values derived from the sensitivity analysis are reviewed, however, the results indicate that the net present value may, in fact, become negative (costs exceed benefits).

To determine the likelihood of this occurring, the use of models predicting both reenlistment rates and attrition rates would be required to be incorporated into the analysis.

The Program continues, however, to generate additional out-of-service debt, as do many other programs. This debt remains a significant and growing problem for the Navy Finance Center in particular, and the Navy as a whole.

The Navy is rapidly moving toward full implementation of the Debt Collection Act, and the provisions of the Act have provided additional avenues through which debts are collected. The government controlled collection methods provided by the Act appear to provide good levels of return, while those controlled by private enterprise provide much lower levels of return.

### **C. RECOMMENDATIONS FOR FURTHER STUDY**

The following is a list of topics related to this thesis for which additional study could provide benefit to the Navy.

- Review the processing and controls established for pay record review to determine any potential areas which could be used to capture overpayment information on specific members in the earliest possible time frame prior to separation. This would allow a higher percentage of collections prior to separation.
- Review the impacts on the expected number of reenlistments if the bonus payment schedule is changed to reduce the front loading effects of the current schedule. A reduction in this front loading will reduce the average level of out-of-service debt caused by these bonuses.
- Review the return on investment provided by the alternate collection methods provided by the Debt Collection Act of 1982. Should any provide a negative return, legislative relief should be sought to halt its' use.
- Review the percentage of times the recoupment of a reenlistment bonus results in an overpayment at separation, by recoupment reason category. Any categories found to be "excessive" should have a policy review conducted to determine potential collection methods and maximum time frames that could be utilized in the collection of the debt while the member is still in the service.
- Using prediction models for both reenlistment rates and attrition rates, focus the sensitivity analysis range into a narrower span to determine, with more precision, the net present value of the SRB Program.
- Review the costs of collection actions against the returns to determine if the marginal costs and marginal returns are approximately equal. Based upon the results of this study, expansion or contraction of collection efforts may be warranted.

#### D. POLICY RECOMMENDATION

Since the results of the SRB Program represent a net cost to the Navy, a review of the bonus payment schedule should be conducted. This review should focus on the reduction of the discounted costs of Program operation.

Since, as previously specified, one of the largest contributors to causing the net cost of the Program is the bonus payments, the payment schedule should be reviewed to determine the cost savings that can be derived from another payment schedule. Two options for different schedules are:

- Payment of equal installments on each of the anniversary dates and upon initial reenlistment. This would save, in discounted value \$ 12,969,484.60.
- Payment of the bonus amount with regular pay and allowances; that is, give the member half of a month's bonus on each regular payday. This option would save \$ 25,273,222.00.

Before implementation of any new payment schedule, however, a review of reenlistment rate impacts would be necessary to determine the costs of the change.

**APPENDIX A**  
**OVERPAYMENT REASON CODES**

- 01 A previously assigned, but no longer used code.
- 02 Travel - an overadvance or nonliquidation of a travel claim.
- 03 Allotment - overpayment of an allotment originally authorized by the member.
- 04 Lump Sum Leave - cash payment for leave not used prior to separation.
- 05 Reserve Pay
- 06 Retired Pay
- 07 Excess Leave - leave taken in excess of the amount earned which must be repaid at the rate of base pay.
- 08 Fines and Forfeitures - actions taken by a Court Martial or a Commanding Officer during Nonjudicial Punishment, which reduce a member's entitlement to pay or require payment by the member.
- 09 Miscellaneous (Civilian)
- 10 A previously assigned, but no longer used code.
- 11 Reenlistment Bonus - an entitlement for reenlisting to perform within a specialty area for a specific period. The overpayment is caused by failure of the member to serve the full period within the specialty, after payment has been received.
- 12 Advance Pay - a pay advance drawn upon receipt of permanent change of station orders. The overpayment arises when the member's separation occurs prior to repayment.
- 13 Dishonored Checks
- 14 Fraud, Keyport Wa.
- 15 Pay, Severance or Separation - an overpayment of pay entitlements under certain conditions of involuntary separation.
- 16 Pay, FSA-S - an overpayment of Family Separation Allowance, when the separation is caused by service on a ship.
- 17 Pay, Career Sea - overpayment of Career Sea Pay.
- 18 Pay, Rations-Sep - overpayment of the rations allowance paid in lieu of government provided meals.
- 19 Pay, VHA - overpayment of Variable Housing Allowance.
- 20 Pay, BAQ - overpayment of the Basic Allowance for Quarters.
- 21 Pay, Rate or Rank Change - overpayment of pay and allowances, which

are pay grade dependent, caused by payment based upon a higher grade than the member actually holds.

- 22 Pay, Nuclear Bonus - overpayment of bonus for service in the nuclear field, caused by removal of the nuclear specialty designator prior to fulfilling the requirements of service for the bonus.
- 23 Pay, Unconsidered Payment - overpayment caused by the computation of pay due without deducting an amount previously paid.
- 24 Pay, Multiple Entitlements
- 25 Pay, Miscellaneous
- 26 Pay, HPSP - overpayment of specialty pay for health professionals.
- 27 Successor Check, In House - overpayment caused by the issuance, by NFC, of a replacement check when the member cashs both the original and the replacement check.
- 28 Successor Check, Field - same as Overpayment Reason Code 27, except the replacement check is issued by a field disbursing activity.

**APPENDIX B**  
**DEBTS BY REASON, 1984 TO 1986**

Count	Item Total	% of	Balance of Debt	% of	Avg Debt Per Item	Reason Item
1	16	0.0325	\$ 21,549.45	0.0408	\$1,346.84	
2	623	1.2662	457,694.27	0.8671	734.66	
3	6,542	13.2962	4,293,134.03	8.1330	656.24	
4	4,860	9.8776	2,202,118.65	4.1718	453.11	
5	2,337	4.7498	968,950.44	1.8356	414.61	
6	390	0.7927	551,471.40	1.0447	1,414.03	
7	2,960	6.0160	1,882,365.56	3.5660	635.93	
8	5,655	11.4934	3,519,828.36	6.6680	622.43	
9	1,201	2.4410	975,715.73	1.8484	812.42	
10	3	0.0061	7,047.73	0.0134	2,349.24	
11	5,927	12.0463	22,145,183.74	41.9524	3,736.32	
12	3,948	8.0241	3,310,384.11	6.2713	838.50	
13	2	0.0041	1,065.50	0.0020	532.75	
14	7	0.0142	19,043.43	0.0361	2,720.49	
15	197	0.4004	408,886.94	0.7746	2,075.57	
16	15	0.0305	4,547.91	0.0086	303.19	
17	151	0.3069	78,325.74	0.1484	518.71	
18	251	0.5101	88,022.36	0.1668	350.69	
19	224	0.4553	191,826.20	0.3634	856.37	
20	793	1.6117	1,546,546.24	2.9298	1,950.25	
21	422	0.8577	249,670.56	0.4730	591.64	
22	37	0.0752	49,608.05	0.0940	1,340.76	
23	3,767	7.6562	2,195,718.84	4.1596	582.88	
24	4,310	8.7598	4,366,498.38	8.2720	1,013.11	
25	4,509	9.1643	3,182,678.63	6.0294	705.85	
26	55	0.1117	68,506.12	0.1298	1,245.57	
27-28	0		0			
Total	49,202	100.0	\$52,786,388.37	100.0	\$1,072.85	



APPENDIX C  
SUMMARY OF COST ELEMENTS

COST ELEMENT	4 YEAR P. V.
Computer Hardware	\$ 39,657.87
Computer Programming	9,667.80
Collection Efforts	279,861.94
Direct Compensation	905,058,872.70
Indirect Compensation	40,084,293.50
Bonus Compensation	277,353,282.94
Bonus Precert	143,729.05
Recruiting/Processing	14,186,219.17
Training	27,210,398.69
Compensation	14,694,631.84
TOTAL COSTS	\$ 1,279,060,615.50

APPENDIX D  
SUMMARY OF SAVINGS ELEMENTS

SAVINGS ELEMENT	4 YEAR P. V.
Recruiting/Processing	\$ 98,034,574.64
Training	187,925,734.70
Attrition	85,300,005.89
Productivity	956,622,938.90
TOTAL SAVINGS	\$ 1,327,883,254.13

APPENDIX E  
SUMMARY OF ALTERNATE COST ELEMENTS

COST ELEMENTS	4 YEAR P. V.
Computer Hardware	\$ 39,657.87
Computer Programming	9,667.80
Collection Efforts	279,861.94
Compensation Differential	364,865,057.96
Bonus Compensation	16,385,536.02
Bonus Precert	143,729.05
Recruiting/Processing	8,595,363.52
Training	16,476,738.05
Attrition Replacement Comp.	58,567,938.77
TOTAL COSTS	\$ 465,363,550.98

**APPENDIX F**  
**SUMMARY OF ALTERNATE SAVINGS ELEMENTS**

SAVINGS ELEMENT	4 YEAR P. V.
Recruiting/Processing	\$ 98,034,574.64
Training	187,925,734.70
Attrition	85,300,005.89
Productivity	576,873,501.51
<b>TOTAL SAVINGS</b>	<b>\$ 948,133,816.74</b>

APPENDIX G  
OUT OF SERVICE DEBT PORTFOLIO (30 SEP 86)

	NUMBER	AMOUNT ( MILLIONS )
1. Billings		
Payers	2,116	\$ 1.964
Initial	1,157	1.276
1st Delinquent	1,727	1.945
2nd Delinquent	1,191	1.533
3rd Delinquent	1,218	1.495
TOTAL	7,409	\$ 8.213
2. Referral Pending	5,122	\$ 10.908
3. Collection Agency		
Lockheed Datacom	6,532	\$ 9.293
Corliss	2,191	2.112
TOTAL	8,723	\$ 11.405
4. IRS Refund Offsets	22,070	\$ 17.750
60 Day Warning Letters		
5. Miscellaneous		
Waiver Requested	5,052	\$ 6.822
Address Locators	374	.473
Rebuttals	3,203	3.251
Suspended	66	.077
Special Handling	73	.182
Other	1,052	1.025
TOTAL	9,820	\$ 11.830

Total Active  
Receivables

53,148

\$ 60.106

**APPENDIX H  
INTER-SERVICE COMPARISONS**

	NAVY	ARMY	AIR Force	MARINE CORPS
Active Members	587,000	780,000	606,000	196,000
Number Debts	53,491	48,089	21,000	15,554
Amount of Debt	\$ 60 MIL	\$ 59 MIL	\$ 25 MIL	\$ 15 MIL
New Receivables	\$ 18 MIL	\$ 44 MIL	\$9.6 MIL	\$ 6 MIL
Write-off Rate	7.5%	12.5%	9.0%	
Credit Bureau	39,701	15,154	25,418	
Value	\$ 47 MIL	\$ 32 MIL	\$ 21 MIL	
Collection Agency	8,723	10,035	20,895	
Value	\$ 47 MIL	\$10.9MIL	\$16.9MIL	
IRS Offsets	22,000	26,000	27,000	5,000
Value	\$ 18 MIL	\$ 39 MIL	\$ 23 MIL	\$ 2.5 MIL
Collections	2,958,507	7,126,000	4,235,000	

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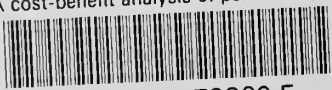
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