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U.S. MARINE CORPS ENLISTMENT BONUS PROGRAM

Catherine A. Palomba

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This study is an analysis of the United States Marine Corps Enlistment Bonus Program (EBP). The study's main objectives were to determine the effect of the EBP on enlistment supply and report measures of cost effectiveness, and determine the effect of the EBP on recruit quality, affirmative action, and early separation from the Marine Corps. (Cont'd)

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a. Determine the impact bonuses have on the decision to enlist.

b. Determine the contribution bonuses make to the recruitment/retention of non-high school graduates and high school graduates in MG I-IIIA.

c. Assess impact of bonuses vis-a-vis Marine Corps Affirmative Action objectives.

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U.S. MARINE CORPS ENLISTMENT BONUS PROGRAM

Catherine A. Palomba

Marine Corps Operations Analysis Group.

CENTER FOR NAVAL ANALYSES

2000 North Beauregard Street, Alexandria, Virginia 22311

ABSTRACT

This study is an analysis of the United States Marine Corps Enlistment Bonus Program (EBP). The study's main objectives were to determine the effect of the EBP on enlistment supply and report measures of cost effectiveness, and determine the effect of the EBP on recruit quality, affirmative action, and early separation from the Marine Corps.

Based on our analyses we believe the EBP should be continued. Also, we believe numerical quotas for the bonus program should be set high enough so that all funds allocated for bonuses are used.

EXECUTIVE SUMMARY

This study is an analysis of the United States Marine Corps Enlistment Bonus Program (EBP).

The study's main objectives were to:

- Determine the effect of the EBP on enlistment supply and report measures of cost effectiveness
- Determine the effect of the EBP on recruit quality, affirmative action, and early separation from the Marine Corps.

To meet the objectives we analyzed:

- Personnel information from United States Marine Corps (USMC) headquarters for recruits accessed between FY 1978 and FY 1980
- Survey data collected from USMC recruits in FY 1979 by the Rand Corporation for the Department of Defense
- Data on bonus payments from the USMC financial center.

The methodology we used included time series regression analysis, logit analysis, and cross-classification tables.

ENLISTMENT SUPPLY

The results with respect to enlistment supply indicate that:

- The $1,500 technical skills bonus (TB) resulted in 5 new recruits per 100 bonus enlistments
- The $2,500 combat arms bonus (CB) resulted in 10 new recruits per 100 bonus enlistments.

Applying these results to the EBP for FY 1982, we estimated the current program will generate approximately 456 new enlistments (the equivalent of 686 new 4-year contracts).*

* The number of equivalent new contracts is greater than the number of new men because an effect of the bonus is to lengthen the term of the contract.

COST

Our analysis shows that the cost of generating new recruits through the EBP is $12,840 per contract for the FY 1982 program. This is:

- Higher than through the use of additional recruiters or additional advertising
- Lower than through the use of a GI Bill.

DESCRIPTIVE RESULTS

- The mental aptitude and education levels of recruits in the EBP were substantially higher than those of recruits in comparable options.
- Neither TB nor CB were utilized to help smooth the time flow of accessions.
- There was little evidence that either TB or CB were given to the "most" qualified of those eligible in terms of either mental aptitude or education.
- TB appears to be serving affirmative action objectives with respect to blacks and females but NOT with respect to hispanics.
- Qualified blacks were less likely than qualified whites of being in CB and were more likely to have an open enlistment.
- About 8 percent of recruits in the EBP did not meet the formal qualifications for participation in the bonus program. It is unclear if this is a matter of recording error or lack of adherence to formal qualifications.
- Because 30 percent of the recruits qualified for TB enter without program guarantees, the USMC has a pool of qualified people to fill technical positions even without paying technical bonuses.
- Recruits in the EBP did not have higher separation rates than recruits in comparable nonmonetary guarantees.
- Evidence on survival in the USMC for those in the EBP with an average of 3 years from enlistment indicated that, all other things being equal:
  - Females had a significantly lower chance than males of survival in TB

- Blacks had a significantly lower chance than whites of survival in CB.

- A large proportion of funds allocated for TB and CB were not used because of:
  - Dropouts from the delayed entry program
  - Separations from the Marine Corps
  - Failure of TB recruits to receive eligible military occupational specialties (MOSs).

- The rate of unutilized funds was almost 40 percent for TB and about 25 percent for CB.

RECOMMENDATIONS

- The USMC should continue to use enlistment bonuses to generate new contracts because the bonuses can be targeted to particular quality groups and particular skills and because they lengthen the term of the contract.

- The USMC should give more nonmonetary program guarantees to recruits qualified for TB to increase the proportion of 4-year enlistments.

- The USMC should investigate the potential of using the bonus program to help smooth the time flow of accessions.

- The USMC should strictly follow the formal requirements for admission to the EBP.

- The USMC should set numerical quotas for the bonus program high enough so that all allocated funds will be utilized.

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CHAPTER 1

INTRODUCTION

This report is an analysis of the United States Marine Corps (USMC) Enlistment Bonus Program (EBP). In January 1981, the USMC asked the Center for Naval Analyses (CNA) to study various aspects of the bonus program [1]. The Marine Corps wanted to know the cost effectiveness of bonuses. They were also interested in various descriptive aspects of the program. In particular, they lacked information on the demographic characteristics and the separation rates of those enlisted in the program.

The EBP is designed to assist in attaining adequate numbers of volunteer enlistments in designated military occupational specialties (MOSs). It, therefore, has a twofold objective. First, increase high quality enlistments overall, and second, increase the flow of quality recruits into hard to fill MOSs. In addition, the EBP can be used to improve the balance of minorities in the different occupational fields. The success of the program must be judged against these objectives.

In this report, we present evidence with respect to the effect of the EBP on quality enlistments both overall and with respect to the bonus areas. We also present cost-effectiveness measures for the bonus. This enables us to compare enlistment bonuses with other means of generating increased enlistments. Finally, we look at the demographic characteristics of recruits receiving bonuses. This helps us determine the effect of the bonuses on the racial/ethnic distribution of the different occupational areas. We also examine the question of survival in the Marine Corps among program participants.

In this chapter we describe the bonus program as it existed when the study began. We also outline the study objectives and the analyses to be presented in the following chapters.

PROGRAM DESCRIPTION

The Enlistment Bonus Program (EBP) has two parts, the combat arms enlistment bonus (CB) and the technical skills enlistment bonus (TB). It requires an enlistment of at least 4 years. In contrast, about 35 percent of all USMC recruits sign 3 year enlistment contracts.

The EBP recruit is promised both training and a job in one of the several military occupational specialties (MOSs) eligible for the bonus at the time of enlistment. The bonus is paid when the training is successfully completed and a bonus-designated MOS is assigned.

The TB recruit must be a high school graduate and a U.S. citizen. The CB recruit must be a male and hold either a high school diploma or a General Educational Development (GED) certificate. In addition, both programs require minimum scores on various composites of the Armed Services Vocational Aptitude Battery (ASVAB). To get into the TB program requires an Armed Forces Qualification Test (AFQT) percentile score of 50, while to get into the CB requires only a 31.

The TB program also requires minimum General Technical (GT) and Electronics (EL) composite scores. A minimum GT score is required for CB (table 1).

TABLE 1

APTITUDE TEST SCORE REQUIREMENTS FOR THE ENLISTMENT BONUS PROGRAM

	Minimum score	
Aptitude test	TB	CB
ASVAB/AFQT	50	31
GT	110	90 (95 for GED)
EL	120	—

The EBP is open to accessions who have not previously served as well as to accessions who have previously served but have not been paid an enlistment bonus and are not currently eligible for a reenlistment bonus. (See [2] for additional details.)

The CB program began in June 1972 [3] with a bonus payment of $1,500. In September 1973 this was raised to $2,500, where it remained for most of the period (table 2). Since its beginning, CB has been attached to various MOSs in Occupational Fields 03 (Infantry), 08 (Artillery), and 18 (Tank and Amphibian Tractor).

Awarding bonuses for technical skills began in June 1974 with a bonus payment of $2,500. The latter sum was reduced to $1,500 in July 1975 and raised again to $3,000 in October 1980 (table 2). The technical skills bonus program originally covered 16 MOSs in Occupational Fields 28 (Data/Communications Maintenance) and 59 (Electronics Maintenance). This has been modified periodically so that as of November 1980 the TB program covered 56 MOSs in 7 Occupational Fields. The fields covered have varied as well as the MOSs.

The figures in table 3 on attainment (number of accessions into the EBP) and allocation (number of awards available) indicate the size of the program. The ratio of attainment to allocation, which is the

percentage sold, is also shown in table 3. The percentage sold of TB dropped after FY 1979 when unsold monthly quotas were no longer carried forward to following months.

TABLE 2

DOLLAR AMOUNT OF BONUS PAYMENTS

Fiscal year	TB	CB
1973	-	1,500
1974	-	2,500[a]
1975	2,500	2,500
1976	1,500	2,500[b]
1977	1,500	2,500
1978	1,500	2,500
1979	1,500	2,500
1980	1,500	2,500
1981	3,000	2,500

[a]Raised in September 1973.
[b]Recruits who signed contracts between February and May 1976 for shipment after June 1976 were entitled to $1,500 only.

TABLE 3

BONUS ATTAINMENT/ALLOCATION BY YEAR

	TB Program		CB Program	
Year	Attainment/ allocation	Percent sold	Attainment/ allocation	Percent sold
1978	1,000/1,000	100.0	2,340/2,340	100.0
1979	1,101/1,089	101.1	2,357/2,341	100.6
1980	1,125/1,298	86.6	2,339/2,342	99.8
1981	1,151/1,320	87.2	2,690/2,690	100.0

Because the quotas are small, only a fraction of qualified recruits are enlisted in the bonus program. Some of those not in the EBP enter other nonmonetary options or guarantees. As is the case for TB and CB, several of these nonmonetary options require 4-year enlistments. The remainder of the recruits enlist without guarantees. Recruits without program guarantees are referred to as "open" enlistments.

STUDY OBJECTIVES AND OUTLINE

The Marine Corps does not have information on the cost effectiveness of bonuses. This information is necessary when choosing among alternative methods of generating new enlistments. In this study a major goal is to determine the effect of the EBP on enlistment supply. First, the incremental cost of generating new enlistments using bonuses is calculated and compared to the incremental cost of generating new enlistments using other types of approaches.

Second, we assess the extent to which the bonus program increased accessions of high quality recruits. Recruits in the upper mental groups are desirable not only in technical skills but in combat arms as well. Third, we assess the effectiveness of the bonus program in meeting affirmative action objectives. The technical skills bonus can be used to increase enlistments among high quality racial/ethnic minorities and among women and to increase the proportion of minorities in high skill positions. The combat arms bonus can also generate increased enlistments among high quality racial/ethnic minorities.

In addition, we examine the extent to which bonuses go unused because recruits separate from the Marine Corps or fail to receive eligible MOSs. The number of recruits who enter the EBP but never receive a bonus is thought to be very high. For the bonus program to generate the maximum number of enlistments, quotas must accurately allow for program separations.

With these issues in mind, the study is organized around the following objectives:

- Determine the effect of the EBP on enlistment supply and report measures of cost effectiveness
- Determine the effect of the EBP on recruit quality, affirmative action, and early separtion from the Marine Corps.

Chapters 2 through 5 address the first objective. Chapter 2 reviews previous studies concerned with the effect of bonus programs on enlistment supply. Studies of both the Marine Corps and the Army are included. Chapter 3 reports our results analyzing data from a 1979 survey of Marine Corps recruits conducted by the Rand Corporation for the Department of Defense (DoD). Chapter 4 reports the results we obtained using regression analysis, while chapter 5 displays measures of cost effectiveness.

Chapters 6 through 9 present demographic information and information on separations. Chapter 6 describes all recruits accessed in FY 1980. This information contrasts those in the bonus program with those with similar nonmonetary options. The time pattern of shipment

quotas for several options is also examined. Chapter 7 is concerned with recruits who are qualified for the technical skills enlistment bonus. We determine those demographic characteristics that are related to enlistment in TB as opposed to other guarantee programs. The effect of enlistment in TB on separations is also examined. Chapter 8 develops similar information with respect to the combat arms bonus. While chapters 7 and 8 deal with all recruits "qualified" for the respective bonuses, chapter 5 deals only with those actually in the bonus program. Information for recruits enlisted in the program between fiscal years 1978 and 1980 is examined. In chapter 9 we also report results on separation experience based on information received from the Marine Corps Finance Center in Kansas City.

CHAPTER 2

REVIEW OF PREVIOUS STUDIES

INTRODUCTION

Since the inception of the All Volunteer Force (AVF) a number of incentives other than regular military pay have been used to increase enlistments. These have included monetary payments in the form of enlistment bonuses as well as nonmonetary options such as the choice of occupational field. A number of studies have attempted to determine if these incentives increase enlistment supply. The approaches of the studies have varied, but typically they include time series regression analysis or analysis of survey responses. The studies usually include cost-effectiveness measures of the incentive programs.

The surveys are of two types. Surveys of attitudes of civilian youth attempt to determine the effect of various incentives on propensity to enlist. Because only opinions rather than actions are involved, this approach can include options being considered as well as those already in use. An alternative approach is to survey recruits to determine what they would have done in the absence of a particular incentive. This approach concentrates more heavily on evaluating incentives that are already available and is the type of survey reviewed here.

The use of time series analysis to evaluate incentive programs is basically an extension of the determination of enlistment supply. Here, independent variables representing incentive programs are included in regression models that explain enlistments in the absence of these programs.

The remainder of this chapter presents summaries of the results of several previous studies of enlistment bonus programs organized around the type of analysis: survey, regression, and cost-effectiveness measures. Appendix A contains more specific details about the studies.

SURVEYS OF NEW RECRUITS

Several previous studies have used survey data collected from recruits to determine the effect of combat arms enlistment bonuses on manpower supply to the services. The recruits are asked what they would have done if they had not enlisted in the bonus program. Ideally, enlistment in the bonus program will be restricted to recruits who would NOT enlist otherwise. In that case, the gain in enlistments among the bonus recruits will be 100 percent, and a bonus that is available to 10 percent of recruits will increase enlistments by 10 percent. If, on the other hand, enlistment in the bonus program is given to recruits who would have enlisted anyway, bonus enlistment, although given to

10 percent of recruits, will not increase overall enlistments at all. The surveys attempt to determine what percentage of the recruits who are scheduled to receive the bonus would NOT have enlisted without it. This percentage gives us the increment in manpower among the recruits who enlisted in the bonus program. Multiplying this figure by the proportion of recruits scheduled to receive bonuses then tells us the increase in manpower to the service.*

The results of the surveys [4, 5, 6, 7], summarized in table 4, indicate that between 2 and 21 percent of those enlisted in the bonus program would NOT have enlisted without a bonus. This represents the increment in manpower among the recruits who enlisted in the bonus program. Alternatively, the results indicate that somewhere between 79 and 98 percent of those scheduled to receive bonuses would have enlisted anyway. These recruits do NOT increase manpower--they simply make manpower more expensive. Note that if we look only at studies when the bonus was $2,500 the increment in manpower ranges from 6 to 21 percent whereas the range for the $1,500 bonus is 2 to 17 percent.

Table 4 also indicates that the gain in manpower to the jobs for which bonuses are given is higher than the gain to the Army or Marine Corps. This is because some of those who would have enlisted anyway would have selected a different job if enlistment in the bonus program were not given. Previous studies indicate that the gain to the MOSs is somewhere between 20 and 49 percent. (All these studies are based on a $2,500 bonus.)

REGRESSION RESULTS

Several studies have included regression analysis using dummy variables to determine the effect of enlistment bonuses. The results are summarized in table 5.**

The single regression study of the Marine Corps indicates that neither the $1,500 nor the $2,500 combat arms bonuses affected enlistments. On the other hand, studies attribute somewhere between 0 and 6 percent effect on enlistments to the Army's $1,500 combat arms bonus and between 0 and 8 percent effect to the Army's $2,500 combat arms bonus. It was estimated that increasing the bonus from $1,500 to $2,500 generated additional enlistments of between 0 to 4 percent. Reference [8] concluded that increasing the bonus from $1,500 to $2,500 had little effect on enlistments while [4] indicated that the $2,500 bonus may have had twice the effect on enlistments that the $1,500 bonus had.

* Note that, as explained in chapter 1, the bonus recruit must earn a qualifying MOS before the bonus is actually paid.
** With the exception of [4], the results apply to high school graduates in mental groups I to III. Reference [4] includes non-high school graduates as well.

TABLE 4

SUMMARY OF PREVIOUS SURVEY RESULTS FOR THE COMBAT ARMS BONUS

Study Reference	Bonus	Increase in enlistments among recruits enlisted in the bonus program: To service (percent)	To job (percent)
[4][a]	$1,500 Army	17	
[5][a]	1,500 Marine Corps	2	
[6][b]	1,500 Army	14	
	1,500 Marine Corps	5	
	2,500 Army	17	47
	2,500 Marine Corps	21	49
[7][b]	2,500 Army	8	40
	2,500 Marine Corps	6	20

[a]Data are for all recruits in mental groups I-III.
[b]Data are for high school graduates in mental groups I-III.

The proportion of Army recruits scheduled to receive bonuses was approximately 15 percent throughout the period of the studies. With 15 percent of Army recruits scheduled to receive bonuses, a 5 percent effect on enlistments implies that about one-third of the bonuses are given to recruits who would not have enlisted otherwise. In fact, the increase in enlistments among bonus program recruits in the Army falls in the range of 0 to 37 percent for the $1,500 bonus and 0 to 42 percent for the $2,500 bonus. Comparing these figures to those in table 4, we see that the regression results for the Army imply upper estimates that are much larger than the survey results.

The specific details of the regression studies [4, 6, 8] are reported in appendix A. It should be noted here, however, that all the studies include data from the draft era, are generally for short periods of time, and often exclude presumably important variables.

COST-EFFECTIVENESS

Several of the studies included one or more measures of cost effectiveness (table 6). The reported cost per additional manyear varied between $1,834 and $1,982 for the $1,500 combat arms bonus for the

Marine Corps and between $970 and $1,054 for the $1,500 combat arms bonus for the Army. The difference in cost between the services reflects that a higher proportion of Marines reported a willingness to enlist without the $1,500 bonus.

TABLE 5

SUMMARY OF PREVIOUS REGRESSION RESULTS FOR THE COMBAT ARMS BONUS

Study Reference	Bonus	Increase in enlistments among bonus program recruits (percent)	Increase in enlistments to the service (percent)
[4]	$1,500 Army	0 to 37	0 to 6
[6]	1,500 Army	0 to 16	0 to 4
	2,500 Army	0 to 42	0 to 8
	1,500 Marine Corps	0	0
	2,500 Marine Corps	0	0
[8]	1,500 Army	35	5
	2,500 Army	31	5

Both [6] and [8] report that it costs substantially more for the Army to generate additional man-years using the $2,500 bonus than using the $1,500 bonus. In contrast, [6] indicates that the cost of generating additional man-years is lower for the Marine Corps using the $2,500 bonus than the $1,500 bonus.

About the same approach is used in each of the studies to measure cost effectiveness. The incremental increase in cost represented by the bonus is divided by the incremental gain in man-years. Incremental man-years result both from new men attracted to the service by the bonus and from those who lengthen their contract from 3 to 4 years to receive the bonus. Only in [8] are results adjusted to reflect that not all bonus recruits will finish the fourth year. None of the studies reflect that the contract lengthening effect of the bonus generates additional manpower in the fourth year, which is presumably fully trained and more productive than manpower in the previous years. (See appendix A for more details.)

TABLE 6

SUMMARY OF PREVIOUS COST-EFFECTIVENESS RESULTS FOR THE COMBAT ARMS BONUS

Study Reference	Bonus	Cost per additional man-year
[5]	$1,500 Marine Corps	$1,834
[6]	1,500 Army	1,054
	2,500 Army	1,642
	1,500 Marine Corps	1,982
	2,500 Marine Corps	1,667
[8]	1,500 Army	970
	2,500 Army	1,941

SUMMARY

Previous survey studies of Army and Marine Corps enlistment bonus programs indicate that 2 to 17 percent of those who enlisted for the $1,500 combat arms bonus would not have enlisted otherwise. The figures for the $2,500 combat arms bonus are 6 to 21 percent.

Comparable figures from regression analysis on incremental enlistments from bonus recruits give a range of 0 to 37 percent for the Army's $1,500 combat arms bonus and 0 to 42 percent for the Army's $2,500 combat arms bonus. The one regression study of the Marine Corps found no effect from either bonus. The range of results for the Army bonuses is wide and the upper limit of results implies an effect on enlistments that is much higher than the surveys suggest.

The various estimates indicate that the cost per additional manyear with the $1,500 bonus was lower for the Army than the Marine Corps. This reflects that more Marines would have enlisted without the $1,500 bonus. Because the Marine Corps had a greater response to the bonus increment, the cost per additional man-year of the $2,500 bonus was much closer for the two services.

CHAPTER 3

CNA ANALYSIS OF 1979 DOD SURVEYS

Under the sponsorship of the Office of the Assistant Secretary of Defense, the Rand Corporation (Rand) conducted the 1979 DoD Survey of Personnel Entering Military Service. The DoD data were made available to CNA for analysis. The survey was administered to Marine Corps enlistees at the Armed Forces Examination and Entrance Stations (AFEES) immediately after the enlistees were sworn in. In all, four different forms of the survey were given. Because they elicit responses suggesting increases in manpower, Form 1, administered in March-April 1979, and Form 3, administered in September-October 1979, are most relevant [9, 10]. The first part of this chapter calculates figures on incremental manpower among bonus recruits using answers to the 1979 survey. The answers to some of the attitudinal questions on the DoD survey are assessed later in the chapter.

INCREMENTAL MANPOWER

Both Forms 1 and 3 asked the respondent the following questions (identification phrases are in parentheses):

- "Did you sign up for a job which pays a cash enlistment bonus when you complete your job training?" (BONUS)
- "How much is your bonus?" (AMOUNT)
- "Suppose the job you signed up for did not pay a cash bonus. What would you have done?" (ALTERNATIVES)

In addition, Form 1 asked:

- "If you could choose the length of your first enlistment how many years of active duty would you sign up for?" (DESIRED LENGTH)

Of the 937 Marine Corps enlistees who completed Form 1, 133 answered yes to the BONUS question. Another 369 answered no, 34 did not answer, and 401 answered, "I don't know." Table 7 shows the percentage distribution of these responses. It also shows the number and percentages for Form 3. The large number of "I don't know" answers may reflect the way the question was worded. The question did not ask if the respondent would receive a cash bonus; it asked whether his job was one for which bonuses were paid. Most probably the "I don't know" group does not include those who enlisted for either the technical skills or combat arms bonus programs. The bonus enlistee must sign a statement regarding his payment and should be aware of the program for which he is enlisting. Note also that the BONUS question does not enable one to

determine whether the "yes" respondents are in the technical skills or the combat arms program.

TABLE 7

RESPONSES OF MARINE CORPS RECRUITS
TO BONUS QUESTION

	Form 1		Form 3	
Response	Number	Percent	Number	Percent
Yes	133	14.2	107	11.9
No	369	39.4	383	42.6
I don't know	401	42.8	350	39.0
No answer	34	3.6	58	6.5
	937	100.0	898	100.0

Table 8 indicates the amount those who responded yes to the BONUS question said they would receive. Because the bonus amounts for the EBP were $1,500 and $2,500 in 1979, several respondents answered this question incorrectly. Note that overall the proportion answering $2,500 is about double that answering $1,500, which is expected based on allocations (table 2).

TABLE 8

RESPONSES OF MARINE CORPS BONUS RECRUITS
TO AMOUNT QUESTION

	Form 1		Form 3	
Response	Number	Percent	Number	Percent
$ 500	12	9.0	10	9.3
1,000	4	3.0	3	2.8
1,500	38	28.6	23	21.6
2,000	9	6.8	3	2.8
2,500	59	44.3	62	57.9
3,000	3	2.3	0	0.0
No answer	8	6.0	6	5.6
	133	100.0	107	100.0

On Form 1, 65.4 percent of those who answered the BONUS question yes indicated that even if their job did not pay a cash bonus they would have signed up for it. An additional 21.1 percent indicated they would have signed up for a different job in the same service. Corresponding percentages for Form 3 were 72.0 percent and 20.6 percent. Thus, more of those answering Form 3 would have chosen the same service and the same job. Note that on each form about 4 percent of the respondents said they would join a different service. Table 9 indicates the answers to the ALTERNATIVES question.

TABLE 9

RESPONSES OF MARINE CORPS BONUS RECRUITS TO ALTERNATIVES QUESTION

Alternative to bonus enlistment	Form 1		Form 3	
	Number	Percent	Number	Percent
Same service, same job	87	65.4	77	72.0
Same service, different job	28	21.1	22	20.6
Different service	5	3.7	4	3.7
Not enlisted	9	6.8	3	2.8
No answer	4	3.0	1	0.9
	133	100.0	107	100.0

Only Form 1 asked the enlistees about desired length of enlistment. Table 10 shows the desired length of enlistment for those who would have enlisted in the Marine Corps even without a bonus. The results suggest that the bonus may lengthen the term of enlistment for 50 percent or more of those who would have enlisted anyway. In fact, because many of the nonmonetary guarantee programs require 4-year enlistments only 35 percent of all enlistees do sign up for less than 4 years.

The responses to these questions allow us to estimate the increment in enlistments among bonus recruits attributable to the bonus program. That is, we wish to determine the proportion of bonus enlistees who were drawn into the Marine Corps to get the bonus and who would not have enlisted without the bonus. Averaging the results for those answering the ALTERNATIVES question on either Form 1 or Form 3, 70 percent of the respondents would have chosen the same service and the same job while an additional 21 percent would have chosen the same service but a different job. The residual, 9 percent, is the gain in manpower to the Marine Corps among bonus recruits. The gain to the MOSs in the bonus areas is

30 percent.* (The 9 percent figure may be compared to the 2 to 21 percent range indicated in table 4 while the 30 percent figure may be compared to the 20 to 49 percent range for increments to the job.)

TABLE 10

RESPONSES OF SELECTED MARINE CORPS RECRUITS TO DESIRED LENGTH QUESTION

	Those who would have joined Marine Corps without bonus	
First choice of length	Same job	Different job
Less than 4 years	46 (55%)	15 (58%)
4 years or more	37	11
	83	26

It was noted that the DoD survey did not identify the program code for the recruits. Therefore, it was not possible to distinguish between those enlisted for a technical skills bonus and those enlisted for a combat arms bonus. Two approaches were used to try to distinguish between these groups.** In one approach, as a proxy for program code, the survey results were divided between those indicating their bonus would be $1,500 and those indicating their bonus would be $2,500. The results, reported in appendix B, indicate that the increments in manpower to the service and to the job are 5 percent and 28 percent, respectively, for the $1,500 bonus recruits. They are 10 percent and 28 percent, respectively, for the $2,500 bonus recruits.

ATTITUDE RESPONSES

The 1979 DoD survey includes a number of questions about attitude such as why the respondent enlisted. Several of these variables were cross-classified with the BONUS question to see if the bonus program attracts recruits whose attitudes differ from the typical recruit. Responses are from Form 1 only and exclude those who did NOT answer the BONUS question.

* Analysis of black bonus recruits answering the survey indicated a gain in blacks of 13 percent to the Marine Corps and 41 percent to the bonus areas.

** The DoD survey results were matched to records from Marine Headquarters, and the recruits program code was identified. Because many of the recruits answering the DoD survey either did not record their Social Security Number or recorded it incorrectly, this approach did not give satisfactory results.

The respondents were presented a series of reasons why people join the military and were asked if the reason was "true for me" or "not true for me" (table 11). A smaller fraction of BONUS enlistees answered "true for me" to the statement "I enlisted to get trained in a skill that will help me get a civilian job when I get out." The percentages were 75.9 percent for the BONUS group and 86.4 percent for the total. While this result appears surprising, it may reflect the dominance of the BONUS group by combat arms enlistees (table B-2).

TABLE 11

REASONS FOR JOINING THE MARINE CORPS[a]

	BONUS group			
Reasons for joining	Yes	No	I don't know	Total
To get trained in a skill that will help me get a civilian job	75.9	84.8	91.3	86.4
Because I was unemployed and couldn't get a job	13.5	13.3	17.0	15.0
Because I can earn more money than as a civilian	27.1	21.1	30.4	26.1

[a]Table shows percentage answering "true for me."

A larger fraction of BONUS enlistees answered very satisfied when asked "How satisfied are you with the military job you signed up for?" The percentage was 63.2 percent for BONUS enlistees. It was 50.5 percent overall, and only 47.2 percent for the "no" bonus group. In addition, a higher percentage of BONUS enlistees stated that the first recruiter they talked to was from the Marine Corps (68.4 percent versus 63.6 percent overall).

The BONUS recipients viewed their economic alternatives more positively than did the group as a whole. A higher proportion of BONUS enlistees answered that it would be "not difficult at all" or "somewhat difficult" to get a full time job in the area where they now live if they were not entering the military (78.2 percent opposed to 73.2 percent overall.)

In addition, economic incentives may be more important to the BONUS group. A larger proportion of BONUS enlistees reported they currently had savings (71.8 percent versus 51.1 percent overall). Finally, a

larger fraction of BONUS enlistees reported their parent's income as $20,800 or above. The figures were 33 percent for the BONUS enlistees and 25 percent overall (table 12).

TABLE 12

PERCENTAGE DISTRIBUTION OF PARENT'S INCOME

	BONUS group			
Income	Yes	No	I don't know	Total
Don't know or missing	32.0	28.0	40.9	34.0
Less than $10,400	22.0	23.0	22.0	22.0
$10,400 to $20,799	13.0	23.0	16.0	18.0
$20,800 or more	33.0	26.0	22.0	25.0
	100.0	100.0	100.0	100.0

SUMMARY

In this chapter the answers to the 1979 DoD survey of new recruits were used to calculate figures on the incremental manpower among bonus enlistees. The gain in manpower to the Marine Corps among bonus enlistees is estimated as 9 percent while the gain to the MOSs in the bonus areas is estimated as 30 percent.

In addition to enlistment supply calculations, several questions about attitude were examined to see if there were differences between those who enlisted with the bonus as an incentive and those who did not. A smaller fraction of the bonus group agreed with the statement, "I enlisted to get trained in a skill that will help me get a civilian job when I get out." A higher proportion of the bonus group expressed satisfaction with the military job for which they signed up. The group enlisting in the bonus program reported better job alternatives. They also reported more savings and higher family income. In fact, approximately one-third of the bonus group reported that their family income was $20,800 or above.

CHAPTER 4

ESTIMATES OF ENLISTMENT SUPPLY EFFECTS BASED ON REGRESSION ANALYSIS

In addition to survey analysis, we used regression analysis to help determine the effect of enlistment bonuses on enlistment supply. In this chapter we report on results with this approach.

If we treat bonuses as an increment to pay, then regression estimates of pay elasticities can be used to measure the effect of changes in bonus levels on enlistment supply.

Alternatively, we can measure the effect of the bonus program through the use of an independent variable separate from pay. For example, the bonus program can be represented by a dummy variable in a time series regression.

In this chapter we present our results using these two approaches. First, we present estimates based on the "pay elasticity approach." The presentation of our results using the "bonus variable approach" follows. The latter contains a brief discussion of the problems contained in many of the regression studies of enlistment supply.

THE "PAY ELASTICITY" APPROACH

Table 13 shows the estimated effect of the TB and CB bonuses on enlistments in FY 1979. We chose this year for illustrative purposes because the DoD survey data discussed in chapter 3 was also collected in 1979. The most recent estimates of pay elasticity for the USMC are in the range of 0.5 to 0.7 [11, 12]. Thus, table 13 shows the percentage increase in enlistments attributable to the bonuses for pay elasticity values of both 1 and 0.5. Note that even with a pay elasticity of 1 the effect of the bonuses on the various enlistment groups was probably quite small (i.e., about 1 percent or less).*

Our basic approach required that we find the increment to pay which, if received over 4 years, would have the same discounted present value as the discounted present value of the bonus. We used a 10-percent discount rate and estimated that the combat arms bonus would be received after 6 months while the technical skills bonus would be received after 1 year.** This pay increment was then included with the FY 1979 military and civilian pay figures to determine the effect of the bonuses on the military-to-civilian pay ratio. When this pay increment

* The calculations used to obtain these estimates are explained in appendix C.
** This estimate is based on information from the USMC Finance Center.

was multiplied by the pay elasticity we obtained our estimates of the enlistment supply effects shown in table 13.

TABLE 13

ENLISTMENT SUPPLY EFFECTS BASED ON
PAY ELASTICITY CALCULATIONS, FY 1979

Bonus	Enlistment group	Percent increase in enlistments	
		Pay elasticity=1	Pay elasticity=.5
$1,500 TB	High school graduate		
	Mental groups I-IIIA	.34	.17
	Mental groups I-II	.69	.35
	Qualified for TB	1.24	.62
$2,500 CB	High school graduate		
	Mental groups I-IIIA	.84	.42
	Mental groups I-II	.84	.42
	Qualified for CB	.96	.48

Our estimates of the percentage increase in enlistment supply differ for the various enlistment groups. This reflects the different probabilities these groups have of receiving the bonus. In effect, these probability figures indicate the proportion of a particular group to which the pay increase represented by the bonus applies. The probability of enlisting in the technical skills bonus program is approximately 5 percent for HSG mental groups I to IIIA enlistees, 10 percent for HSG mental groups I and II enlistees, and 18 percent for those qualified for the technical skills bonus. The probability of enlisting with a combat arms bonus is 7 percent for both HSG mental groups I to IIIA enlistees and HSG mental groups I and II enlistees. It is 8 percent for those qualified for the combat arms bonus.*

We can also determine the number of new enlistments per 100 bonuses given. These figures are shown in table 14. Our estimate is 3 to 7 new recruits for TB and 6 to 12 new recruits for CB. The number of new recruits per 100 bonuses given depends on the amount of the pay increase, the pay elasticity and the number of bonuses available.

* These figures are based on the proportions of each group who enlisted for the bonus in FY 1980.

TABLE 14

NUMBER OF "NEW" ENLISTMENTS
PER 100 BONUS RECRUITS[a]

Bonus	Pay elasticity=1	Pay elasticity=.5
$1,500 TB	7	3
$2,500 CB	12	6

[a]Calculations are illustrated in appendix C.

THE "BONUS VARIABLE" APPROACH

Here we report our results using the "bonus variable" approach. In this approach a model to determine enlistment supply is developed. The bonus program is then represented in the model as an independent variable or variables separate from pay.

For this study we used a previously developed model. The model, developed by Cralley [13] estimates enlistment supply for the United States Marine Corps. Reference [13] includes monthly observations from July 1973 through September 1979.

We entered the bonus program into the Cralley model in two ways. First, the program was represented with dummy variables. Second, we treated the number of technical skills bonus enlistments in each month as a continuous independent variable. Cralley's model and our results using it will be discussed below.

Background

The ability of a model to determine a bonus effect depends on how accurate the model is as a whole. Many studies of enlistment supply have suffered from a number of problems. Reference [14] reviews several of these problems including the:

- Assumption that enlistments are directly proportional to youth population
- Use of monthly shipments rather than contracts written as a measure of enlistments
- Use of AFEES test scores that suffer from norming and compromise problems
- Presence of high correlations between the independent variables

- Lack of variation in recruiter strength or youth population.

Cross-sectional models show considerable variation in recruiter strength and youth population. But the two variables are highly correlated for observations at the state level.

Cralley's response to the latter problem [14] was to do a cross-sectional analysis to obtain estimates of the effects of recruiters and youth population on Marine Corps enlistments. To avoid the problem of high correlations among the independent variables, data for 1978 were obtained at the recruiting substation level. In addition, Cralley used contract rather than shipment data and he used scores from tests administered at recruit depots after enlistment to avoid the problem of test compromise. The elasticities for recruiters and youth population estimated in the cross-section study were then used in a time series analysis. The objective of the time series analysis was to estimate the effects of changes in the youth unemployment rate and the expiration of the GI Bill on the number of Marine Corps enlistments. Cralley found high school graduate contracts to be significantly related to both these variables. Because there was little variation in the military-to-civilian pay ratio during the period, Cralley did not estimate the effect of this variable in his time series model. Instead, he considered a range of pay elasticities.

The Model

In addition to recruiters (EFFREC), population (YPOP), and military-to-civilian pay (MCPR), Cralley's model includes unemployment (U), a dummy for December 1976 (DEC 76), the month prior to expiration of the GI Bill, a dummy for January 1976 and following months which represents the absence of the GI Bill, and 11 seasonal dummies.

Cralley's model has the following form:

$$\ln\left(ENL/(EFFREC^{a}\ YPOP^{b}\ MCPR^{c})\right) = A0 + A1\ (\ln U) + A2\ (DEC\ 76) + A3\ (GI\ Bill) + B1\ (JAN) + \ldots + B11\ (NOV) + \text{error term}$$

The parameters a, b, and c are fixed inputs to the model, while the parameters A0, A1, ..., B11 are estimated in the analysis. ENL represents various enlistment categories.

The number of enlistments can be determined by solving:

$$ENL = \exp(A0)\ EFFREC^{a}\ YPOP^{b}\ MCPR^{c}\ U^{A1}$$

$$\exp[A2\ (DEC\ 76)]\ \exp[A3\ (GI\ Bill)]\ldots$$

$$\exp[B1\ (JAN)]\ \exp[B2\ (FEB)]\ldots\exp[B11\ (NOV)]\ {}^{\circ}N,$$

where "exp" represents the exponential function and N is exp (error term).

The estimated elasticities for high school graduates in mental groups I and II were .36 for recruiters and .60 for population. The pay elasticities Cralley used were 0.0, 0.5, 1.0, and 1.5. Cralley's results for high school graduates in mental groups I and II are shown in table 15.

TABLE 15

SELECTED COEFFICIENTS FROM CRALLEY'S MODEL[a]

	Estimated coefficients			
Variable	Pay elasticity= 0.0	Pay elasticity= 0.5	Pay elasticity= 1.0	Pay elasticity= 1.5
GI Bill	-.25	-.22	-.20	-.18
Unemployment	.81	.79	.78	.77
DEC 76	.84	.85	.85	.85

[a]Results are for new contracts who are high school graduates in mental groups I and II.

Bonus Dummies

To determine the effect of the EBF program we introduced a number of variations into Cralley's model. Here we present the results obtained using dummy variables. We focused on the technical skills bonus and on high school graduate mental groups I and II enlistments.* The technical skills bonus was introduced in June 1974 with an award of $2,500. This level was reduced to $1,500 in July 1975, and raised to

* The level of bonus payment for combat arms was fixed throughout the period of observations which makes a dummy variable approach inappropriate.

$3,000 in October 1980. Because Cralley's data extends to September 1979 only the first two bonus levels were examined. We added two dummy variables to the model. The first variable, BONUS 1, takes on the value of 0 for months before June 1974 and the value of 1 for June 1974 to June 1975. The second variable, BONUS 2, takes on the value of 0 for months before July 1975 and the value of 1 for July 1975 and after.

Because of the somewhat high correlation between BONUS 2 and the GI Bill (.60), we decided to run the model with all relevant variables included rather than use a stepwise procedure. With multicollinearity in a model, tests of significance become suspect, but the estimates of coefficients are unbiased. The column headed Model 1 in table 16 reports our results using the bonus dummy variables and a pay elasticity of 1.* Cralley's results are reported for comparison. Neither bonus variable is significant. The estimated coefficient for the introduction of the bonus is .11 and for the reduced bonus level is -.06. In total the bonus program is estimated to have a negative effect on enlistments after June 1975.

TABLE 16

REGRESSION RESULTS FOR HIGH SCHOOL GRADUATES IN MENTAL GROUPS I-II

	Estimated coefficients			
		This analysis (pay elasticity=1)		
Variable	Cralley	Model 1	Model 2	Model 3
Unemployment	.78[a]	.87[a]	.63[a]	.74[a]
GI Bill	-.20	-.12[b]	-.35[a]	-.30[a]
DEC 76	.85[a]	.79[a]	.65[a]	.62[a]
BONUS 1		.11	.16[b]	
BONUS 2		-.06	.19[b]	
MISS			-.33[a]	-.29[a]
TB COUNT				.023

[a]Significant at the 5 percent level.
[b]Significant at the 10 percent level.

* Although the coefficients are not shown in table 16, the model also included 11 seasonal dummies.

It appeared that the BONUS 2 variable was picking up the negative effects of some other event that occurred during the mid-1970s. Therefore, a dummy variable, MISS, which has the value of 1 for the period January 1976 through August 1976 when the ASVAB was misnormed for the upper mental groups, for tests administered at the AFEES but not for those administered at recruit depots, was included in the model [15].* The coefficients using this model, MODEL 2, are reported in table 16. This model attributes a greater positive effect to the reduced bonus payment than to the original bonus payment. In addition, the coefficients on both BONUS variables are implausibly high. Because only about 10 percent of high school graduates in mental groups I and II enlist for technical skill bonuses these results imply that all of the bonuses are given to recruits who would NOT have enlisted otherwise and some additional enlistments (6 to 9 percent) are generated as well. Appendix D reports the means, standard deviations, and correlations of variables in the study.

TB COUNT

The Cralley model was also run with the number of technical skills bonus contracts signed in each month, TB COUNT, as an independent variable. This variable was entered in logarithmic form. The coefficient of TB COUNT indicates the percent increase in enlistments of high school graduates in mental groups I and II, the dependent variable, for a 1 percent increase in the number of TB contracts signed (i.e., the elasticity). This coefficient would be zero if all the TB recruits would have enlisted without the bonus program. The column of table 16 headed Model 3 reports the coefficients for this model.

We are primarily interested in how many "new" recruits will be generated as we increase the number of TB contracts signed. The log linear model implies that the ability to attract "new" recruits will fall as the quota for TB increases. However, the results allow us to estimate that starting from a level of 1,000 TB contracts and 10,000 high school graduate mental groups I and II contracts signed, an increase of 100 TB contracts will result in 23 new recruits.**

A similar model using an independent variable to represent the number of combat arms contracts signed in each month, CB COUNT, was also

* This would lead to a low proportion of upper mental group recruits on tests administered at recruit depots.

** $\Delta \text{ ENL} = (e)(\text{ENL}) \dfrac{\Delta \text{ TBCOUNT}}{\text{TB COUNT}}$; where e = elasticity, and Δ ENL and Δ BONUS indicate the change in enlistments and bonus recipients, respectively. Substituting indicated values leads to

$$\Delta \text{ ENL} = (.023)(10{,}000)\left(\frac{100}{1{,}000}\right) = 23.$$

run but the results could not be used because they were much too high (see appendix E).

SUMMARY

Pay elasticity calculations indicate that the $1,500 technical skills bonus probably resulted in 3 to 7 new qualified recruits per 100 bonuses given while the $2,500 combat arms bonus probably resulted in 6 to 12 new qualified recruits. These results are quite similar to those based on results from the survey analysis.

The bonus variable approach produces results that are much higher. The results for the technical skills bonus using dummy variables imply that the bonus program generated more enlistments than available bonuses. The results using the independent variable TB COUNT indicate that 100 technical skills bonuses would produce 23 new high school graduate recruits in mental groups I and II. The results using the independent variable CB COUNT were implausibly high.

CHAPTER 5

COST-EFFECTIVENESS RESULTS

In this chapter we review our previous results regarding enlistment supply and calculate cost-effectiveness figures for the Marine Corps enlistment bonus program. We used three different approaches to determine the number of new men entering the Marine Corps per 100 bonuses given (see table 17). Survey responses and pay elasticity calculations indicate that the $1,500 technical skills bonus resulted in between 3 and 7 new qualified recruits per 100 TBs while the $2,500 combat arms bonus resulted in between 6 and 12 new qualified recruits per 100 CBs. The regression model gives a higher figure for the effect of the technical skills bonus on enlistments, indicating 23 new qualified recruits per 100 bonuses given. The regression estimate of the effect of the combat arms bonus on enlistments did not give usable results. In addition to new men enlisting in the Marine Corps, we estimate that 30 of 100 bonus recruits were "new" to the bonus areas. That is they would have either chosen different jobs or not joined the Marine Corps without the bonus.

TABLE 17

SUMMARY OF RESULTS WITH RESPECT TO ENLISTMENT SUPPLY

	Number of new qualified recruits per 100 bonus enlistments	
	TB	CB
Survey results	5	10
Pay elasticity calculations	3-7	6-12
Regression	23	Not Usable

The $2,500 CB appears to generate more new enlistments per 100 bonuses given than does the $1,500 TB. This certainly reflects the higher monetary payment associated with CB but could also reflect other aspects of the program. (For example, CB is paid earlier in the enlistment than is TB and to a larger percentage of those enlisted.)

In this chapter we report cost-effectiveness figures for a $3,000 enlistment bonus (see table 18).* The figures estimate the cost of generating the equivalent of a new 4-year contract from a qualified recruit. Because there is uncertainty concerning the number of new men per 100 that a $3,000 bonus would generate, cost-effectiveness figures are shown for bonuses that generate 5, 10, and 20 new men (see appendix F).

TABLE 18

COST-EFFECTIVENESS FIGURES FOR $3,000 BONUS

Bonus	Cost per equivalent of additional 4-year enlistment if 100 bonuses result in		
	5 new men	10 new men	20 new men
$3,000 TB	$22,162	$14,674	$8,894
$3,000 CB	$11,186	$8,958	$6,493

The calculations reflect that in addition to "new" men, the bonuses generate additional manpower from recruits who extend their contracts from 3 years to 4 years in order to get into the bonus program.** The probability of signing a 3-year contract depends on the type of job the recruit would have selected in the absence of the bonus. Approximately 40 percent of those with technical jobs and over 50 percent of those with combat related jobs sign 3-year contracts as do approximately 30 percent of those with other jobs. We used these percentages in estimating the proportion of bonus recruits who extended their contract from 3 to 4 years.

Separate figures are shown in table 18 for the TB and CB bonuses. This is because the two bonuses differ in the probability that the recruit will extend his contract by 1 year. They also differ in the

* Th[illegible] ,000 amount is more representative of the current program because 65 percent of the quota for bonuses in FY 1982 call for payments of $3,000 or more.

** To be complete the cost-effectiveness analysis should accurately measure the useful service life of those in the bonus program compared with ot[illegible] recruits. These calculations would reflect differential separa[illegible] rates and reenlistment rates. Our data set did not extend far enough to estimate these rates. However, we do present evidence that the separation rates for those in TB and CB are lower than for open enlistments and not unlike those in comparable options (see chapters 7 and 8).

length of training recruits typically receive. In addition, we estimated that at least 10 percent of the TB recruits remain in the Service but serve in MOSs that do not qualify them for bonus payment (thus lowering the cost involved for TB).

With respect to the bonus MOSs, we estimated that the cost per additional equivalent 4-year contract was $7,338 for technical skills and $5,192 for combat arms. In each case we estimated that 30 of 100 bonus enlistees were new to the bonus area while the remaining 70 would have taken the same job. We included an estimate of the number of recruits who extended their contracts from 3 to 4 years. (See appendix F for additional details.)

Finally, we calculated the cost per contract for the FY 1982 bonus program. The details are discussed in appendix F. We estimated that the current program will generate 456 "new" enlistments. Allowing for the contract lengthening effect, we estimate the program will generate the equivalent of 686 new 4-year contracts at a cost per contract of $12,840.

To put the figures in table 18 into some perspective we note that the cost per additional high school graduate in mental groups I to IIIA generated from hiring one additional recruiter is estimated at between $4,000 to $7,000 depending on the elasticity of enlistments with respect to recruiters. Goldberg's estimate of the USMC recruiter elasticity [12] is higher than Cralley's [14], which produces the lower cost figure. Goldberg's studies of advertising for the Navy estimate the cost of an additional HSG in mental groups I to IIIA as $2,300 for radio and TV advertising and $1,100 for other advertising. No similar studies of the costs and effects of advertising have been done for the Marine Corps. Finally, we estimated that the cost of a new HSG enlistment in mental groups I to IIIA is between $44,500 and $90,000 for a GI Bill that pays $16,000 in educational benefits to a high school graduate. A 50 percent use rate was assumed. The lower cost figure assumes the pay elasticity is 1, the higher figure assumes it is .5 (see appendix G). The real cost of the GI Bill has been estimated at closer to $200,000 [16] when allowance is made for the fact that recruits must separate from the service to use their benefits. On the other hand, if 4-year contracts are required the cost of the GI Bill would be lower than any of these figures suggest (table 19).

SUMMARY

Cost-effectiveness figures were calculated assuming alternatively that a $3,000 bonus would generate 5, 10, and 20 new men. The calculations are complicated by the fact that many of those who would have enlisted without the bonus enlist for 4 years rather than 3 years to receive the bonus. In addition, we had to allow for the fact that the extra man-years generated in this manner are "trained" man-years.

The cost-effectiveness figures vary between approximately $8,000 to $22,000 for TB and between $6,000 to $11,000 for CB depending on the number of new men. Compared to other alternatives, enlistment bonuses are probably less expensive than the GI Bill but more expensive than recruiters or advertising.

TABLE 19

COST-EFFECTIVENESS COMPARISONS

Method	Enlistment group	Cost per recruit
New recruiter	HSG mental group I-IIIA	4,000 to 7,000
Advertising	HSG mental group I-IIIA	1,100 to 2,300
GI Bill	HSG mental group I-IIIA	200,000
TB	qualified for TB	8,000-22,000
CB	qualified for CB	6,000-11,000

CHAPTER 6

COMPARISON OF BONUS RECRUITS TO RECRUITS WITH OTHER GUARANTEES

The technical skills and combat arms bonuses are only two of several guarantee programs for which recruits can enlist. In this chapter we present an overview of all of the guarantee programs. We highlight comparisons of those in TB and CB to those in selected other programs. CB is compared to the nonbonus combat option (Z6) and to the infantry option (G1). TB is compared to avionics (A5) and electronics (G5). In addition to asking whether the bonuses raise the quality of recruits we also ask whether the bonuses affect the timing of shipment for recruits. The Marine Corps has had a shortage of school seats following peak shipments during the summer months. The bonus has the potential to smooth the flow of shipments.

This chapter is organized in two sections. In the first section we present demographic comparisons (also see appendix H). In the second section we present information on shipment quotas. Our information is for recruits accessed during FY 1980.

DEMOGRAPHIC COMPARISONS

Table 20 provides a list of the guarantee programs or options. It includes their program code, name, and qualifications.* Several different program codes have been used for the bonus program in addition to those shown. Recruits can also enlist for 6-year bonus options. The 6-year options are linked to particular occupational fields rather than to a group of occupational fields.

Table 21 shows the frequency and percent of recruits in each of the guarantee programs. The table contains a category, open, for recruits without guarantees, and a category, other, for recruits with location options, band options, or 6-year nonbonus options.

The greatest percent (52.8) of recruits had open enlistments. The other programs individually accounted for between 0.4 percent and 5.5 percent of enlistments. The two bonus options, combat arms (CB) and technical skills (TB), accessed 5.0 percent and 2.4 percent, respectively. In contrast, the nonbonus combat option (Z6) only accounted for 1.6 percent of recruits, and electronics (G5) accounted for .9 percent of enlistments.

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* During the period of this study, the minimum eligibility scores for high school graduates were 10 points below those stated in table 20 for all programs except the EBP.

TABLE 20

GROUND AND AVIATION ENLISTMENT OPTIONS PROGRAMS
QUALIFICATIONS REFERENCE CHART

Programs		Title	OF[a]	ASVAB	Minimum required aptitude scores	Required vision	Sex	Enlistment Term	Other prerequisites
Ground Enlistment Options	Z1	COMBAT SUPPORT	08/13/18	31	GT- 100	NCP(F)[b] 20/200 corrected to 20/25	M	3/4	NONE
	Z2	ADMINISTRATIVE	01/02/25/ 40/44	31	GT- 100 and CL- 100		M/F	3/4	NONE
	Z3	LOGISTICS, SUPPLY, TRANSPORTATION, REPAIR SERVICES DISBURSING, AND MARINE CORPS EXCHANGE	04/30/31 32/34/41	31	GT- 100 and CL- 100		M/F	3/4	NONE
	Z4	MECHANICAL/ELECTRICAL	11/13/21/ 23/25/32/ 35	31	GT- 90 and EL- 100 or CM- 100 or MM- 100	NCP(F)	M/F	4	NSC[c]
	Z6	COMBAT	03/08/18	31	GT- 90	20/200 corrected to 20/25	M	3/4	NONE
	G1	INFANTRY	03	31	GT- 90	20/200 corrected to 20/25	M	3/4	Age 18 USC[d]
	G2	PERSONNEL ADMINISTRATION	01	31	GT- 100 and CL- 100		M/F	3/4	NONE
	G3	MOTOR TRANSPORT (Opr only)	35	31	GT- 90 and MM- 90 HEARING-must be 15/20 (1) ear w/o a hearing aid	NCP(F) 20/30 One eye; 20/50 SNL other eye, w/o glasses.	M/F	4	NSC CDL[e]
	G4	RADIO COMMUNICATIONS	25/26	31	GT- 100 EL- 100		M/F	3/4	NCR(MTV)[f] USC

TABLE 20 (Cont'd)

Programs		Title	OF[a]	ASVAB	Minimum required aptitude scores	Required vision	Sex	Enlistment Term	Other prerequisites
	G3	ELECTRONICS	28	31	GT- 100 EL- 120	NCP(F)	M/F	4	NCR(MTV) USC
	G6	FOOD SERVICES	33	31	GT 90		M/F	3/4	NONE
	G7	COMPUTER OPERATIONS	40	31	GT- 110 EDPT- 60		M/F	4	HSG
	G8	MILITARY POLICY/ CORRECTIONS SPECIALIST	58	31	GT- 100		M/F	4	HSG Age- 19 Ht- 68" (M) Ht- 64" (F) NCR(MTV) USC CDL
Aviation Enlistment Options	A5	AVIONICS	66	31	GT- 110 EL- 120	NCP(F)	M/F	4	USC
	A6	AVIATION ORDNANCE	65	31	GT- 110 EL- 120	NCP(F)	M/F	4	NCR(MTV) USC
	A7	AVIATION SUPPORT, ADMIN AND ANTI-AIR-WARFARE	30/60/61/ 70/72	31	GT- 100 and CL- 100 or GM- 100	NCP(F)	M/F	4	NONE
	A8	TECHNICAL SUPPORT	28/59/60/ 66/68/73	31	GT- 110 and EL- 120	NCP(F)	M/F	4	USC
	A9	AIRCRAFT MAINTENANCE	60/61	31	GT- 100 GM- 100	NCP(F)	M/F	4	NONE
BONUSES	Z5	COMBAT ARMS ENL BONUS	03/08/18	31	HSG- GT- 90 GED- GT- 95		M	4	NCR(MTV) or (MMTO)[b]

TABLE 20 (Cont'd)

Programs	Title	OF[a]	ASVAB	Minimum required aptitude scores	Required vision	Sex	Enlistment Term	Other prerequisites
GB	TECHNICAL SKILLS ENLISTMENT BONUS	28/59/66/21/ 60/63/64/73	30	GT- 110 EL- 120	20/20 with NCP	M/F	4	HSG NCR(2-MTV)

Sources: MCO 1130.53G
MCO 1130.57B

NOTE: "Enlistment prerequisites, except for minor traffic violations, and the prerequisites associated with each option; may not be waived. Applicants who have been retested on a production test, may not enlist under the provisions of either reference." [Revised (July 1977 — destroy previous chart)]

[a]OF = Occupational Field
[b]NCP = Normal Color Perception
[c]HSG = High School Graduate
[d]USC = United States Citizen
[e]CDL = Current Drivers License
[f]NCR(MTV) = No Civil Record (Minor Traffic Violations)
[g]MNTO = Minor Non-Traffic Offenses

TABLE 21

CHARACTERISTICS OF RECRUITS BY PROGRAM GUARANTEE, FY 1980

Program	Number in program	Percent in program	Percent ≥ 4-year enlistment	Percent high school graduate	Percent black	Percent female[a]	Percent separated from USMC[b]
Avionics	1,116	2.8	100.0	92.7	8.7	5.2	7.7
Air ordnance	176	0.4	100.0	77.3	6.3	-	14.8
Air support	1,182	2.9	100.0	77.3	25.2	10.0	10.7
Air technical support	822	2.0	100.0	88.7	6.2	10.3	9.5
Aircraft maintenance	2,118	5.2	100.0	80.5	14.0	1.9	10.4
CB	2,009	5.0	100.0	90.0	12.2	-	12.7
TB	960	2.4	100.0	97.6	5.1	6.4	9.3
Combat support	951	2.3	43.1	66.2	8.6	-	12.9
Administration	969	2.4	48.1	89.2	36.0	29.7	17.9
Logistics	1,075	2.7	47.5	78.1	33.3	17.2	17.1
Mechanical/electrical	2,239	5.5	100.0	94.3	23.2	1.6	11.3
Nonbonus combat	584	1.4	44.0	39.1	10.4	-	20.2
Infantry	1,048	2.6	42.6	76.4	5.7	-	14.8
Personnel	478	1.2	40.2	85.8	37.4	27.6	17.2
Motor transport	849	2.1	100.0	94.1	17.9	2.5	11.5
Radio communications	879	2.2	52.0	77.6	25.7	13.3	15.6
Electronics	371	0.9	100.0	94.4	12.7	6.5	10.0
Food	473	1.2	38.9	66.2	30.7	4.4	21.4
Computer	165	0.4	100.0	98.8	9.7	22.4	7.9
Military police	355	0.9	100.0	98.9	7.9	6.5	14.6
Open	21,402	52.8	50.8	64.3	28.3	4.5	19.3
Other	326	0.8	80.7	96.0	5.5	13.2	9.8
All	40,547	100.0	65.0	73.8	23.1	5.6	16.2

[a]Dashes indicate programs open to males only.
[b]Did not complete an average of 1 year of service.

In contrast to CB, for which all enlistments are for at least 4 years, only about 40 percent of those in the nonbonus combat option or the infantry option signed 4-year contracts. Thus, there was a substantial difference in committed manpower between these programs.

In addition, only about 40 percent of recruits in the nonbonus combat option were high school graduates. The figure for the infantry option, 76.4 percent, was higher but still quite a bit below the 90 percent figure for CB. In addition, the percent black was higher in CB than in either of these comparable options, and the separation rate was lower.

Table 22 shows the mental group distribution of high school graduate (HSG) recruits in selected guarantees. CB had more HSG recruits in mental group I than did the other two comparable options. The proportion of those in mental groups I and II was about the same in CB and in infantry but it was much lower in the nonbonus combat option. In fact, almost 50 percent of the latter recruits were in mental group IIIB.

TABLE 22

MENTAL GROUP DISTRIBUTION FOR SELECTED GUARANTEE PROGRAMS FOR HIGH SCHOOL GRADUATE RECRUITS, FY 1980

Program	Mental group category						
	I	IIA	IIB	IIIA	IIIB	IV	Total
Combat							
CB	5.9	5.9	21.2	33.6	33.2	0.2	100.0
Nonbonus combat	4.4	4.4	14.0	28.1	49.1	0.0	100.0
Infantry	4.3	10.0	22.3	31.4	31.7	0.3	100.0
Technical							
TB	21.9	25.9	41.9	9.5	0.9	0.0	100.0
Avionics	9.0	15.2	39.4	32.1	4.3	0.0	100.0
Electronics	6.6	8.0	39.1	34.9	11.4	0.0	100.0
Open	2.6	3.8	13.7	25.3	44.0	10.6	100.0
All	3.7	5.7	18.5	29.8	37.4	4.9	100.0

It appears then that the quality of recruits based on proportion that are high school graduates was higher in CB than in either the nonbonus combat option or the infantry option. The quality of recruits based on the mental group distribution of high school graduates was higher in CB than in the nonbonus combat option but roughly similar for CB and infantry.

We compared TB to the avionics (A5) and electronics (G5) options. While the contrasts are not as striking as for CB, there are some differences. Both options require 4-year enlistments as does TB. And more than 90 percent in all three of these programs were high school graduates. The percent black was lower in TB than in avionics or electronics, but the percent female was higher in TB than in avionics.

The most striking differences between those in TB and those in avionics and electronics were in the distributions of mental groups. Only about 10 percent of TB recruits were in mental group IIIA or IIIB. This is quite a bit lower than those in avionics (36 percent) and those in electronics (46 percent).

While CB and TB both compare favorably in terms of quality to the selected programs we examined, we must be cautious about what we infer from this. If, in fact, the recruits in CB and TB were all "new" recruits then we could conclude the bonus program, in contrast to similar guarantee programs, raised the quality of recruits. However, it is possible that the bonus merely moved recruits out of the comparable programs (or other programs) into TB and CB, and in doing so lowered the quality of these other programs. The fact that the nonbonus combat option only filled about 19 percent of its quota in FY 1980 lends support to the latter view. The infantry program met 67 percent of its quota. On the other hand, both avionics and electronics met almost their full quotas while TB did not.

SHIPMENT QUOTAS

In this section, we examine shipment quotas to see if the bonus program has helped smooth the flow of shipments. Table 23 shows the shipment quotas for various programs in FY 1980. There was little difference in shipment quotas between TB and the comparable programs, avionics and electronics. In fact, all three programs had a greater share of their enlistment quotas in the summer months than did the share of all guarantees. Thus, any potential of TB relative to the comparable programs to induce enlistments in the low enlistment months was not being utilized. It should be noted, however, that TB did not fill its quota from November through May. (Only 71 percent of the quota was filled.) Thus, the potential of TB to smooth the flow of enlistments is uncertain.

The share of CB's enlistment quota that was in the summer months was substantially higher than was the share of all guarantees. This was not true of the comparable programs, nonbonus combat and infantry. The latter two programs had quotas that were constant throughout the year. Thus, the combat bonus was not used to help smooth the flow of accessions. Note that while the percentage sold of CB was almost 100 percent the percentages sold of nonbonus combat and infantry were quite low.

TABLE 23

SHIPMENT QUOTAS FOR SELECTED PROGRAMS

	Oct to Jan (percent)	Feb to May (percent)	June to Sept (percent)	Total (percent)	Percentage of quota sold
All guarantees	30.4	29.2	40.4	100.0	83.2
TB	29.8	25.8	44.4	100.0	86.6
Avionics	29.9	24.9	45.2	100.0	99.8
Electronics	30.0	28.0	42.0	100.0	99.5
CB	17.8	15.9	66.3	100.0	99.8
Nonbonus combat	33.3	33.3	33.3	99.9[a]	18.7
Infantry	33.3	33.3	33.3	99.9[a]	67.0

[a]Does not add to 100 percent due to rounding.

These data suggest somewhat more unused potential for CB than TB to help smooth the flow of enlistments. We know TB did not fill the nonsummer quota while CB did. (This may reflect the difference in monetary payment between TB and CB that existed in FY 1980.)

SUMMARY

Comparing the distribution of percent high school graduate and mental groups we see the quality of recruits in CB was higher than recruits in the comparable programs, nonbonus combat and infantry. The distribution of mental groups of recruits in TB was higher than recruits in the comparable programs, avionics or electronics. It is unclear however, whether TB and CB merely moved recruits out of comparable programs or whether they raised the overall quality of recruits.

With respect to shipment quotas in FY 1980, neither TB nor CB were used to help smooth the flow of accessions. Because the percentage sold of TB was low in the nonsummer months it is unclear whether TB actually had unutilized potential. The quota for CB was essentially filled throughout the year. Raising the quota of CB in nonsummer months and lowering it in summer months might not adversely affect the percentage sold and might help smooth the flow of accessions.

CHAPTER 7

PROGRAM ALLOCATION AND SURVIVAL AMONG RECRUITS QUALIFIED FOR THE TECHNICAL SKILLS BONUS

The qualifications for the technical skills bonus program (TB) are the highest of any of the guarantee programs. While several of the aviation programs have similar composite score requirements, they do not require high school graduation. Thus, recruits qualified for the technical skills bonus should be the highest quality of all recruits.

In this chapter we address two questions with respect to the recruits qualified for TB:

- What were the characteristics of recruits who enlisted in the technical skills bonus program and how do these compare to the characteristics of recruits in other guarantee programs?

- Were enlistees in the technical skills bonus program more (less) likely to separate from the USMC than other equally qualified recruits?

The first question is concerned with program allocation. Because quotas are limited, only some fraction of those qualified for TB can actually enlist in the program. We want to determine whether the probability of enlistment in TB is higher among the highest quality of those eligible. We also want to determine whether affirmative action objectives are served by the technical skills bonus program. Clearly the bonus can be used to direct highly qualified racial/ethnic minorities and women into the most technical areas. We examine information obtained from recruits who enlisted in FY 1980.

The second question is concerned with the likelihood of early separation from the Marine Corps. Informal information indicates that separation from the Marine Corps is high among recruits enlisted for the technical skills bonus program. Of particular concern is whether separation is unusually high after bonus payment is made. For this reason, longer term separation rates are of interest. We examine separation rates for recruits who enlisted in FY 1978.

PROGRAM ALLOCATION AMONG RECRUITS QUALIFIED FOR THE TECHNICAL SKILLS BONUS PROGRAM, FY 1980

In this section we examine all recruits qualified to enter the technical skills bonus program in FY 1980 ("TB qualified" recruits) and attempt to distinguish between the characteristics of those who enlisted for the technical skills bonus and those who did not. Complete records were available for 4,495 "TB qualified" recruits. These recruits were

at least high school graduates with the following aptitude test scores: AFQT=50, EL=120 and GT=110.

Our examination of the "TB qualified" recruits begins by comparing their program distribution to that of all recruits in FY 1980. Then, after grouping the program guarantees into several categories, information comparing the demographic characteristics of recruits in these categories is presented. In addition to the descriptive tables, we also present the results of a logit model. This is a regression technique that allows us to simultaneously control for the influence of several independent variables on the dependent variable. The dependent variable is the program for which the recruit enlisted.

A Comparison of the Program Distribution for "TB Qualified" Recruits and For All Recruits, FY 1980

Table 24 shows the percentage distribution of all recruits and of "TB qualified" recruits for the several options available in FY 1980. There are marked differences between the two groups. The percentage of open enlistments was 52.8 for all recruits and 29.9 for the "TB qualified" recruits. While lower than for the overall distribution, the 29.9 percent figure indicates that the Marine Corps is able to recruit a number of highly qualified people without giving them any kind of monetary or nonmonetary guarantee. Note that while only 2.4 percent of all recruits were in the technical skills bonus program, 18.5 percent of "TB qualified" recruits were in this program. The next largest program for these recruits was avionics, followed by CB. In fact, combining TB and CB, just over 25 percent of "TB qualified" recruits were scheduled to receive bonuses.

Characteristics of "TB Qualified" Recruits by Program Category

Because several of the programs accessed a small number of recruits, we divided the possible options into 10 categories. In addition to categories for the technical skills bonus (TB), the combat arms bonus (CB), and open enlistments (OPEN), we divided the aviation options between those that were predominately technical (AVIATION/TECH) and those that provided support (AVIATION/SUPPORT). A group of mechanical and electrical options was symbolized MECH/ELEC. A combat comparison group (CB COMPARISON) was made up of options that overlapped with the fields included in the combat arms bonus. The remaining programs were divided into three groups, ground subprograms (GROUND SUB), ground field programs (GROUND FIELD) and a residual category, OTHER.* (See table I-1 of appendix I for a listing of the specific options in each group.)

* The latter category included location options, 6-year nonbonus options and band options.

TABLE 24

PROGRAM ALLOCATIONS FOR "TB QUALIFIED" RECRUITS[a] AND FOR ALL RECRUITS, FY 1980

Program	"TB qualified recruits" (frequency)	"TB qualified recruits" (percent)	All recruits (percent)
Avionics	385	8.6	2.8
Air ordnance	37	.8	0.4
Air support	57	1.3	2.9
Air technical support	243	5.4	2.0
Aircraft maintenance	198	4.4	5.2
CB	324	7.2	5.0
TB	832	18.5	2.4
Combat support	68	1.5	2.3
Administration	81	1.8	2.4
Logistics	70	1.6	2.7
Mechanical/ Electrical	147	3.3	5.5
Nonbonus combat	27	0.6	1.4
Infantry	156	3.5	2.6
Personnel	29	0.6	1.2
Motor transport	53	1.2	2.1
Radio communications	57	1.3	2.2
Electronics	93	2.0	0.9
Food	22	0.5	1.2
Computer	108	2.4	0.4
Military police	54	1.2	0.8
Open	1,343	29.9	52.8
Other	111	2.4	0.8
All	4,495	100.0	100.0

[a]Qualifications: ESG
AFQT = 50
EL = 120
GT = 110

In this section of the chapter, we compare recruits in the various program groupings according to: length of enlistment, time in the delayed entry program, sex, marital status, race, education, and mental group.

The demographic information in table 25* indicates that the recruits in TB were above average in the proportion female, the proportion black and the proportion married.

The proportion of each program group's enlistments that were for 4 years or more is shown in table 25. Several of the program groups were made up entirely of guarantees that require 4-year enlistments. This was true for AVIATION/SUPPORT, AVIATION/TECH, TB, and CB. Several of the other program groups contain one or more individual guarantees that require 4-year enlistments.

Because "TB qualified" recruits are the highest quality of all recruits, a high proportion of 4-year enlistments is desirable. In FY 1980 this proportion was 82 percent. Among the OPEN enlistments the proportion of 4-year enlistments was 62 percent. The below average proportion of 4-year enlistments for those with open enlistments must be balanced against the flexibility gained when a recruit is accessed without a guarantee.

The proportion of recruits in each program group with delay time more than 6 months is also shown in table 25. This variable gives us some idea of the willingness of recruits to wait for a particular type of guarantee. Overall, the percent with delay time more than 6 months was 25.4 percent while for OPEN enlistments it was only 11.3 percent.

The aviation programs and the MECH/ELEC group had the highest percentage of recruits with delay time more than 6 months--around 40 percent. In contrast, both TB and CB had a below average percent with delay time more than 6 months--around 20 percent.

Table 26 contains information on the mental group distribution of recruits in selected programs (also see appendix I). The data indicate that TB contained an above average proportion of those who were in mental group I and a below average proportion of those in mental group IIIA.** With respect to education, TB had a lower than average proportion of recruits

* Table I-2 of appendix I presents similar information for "TB qualified recruits" cross-classified with all 22 programs.
** Because of the high test score requirements only 7 percent of those qualified for TB were in mental group IIIA.

TABLE 25

CHARACTERISTICS OF "TB QUALIFIED" RECRUITS
BY PROGRAM GROUPS, FY 1980

Program	Frequency	Percent	Percent ≥4-year enlistment	Percent with delay time > 6 months	Percent black	Percent female	Percent married[a]
AVIATION/SUPPORT	255	5.7	100.0	44.7	2.0	1.2	3.5
AVIATION/TECH	665	14.8	100.0	40.1	3.0	4.8	3.5
CB	324	7.2	100.0	20.5	1.5	0.0	2.5
CB COMPARISON	251	5.6	39.4	20.0	0.8	0.0	2.4
GROUND FIELD	158	3.5	81.0	38.0	1.3	3.2	3.8
GROUND SUB	151	3.4	56.3	37.1	4.6	13.2	5.3
MECH/ELEC	405	9.0	93.8	40.2	2.7	7.7	4.2
OPEN	1,343	29.9	62.3	11.3	3.9	3.8	6.3
OTHER	111	2.4	80.2	15.6	0.9	15.3	2.7
TB	832	18.5	100.0	23.3	4.2	6.2	5.2
All	4,495	100.0	82.0	25.4	3.1	4.7	4.6

[a]Includes all those not single.

with a college certificate or degree or with some type of post high school training.*

TABLE 26

MENTAL GROUP DISTRIBUTION FOR SELECTED PROGRAM GROUPS
"TB QUALIFIED" RECRUITS, FY 1980

	Mental Group Category				
Program	I	IIA	IIB	IIIA	Total
AVIATION/TECH	22.0	29.7	41.5	6.8	100.0
TB	24.3	28.2	41.7	5.8	100.0
OPEN	23.7	27.9	41.0	7.4	100.0
All	22.7	28.4	41.9	7.0	100.0

Overall, the demographic information on these recruits indicates that those in TB were above average in the proportion who were:

- Female
- Black
- Married
- A high school diploma graduate or certificate holder
- In mental group I.

Those in TB were below average in the proportion who were:

- In the delayed entry program for more than six months
- College graduates or with other post high school experience
- In mental group IIIA.

* The latter contains those with education code 5, about 90 percent of whom have 13 or more years of education.

Logit Results for Program Allocation

In this section we use logit analysis,* a regression technique, to examine the simultaneous relationship between several background characteristics and the recruit's choice of enlistment program. (See appendix J.)

We divided the dependent variable, enlistment program, into four categories.** These were technical skills bonus, (TB), the technical aviation programs, (AVIATION/TECH), open enlistments, (OPEN), and all the remaining options, (ALL OTHER). There were 4,495 observations.

We used the logit model to determine which characteristics were related to enlistment in these program categories.

Independent variables were created to represent four mental group categories, (MG I), (MG IIA), (MG IIB), and (MG IIIA). The variables took on the value 1 if the recruit was in the particular mental group category and 0 otherwise.

The age of the recruit, (AGE), and the delayed entry time in days, (DELAYED ENTRY TIME), were both entered as continuous variables. Race/Ethnic was represented by two independent variables. Hispanics and others were combined into a single group, HISPANIC. The other independent variable representing race was BLACK. Those with certificates of attendance who completed 12 years of school but were not diploma graduates were included in the category CERTIFICATE. POST HIGH SCHOOL included those with occupational certificates and/or education beyond the 12th grade for which no other code is applicable. The final education variable was COLLEGE, representing those with college certificates or degrees. The remaining variables were FEMALE, which took on the value 1 if the recruit was a female, and MARRIED, which took on the value 1 if the recruit was not single (e.g., was married, divorced).

Table 27 shows the marginal effects of the independent variables on the probability of being in each of the four program categories. The variables whose logit coefficients are significantly different from zero are indicated.

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* Because a recruit is either in a particular program or not, the dependent variable for this study, enlistment program, is a qualitative variable rather than a continuous variable. With a qualitative dependent variable, ordinary least squares regression is not an appropriate technique.

** The dependent variable in the multinomial logit model can be made up of several different categories. However, the computational cost of additional categories is quite high.

TABLE 27

MARGINAL RESULTS FOR PROGRAM ENLISTMENT
"TB QUALIFIED" RECRUITS, FY 1980[a]

Characteristics	TB	AVIATION	ALL OTHER	OPEN
Mental Category				
IIA	-.016	-.002	.010	.008
IIB	-.021	-.016	.015	.022
IIIA	-.059[b]	-.022	.028	.053[c]
AGE	-.019[b]	-.001	-.000	.020[b]
DELAYED ENTRY TIME	-.000	.001[b]	.001[b]	-.001[b]
RACE/ETHNIC				
BLACK	.077[b]	.019	-.142[b]	.046
HISPANIC	-.072[c]	-.037	.077[c]	.032
FEMALE	.063[b]	.011	.002	-.075[b]
MARRIED	.070[b]	-.005	-.066[c]	.001
EDUCATION				
COLLEGE	-.080	-.004	.147[b]	-.063
CERTIFICATE	.029	-.135[b]	-.050	.156[b]
POST HIGH SCHOOL	-.005	-.044[c]	.067[b]	-.018
Percent In Category	18.5	14.8	36.9	29.9

[a]Base case: single, white, male high school diploma graduate, mental group I.
[b]Significant at the 5 percent level.
[c]Significant at the 10 percent level.

The coefficients in the column headed TB indicate how the presence of the given characteristic altered the probability of being in the technical skills bonus program compared to the base case. The base case was a white, single, male, high school diploma graduate in mental group I. For example, the coefficients indicate that a single male high school diploma graduate in mental group I who is black has a 7.7 percent higher probability of being in TB than does a white recruit with identical characteristics.

The columns headed AVIATION/TECH, ALL OTHER, and OPEN indicate similar marginal results for the given group. Reading across the table

the marginal results sum to zero* so we can see, for example, that the variable BLACK is positively related to TB but negatively related to ALL OTHER.

The results indicate that the probability of enlistment in TB is the same for mental groups IIA and IIB as it is for the base case, mental group I. (The signs on the coefficients are negative but not significant.) However, the probability of enlistment in TB is significantly lower for those in mental group IIIA. Both the COLLEGE and POST HIGH SCHOOL variables have negative coefficients but are not significant. Thus, most of the evidence with respect to the mental group and education variables, indicates that the highest quality recruits are not more likely to be in TB.

With respect to affirmative action objectives both blacks and females have significantly higher probabilities of being enlisted in TB. The female recruit is more likely to be in TB and less likely to have an open enlistment. This means that overall the female is more likely than the male to have a guarantee. In addition the TB program seems successful in drawing females into the technical areas. The black recruit is more likely to be in TB and less likely to be in ALL OTHER.** Thus, the black recruit is no more likely to have a guarantee than is the white recruit. However, the TB program most likely directs the black recruit into the technical areas***.

Hispanics, in contrast, are less likely to be in TB and more likely to be in ALL OTHER. It appears that TB is not being used to draw hispanics into the technical areas.****

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* Each recruit is in one of the four categories so for any given characteristic the probabililty of being in one of the four groups sums to one. The marginal results in the table show how each of the four probabilities change when the value of the characteristic in the table replaces the value of the same characteristic in the base case. The marginal effects sum to zero across each row in the table because the total probability is still equal to one. Thus, the increase in the probability of being in one group must be offset by a decrease in the probability of being in some other group.

** We also ran a logit analysis using the program categories TB, CB, OPEN, and ALL OTHER. The analysis was restricted to males qualified for TB because only males are eligible for CB. The coefficient on the BLACK variable was significant and positive for TB. It was negative for CB, but not significant.

*** Only about one-third of enlistments other than TB are assigned to the TB areas.

**** The HISPANIC variable is only significant at the 10 percent level.

In general, the results with respect to TB using the logit model agreed with the results using cross classification tables. The signs of the independent variables were the same. However, using the logit model we see that only some of the variables had effects that were statistically significant.

The logit results show that the probability of being in TB was significantly higher for those who were:*

- Female
- Black
- Married.

Besides being negatively related to age, the probability of being in TB was significantly lower for those who were

- In MG IIIA
- Hispanic.

SEPARATION FROM THE MARINE CORPS

Informal information indicated that the separation rate from the Marine Corps was high among recruits enlisted for the technical skills bonus. In this section of the chapter we compare the separation rates of those in TB with the separation rates of equally qualified recruits enlisted for other programs.

Because the average elapsed time before payment of the technical skills bonus is 14 months, we were interested in longer term separation rates.** The longer term rates allowed us to examine whether the probability of survival for those in TB dropped relative to recruits in other programs after the bonus had been paid. That is, did the bonus enlistees accept their bonus and then separate?

* This analysis allows us to examine how programs are distributed among recruits who made a decision to enlist. It does not enable us to determine if TB draws "new" people into the service. But if the proportion of "new" recruits among TB enlistments is at least as high for blacks as it is for whites, as our survey data suggests, then the percent of high quality blacks in the service is raised by TB. This follows because we determined that the qualified black recruit has a higher probability than the white recruit of being in TB.
** See appendix K for a similar analysis for recruits who enlisted in FY 1980.

Both boot camp graduation and survival through March 1981 were examined for recruits who enlisted in FY 1978. The latter date implies between 2-1/2 and 3-1/2 years had passed since enlistment. This allows sufficient time for recruits to complete school, receive eligible MOSs, and receive their bonus.*

Two logit models were run. The first treated boot camp graduation as the dependent variable, and the second treated survival through an average of 3 years from enlistment as the dependent variable.**

The independent variables included demographic characteristics and several variables that reflected the program group in which the recruit was enlisted. The enlistment programs included in the analysis were TB, CB, AVIATION/TECH, AVIATION/SUPPORT, and MECH/ELEC. The remaining options were combined as ALL OTHER.***

The background characteristics were as defined previously except an additional variable ENLISTMENT LENGTH was added. This variable took on the value 1 if the length of enlistment was 4 years or more and 0 otherwise.

Boot Camp Graduation

In this model the dependent variable was boot camp graduation (BOOT CAMP GRAD). This variable took on the value 1 if the recruit graduated from boot camp and 0 otherwise.

Table 28 indicates how each variable related to the probability of boot camp graduation compared to the base case—a single white, male, high school diploma graduate in mental group I with an open enlistment. As the asterisks indicate, several demographic variables were significantly related to boot camp graduation. Although all the program groups except AVIATION/SUPPORT had positive coefficients, none was statistically significant. Thus, none of the programs seem related to the probability of boot camp graduation.

* The information from USMC Headquarters allowed us to determine who was still in the Marine Corps. However, some of those enlisted in TB who were still in the service may not have satisfactorily completed the requirements to receive their bonus payment and may have served instead in ineligible MOSs.

** Those who separated after successfully completing 3-year terms were included with the survivors.

*** The groups included in ALL OTHER were GROUND FIELD, GROUND SUB, and CB COMPARISON.

TABLE 28

MARGINAL RESULTS FOR BOOT CAMP GRADUATION AND FOR SURVIVAL, "TB QUALIFIED" RECRUITS, FY 1978[a]

Characteristics	Boot camp graduation	Survival[b]
Mental Category		
IIA	-.007	.007
IIB	-.015	.003
IIIA	.007	.000
AGE	-.010[c]	-.016[c]
DELAYED ENTRY TIME	.0001[c]	.0004[c]
RACE/ETHNIC		
BLACK	-.009	-.042
HISPANIC	.027	.052
FEMALE	-.047[c]	-.205[c]
MARRIED	.003	.012
EDUCATION		
COLLEGE	.030	.1291[c]
CERTIFICATE	.043	.030
POST HIGH SCHOOL	.036[c]	.048[c]
PROGRAMS		
TB	.012	.034[d]
CB	.016	.055[d]
AVIATION/TECH	.016	.058[c]
AVIATION/SUPPORT	-.004	.069[c]
MECH/ELEC	.013	.046[c]
ALL OTHER	.019	.036[d]
ENLISTMENT LENGTH	.020	-.015
Percent Who Survived	91.5	81.9

[a]Base case: single, white, male, high school diploma graduate in mental group I with an OPEN enlistment.
[b]Survived through an average of 3 years from date of enlistment.
[c]Significant at the 5 percent level.
[d]Significant at the 10 percent level.

Survival

Survival through an average of 3 years from date of enlistment (SURVIVAL) was also entered as a dependent variable in a logit model. This variable took on the value 1 if the recruit survived and 0 otherwise. The set of independent variables was the same as used for boot camp graduation as the dependent variable.

The results of the logit analysis, shown in table 28, indicate the FEMALE variable is negatively related to SURVIVAL. Both COLLEGE and POST HIGH SCHOOL are positively related to SURVIVAL and significant. The TB and CB variables have coefficients that are positive and significant at the 10 percent level. This suggests that enlistment in either of these programs added to chances of survival compared to the base case. Thus, the data do not suggest that those in the bonus program drop out at an abnormally high rate.

One should note, however, that all the independent variables representing the program categories had statistically significant coefficients. Because the base case was an open enlistment these results demonstrate that those with guarantees were more likely to survive than were those with open enlistments. However, the coefficient for TB was the lowest of all the program coefficients. This suggests that being in TB added the least to the probability of survival over a long period of time. (This should be weighed against the extra expense involved with TB compared to the other guarantees.)

Time Before Separation

There was some question whether the payment of the bonus affects the timing of separation. Therefore we examined the time before separation for recruits who were shipped in FY 1978 but who separated prematurely. The pattern of time before separation for those in AVIATION/TECH, TB, and overall is shown in table 29. Both AVIATION/TECH and TB require 4-year enlistments and, in addition, include many of the same MOSs.

The time distribution of separations from TB and AVIATION/TECH were quite different. Separations from TB were proportionately higher between 3 months and 1-1/2 years but lower at the 0 to 3-month and over 1-1/2-year intervals. Note the high proportion of those in AVIATION/TECH who separated after 2 years. Compared to the overall distribution, those in TB again had higher separation rates at the 1- to 1-1/2-year interval and fewer at the 1-1/2- to 2-year interval. The 1- to 1-1/2-year interval is the time interval during which most recruits finish their training and are paid.

TABLE 29

TIMING OF SEPARATION FOR "TB QUALIFIED" RECRUITS
IN SELECTED PROGRAMS, FY 1978

Program	Early separation rate	Separated between 0 and 3 months	Separated between 3 months and 1 year	Separated between 1 and 1-1/2 years	Separated between 1-1/2 and 2 years	Separated after 2 years
AVIATION/TECH	.17	43.2	10.5	12.3	11.1	22.9
TB	.17	37.8	18.9	20.7	5.4	17.2
All	.18	38.8	16.0	15.1	12.4	17.7

The tendency of separations from TB to be high at the 1- to 1-1/2-year interval raises the important question of whether the separations occurred before or after the bonus payment had been made.* The information from USMC Headquarters used to construct table 29 did not allow this determination to be made because it did not indicate school graduation or bonus payment. However, the records did indicate the MOSs of the recruits. The MOSs of TB recruits from FY 1978 who had separated through March 1981 were examined. Overall, the percentage of paid dropouts from TB in FY 1978 appeared to be less than 2 percent.

To have some basis of comparison, the MOSs of those who were in AVIATION/TECH in FY 1978 and who separated were also examined. The loss of trained manpower from AVIATION/TECH appeared to be about 5 percent. Thus, this comparison indicates a greater loss of trained manpower from AVIATION/TECH than from TB and may indicate a higher school failure rate for those in TB.

SUMMARY

Logit analysis, a regression technique, was used to see which variables were significantly related to program allocation among recruits qualified for the technical skills bonus. Table 30 summarizes our results. We see that blacks, females, and married recruits were more likely to be enlisted in TB. Thus, it appears TB is being used to direct these groups into the more technical areas. While both blacks and those married were less likely to be in the OTHER category, females were less likely to have an OPEN enlistment. The group HISPANIC was less likely to be in TB and more likely to be in OTHER. Although those in mental group IIIA are less likely to be in TB, there is little other evidence that TB is given to the most qualified of these recruits in terms of mental group and education.

With respect to separations, evidence was examined from FY 1978. The FY 1978 data help us to determine whether TB recruits tend to accept their bonus and then separate. The results for FY 1978 indicate that TB had a positive relationship to survival through an average of 3 years from enlistment. The evidence also suggests that while separation from TB was high in the 1 to 1-1/2 year of service interval, most of those separating had NOT received eligible MOSs. There is no evidence that for TB recruits separation after bonus payment is a significant problem.

* In chapter 8 we examine some evidence on this point from USMC financial records.

TABLE 30

RELATIONSHIP BETWEEN DEMOGRAPHIC CHARACTERISTICS AND PROGRAMS, "TB QUALIFIED RECRUITS", FY 1980[a]

Characteristics	More likely to be enlisted in	Less likely to be enlisted in
Mental group		
IIA	-	-
IIB	-	-
IIIA	OPEN	TB
AGE[b]	OPEN	TB
DELAYED ENTRY TIME[b]	AVIATION/TECH	OPEN
RACE/ETHNIC		
BLACK	TB	OTHER
HISPANIC	OTHER	TB
FEMALE	TB	OPEN
MARRIED	TB	OTHER
EDUCATION		
COLLEGE	OTHER	-
CERTIFICATE	OPEN	AVIATION/TECH
CERT 5	OTHER	AVIATION/TECH

[a]Base case: single, white, male, high school diploma graduate in mental group I.
[b]This table shows the relationship to an increase in the value of the variable.

CHAPTER 8

PROGRAM ALLOCATION AND SURVIVAL AMONG RECRUITS QUALIFIED FOR THE COMBAT ARMS BONUS

In the last chapter we examined recruits qualified for the technical skills bonus program. In this chapter we examine recruits qualified for the combat arms enlistment bonus ("CB qualified" recruits). Again we focus on the following two questions:

- What were the characteristics of recruits who enlisted in the combat arms bonus program and how do these compare to the characteristics of recruits in other guarantee programs?

- Were enlistees in the combat arms bonus program more (less) likely to separate from the USMC than other equally qualified recruits?

As with the technical skills bonus, the combat arms bonus can be used to direct high quality recruits into areas considered desirable. The Marine Corps wants to direct high quality people into combat arms. The analysis described in this chapter helps determine whether the combat arms bonus has helped the Marine Corps meet this objective. We also examine race/ethnic characteristics of bonus recipients. In addition to an analysis of program allocation this chapter deals with early separation from the Marine Corps among recruits in the combat arms bonus program.

The data on program allocation were obtained from recruits who enlisted in FY 1980, while the data on separations were obtained from recruits who enlisted in FY 1978. We present descriptive tables and logit results.

PROGRAM ALLOCATION AMONG RECRUITS QUALIFIED FOR THE COMBAT ARMS BONUS, FY 1980

The combat arms bonus is available to high school graduate male recruits with AFQT scores of 31 or above and GT scores of 90. Holders of General Educational Development (GED) certificates are eligible if they have GT scores of 95. In FY 1980, 24,427 recruits were accessed who met these qualifications. Of these, 7.7 percent enlisted for the combat arms bonus, 3.6 percent enlisted for the technical skills bonus, while 41 percent were open enlistments. Table 31 shows the frequency and percent of the "CB qualified" recruits who were in each of the 22 possible programs in FY 1980. Note that other than open enlistments, the combat arms bonus (CB) accounted for the largest percent of the recruits. The percent distribution of all recruits is repeated for comparison purposes.

TABLE 31

PROGRAM ALLOCATION FOR "CB QUALIFIED" RECRUITS[a] AND FOR ALL RECRUITS, FY 1980

Program	"CB Qualified" recruits (frequency)	"CB Qualified" recruits (percent)	All recruits (percent)
Avionics	995	4.1	2.8
Air ordnance	137	0.6	0.4
Air support	818	3.4	2.9
Air technical support	663	2.7	2.0
Aircraft maintenance	1,693	7.0	5.2
CB	1,891	7.7	5.0
TB	878	3.6	2.4
Combat support	649	2.7	2.3
Administration	589	2.4	2.6
Logistics	667	2.7	2.7
Mechanical/ Electrical	1,692	6.9	5.5
Nonbonus combat	209	0.9	1.4
Infantry	740	3.0	2.6
Personnel	288	1.2	1.2
Motor transport	634	2.6	2.1
Radio communication	585	2.4	2.2
Electronics	324	1.3	0.9
Food	249	1.0	1.2
Computer	125	0.5	0.4
Military police	326	1.3	0.8
Open	10,019	41.0	52.8
Other	255	1.0	0.8
All	24,427	100.0	100.0

[a]Qualifications for HSG: AFQT = 31, GT=90; GED: AFQT = 31, GT=95.

Characteristics of "CB Qualified" Recruits by Program Group

This section presents information on the characteristics of "CB qualified" recruits, excluding GEDs. Recruits in the various program groups are compared according to length of enlistment, time in the delayed entry program, marital status, race, education, and mental group.

Table 32 shows the frequency and percent distribution of high school graduate recruits for the ten program categories discussed in chapter 6.* The data on length of enlistment show a sharp contrast between CB, which had 100 percent 4-year enlistments and the CB comparison group, which had only 41.4 percent. The latter was the lowest for any of the program groups.

The percent with delay time greater than 6 months was below average for CB. However, the CB comparison group had the smallest proportion of recruits with delay time greater than 6 months. Again, the aviation groups and the MECH/ELEC group had the highest proportion of recruits with long delay times, which reflects the willingness of recruits to wait for these guarantees.

Both the percent married and the percent black were below average for CB.

Information on the mental group distribution of CB recruits shows they were almost evenly split with one-third in mental groups I and II one-third in mental group IIIA and one-third in mental group IIIB. This was quite similar to both the overall distribution and to the distribution of those in the CB comparison group (table 33).

With respect to education, CB was slightly above average in the percent who were in the GED education category and in the post high school education category. CB was below average with respect to the percent of those with certificates of high school completion.

In summary, the "CB qualified" recruits who were enlisted in CB were more likely than the overall to be:

- Single
- White
- In mental group I or mental group IIIA
- In the POST HIGH SCHOOL or GED education categories.

* GEDs are excluded from this table. Appendix I presents similar information for "CB qualified" recruits including GEDs.

TABLE 32

CHARACTERISTICS OF "CB QUALIFIED" HIGH SCHOOL GRADUATE RECRUITS BY PROGRAM GROUPS, FY 1980

Program	Frequency	Percent	Percent ≥ 4-year enlistment	Percent delay time > 6 months	Percent black	Percent married	Percent[a] high school graduate
AVIATION/ SUPPORT	2,446	10.6	100.0	55.7	20.2	3.4	97.4
AVIATION/TECH	1,751	7.5	100.0	41.8	7.7	3.8	97.5
CB	1,784	7.7	100.0	26.7	11.0	3.8	94.3
CB COMPARISON	1,518	6.5	41.4	19.9	6.3	3.0	95.0
GROUND FIELD	1,474	6.4	79.2	38.9	20.3	4.3	98.5
GROUND SUB	1,228	5.3	48.8	39.4	37.9	5.3	97.8
MECH/ELEC	2,699	11.6	91.1	44.8	20.4	3.8	99.0
OPEN	9,175	39.5	57.3	12.8	25.4	4.5	91.6
OTHER	252	1.1	81.3	21.1	5.6	2.4	99.2
TB	876	3.8	100.0	24.7	4.9	5.5	99.8
All	23,203	100.0	73.7	28.4	19.9	4.1	95.0

[a]Excludes GEDs.

TABLE 33

MENTAL GROUP DISTRIBUTION FOR SELECTED PROGRAM GROUPS "CB QUALIFIED RECRUITS," FY 1980

Program	Mental Group Category					
	I	IIA	IIB	IIIA	IIIB	ALL
CB	5.9	5.9	21.5	34.0	32.7	100.0
CB COMPARISON	3.4	8.0	21.7	35.5	31.4	100.0
OPEN	3.5	5.2	18.2	31.1	42.0	100.0
All	4.3	6.6	21.2	32.7	35.2	100.0

They were less likely to be

- Black
- In mental group IIA or mental group IIIB
- In the CERTIFICATE education category.

They were also less likely to have delay times greater than 6 months.

The most striking differences between the CB and CB comparison groups were the high proportion of the latter who had enlistments for less than 4 years and the much higher proportion of CB that was black.

Logit Results for Program Allocation

Logit analysis was again used to gain additional information on program allocation. Enlistment programs were divided into four categories. These were combat arms bonus (CB), technical skills bonus(TB), other programs (ALL OTHER), and open enlistments (OPEN).

For this analysis a 20 percent random sample of all "CB qualified" recruits was taken. We had 4,908 observations. The probabilities of being in each of the four categories for all "CB qualified" recruits and for the sample are shown in table 34.

The set of independent variables was similar to that used for the analysis of "TB qualified" recruits. AGE and DELAYED ENTRY were entered as continuous variables while the remainder were entered as dichotomous variables. Variables MG I through MG IIIB represent the mental group categories. BLACK and HISPANIC represent nonwhite recruits. HISPANIC includes both hispanics and others. The education variables were COLLEGE, CERTIFICATE, POST HIGH SCHOOL, and GED. The latter contains

TABLE 34

MARGINAL RESULTS FOR PROGRAM ENLISTMENT[a]
"CB QUALIFIED" RECRUITS, FY 1980[b]

Characteristics	CB	TB	OTHER	OPEN
Mental Group				
II A	.026	-.008	.050	-.069
II B	.018	-.041[c]	.067[d]	-.044
III A	.023	-.099[c]	.053	.023
III B	.027	-.198[c]	.030	.142[c]
AGE	-.007[c]	-.001	-.000	.009[d]
DELAYED ENTRY TIME	.000	.000	.002[c]	-.002[c]
RACE/ETHNIC				
BLACK	-.045[c]	-.012	-.017	.074[c]
HISPANIC	-.027	-.071[c]	.050	.047
MARRIED	-.023	.007	.084[c]	-.068[d]
EDUCATION				
COLLEGE	.052	-.019	-.024	-.008
CERTIFICATE	-.016	-.001	-.205[c]	.223[c]
POST HIGH SCHOOL	.043[c]	.006	-.011	-.039
GED	.007	-.071[c]	-.197[c]	.260[c]
Percent in Category				
All	7.7	3.6	47.7	41.0
Sample	7.8	3.6	47.0	41.6

[a]Base case: single, white, male, high school diploma graduate, mental group I.
[b]N = 4,908.
[c]Significant at the 5 percent level.
[d]Significant at the 10 percent level.

recruits with certificates of high school equivalency. The other education categories are as defined previously.

Table 34 shows how each of these independent variables related to the probability of being in the 4 program categories. Variables with significant coefficients are indicated.

The values in column 1 indicate the marginal effect of each independent variable on the probability of being in the combat arms bonus program compared to the base case.

None of the mental group variables were related to the probability of being in CB. Thus, the recruit in mental groups IIIA and IIIB had the same chance of having enlisted for the combat arms bonus as did the recruit in mental groups I or II. This suggests that the potential of CB to draw high quality recruits is not being fully utilized.

With respect to education, those in the post high school education category did have a higher probability of enlistment in CB compared to the base case—a high school diploma graduate. However, because neither the CERTIFICATE nor GED variables were significant, the results imply that both groups were as likely as the high school diploma graduate to be in CB. Again, the potential of CB to draw high quality recruits is not being exploited.

The variable BLACK had a significant negative relationship with CB and a significant positive relationship with OPEN. This suggests that the black recruits in this group had a lower probability than white recruits of entering with a guarantee, particularly CB. The HISPANIC variable was negatively related to TB but not significantly related to the other groups.

SEPARATION FROM THE MARINE CORPS

To gain information on separations, regression analysis* was conducted for both boot camp graduation (BOOT CAMP GRAD) and survival through March 1981 (SURVIVAL). Data from recruits who enlisted in FY 1978 were examined. This implies an average of 3 years had passed from date of enlistment.

The independent variables included the background characteristics defined previously. Variables representing the program groups CB, TB, CB COMPARISON, AVIATION/SUPPORT, AVIATION/TECH, MECH/ELEC, and ALL OTHER were also included. The comparison group was an open enlistment.

* Ordinary least squares regression was used here because we judged that the number of observations (24,427) was too great for logit analysis.

Boot Camp Graduation

Here the dependent variable was the probability that a recruit with a given set of characteristics would graduate from boot camp. The dependent variable, BOOT CAMP GRAD, took on the value 1 if the recruit graduated and 0 otherwise.

Table 35 shows how each independent variable related to the probability of boot camp graduation compared to the base case.

Several background characteristic variables were significantly related to boot camp graduation. The variables for mental groups IIB, IIIA, and IIIB were all negatively related to boot camp graduation, as were the variables, MARRIED and GED. HISPANIC and POST HIGH SCHOOL were both positively related to boot camp graduation.

All the program groups except OTHER and CB were positively related to boot camp graduation. This means that the recruit in CB had the same chance of graduating from boot camp as did the recruit with an OPEN enlistment. Note that the recruit in the CB comparison group had a significantly higher chance of graduating.

Survival

The dependent variable SURVIVAL took on the value 1 if the recruit had not separated through an average of 3 years from date of enlistment and 0 if the recruit had separated.*

The results are similar to those for BOOT CAMP GRAD. The same mental group categories and the GED variables were negatively related to SURVIVAL. The MARRIED variable was no longer significant but the BLACK variable was. The latter had a significant negative coefficient. The variables HISPANIC and POST HIGH SCHOOL were both positively related to SURVIVAL.

For the regression with SURVIVAL as the dependent variable all program variables including CB had significant positive coefficients. This implies that over a longer period of time recruits in CB had a higher chance of surviving than recruits with an OPEN enlistment. Note that the same is true for the CB comparison group.

Time Before Separation

Evidence on the timing of separation indicated that a higher proportion of CB than of the CB comparison group separated in the period

* Those who successfully completed 3-year terms were included with the other survivors.

TABLE 35

MARGINAL RESULTS FOR BOOT CAMP GRADUATION AND FOR SURVIVAL, "CB QUALIFIED" RECRUITS, FY 1978[a]

Characteristics	Boot camp graduation	Survival[b]
Mental Group		
IIA	-.011	-.006
IIB	-.019[c]	-.024[c]
IIIA	-.033[d]	-.057[d]
IIIB	-.059[d]	-.086[d]
AGE	-.022[d]	-.024[d]
DELAYED ENTRY TIME	.0001[d]	.0003[d]
RACE/ETHNIC		
BLACK	.009	-.032[d]
HISPANIC	.036[d]	.073[d]
MARRIED	-.025[d]	-.021
EDUCATION		
GED	-.089[d]	-.159[d]
COLLEGE	.000	.074[d]
CERTIFICATE	.022	-.038
POST HIGH SCHOOL	.044[d]	.051[d]
PROGRAMS		
TB	.021[c]	.048[d]
CB	.010	.029[d]
CB COMPARISON	.025[d]	.034[d]
AVIATION/TECH	.030[d]	.073[d]
AVIATION/SUPPORT	.031[d]	.078[d]
MECH/ELEC	.027[d]	.070[d]
ALL OTHER	.010	.031[d]
ENLISTMENT LENGTH	-.006	-.017[d]
Percent Survived	.887	.765

[a]Base case: single, white, male, high school diploma graduate in mental group I with an OPEN enlistment.
[b]Survived through an average of 3 years from date of enlistment.
[c]Significant at the 10 percent level.
[d]Significant at the 5 percent level.

before 3 months and in the 1-1/2- to 2-year period. The rate of separation among those who were trained was roughly similar. It was 10 percent for CB and 9.4 percent for the CB comparison group. (See appendix I.)

SUMMARY

A logit analysis was conducted to see which variables were significantly related to program selection for recruits qualified for the combat arms bonus. The results indicate that blacks had a lower chance of being in CB and were more likely to have an OPEN enlistment. While POST HIGH SCHOOL was positively related to CB none of the other education or mental group variables were. Thus, enlistment in CB is not more likely among the highest quality of these recruits. Table 36 summarizes the results.

TABLE 36

RELATIONSHIP BETWEEN DEMOGRAPHIC CHARACTERISTICS AND PROGRAMS, "CB QUALIFIED" RECRUITS, FY 1980[a]

Characteristics	More likely to be enlisted in	Less likely to be enlisted in
Mental Group		
IIA	-	-
IIB	OTHER	TB
IIIA	-	TB
IIIB	OPEN	TB
AGE[b]	OPEN	CB
DELAYED ENTRY TIME[b]	OTHER	OPEN
RACE/ETHNIC		
BLACK	OPEN	CB
HISPANIC		TB
MARRIED	OTHER	OPEN
EDUCATION		
COLLEGE	-	-
CERTIFICATE	OPEN	OTHER
POST HIGH SCHOOL	CB	-
GED	OPEN	TB, OTHER

[a]Base case: single, white, male, high school diploma graduate in mental group I.
[b]This table shows the relationship to an increase in the value of the variable.

With respect to survival, FY 1978 results show that enlistment in CB, compared to an OPEN enlistment, increased the probability of survival through an average of 3 years from enlistment. The coefficients were similar for the CB and CB comparison groups.

CHAPTER 9

DEMOGRAPHIC INFORMATION AND SURVIVAL ANALYSIS FOR BONUS RECRUITS

While the previous chapters described recruits enlisted for either the technical skills bonus or the combat arms bonus in FY 1980, this chapter provides additional descriptive information on bonus recruits who enlisted in FY 1978, FY 1979, or FY 1980. In addition, we examine separations from the program. Here we concentrate on the specific characteristics that contribute to survival for recruits in the enlistment bonus program. We present results of regression analyses with boot camp graduation and survival in the Marine Corps used alternatively as dependent variables. To gain additional information on program survival, we also examine records from the USMC financial center.

RECRUITS ENLISTED FOR THE TECHNICAL SKILLS BONUS, FY 1978-1980

Descriptive Information

When the records of all "TB qualified" recruits were examined there were fewer than the expected number of recruits enlisted for TB. This indicated that several of the recruits in TB did not meet one or more of the program qualifications. For this reason, the records of all TB recruits with 4-year enlistment codes were examined. (6-year bonus options were not included.)

Appendix L displays some of the demographic information on these recruits. Here we review test scores, education codes, race, and sex.

The data indicate that a rather large number of recruits did not have the required EL score of 120. This figure was about 20 percent in FY 1978 and had dropped to the 10 percent level by FY 1980.

Two explanations seem likely. First, prior to FY 1978 the conversion tables used at the AFEES were different from the conversion tables used at the depot, which allowed some recruits with low scores to be accepted into TB.

Second, in FY 1977 recruiters were allowed to add 10 points to the scores of recruits who were high school graduates when determining eligibility for the various enlistment options. This gave a 10-point advantage for HSGs compared to non-HSGs. However, because the technical skills enlistment bonus is open only to HSGs the 10-point advantage was not to be considered for the EL score when determining eligibility for TB. This was confusing and allowed some recruits to be accessed with minimum EL scores of 110 rather than 120.

It also appears that several recruits, about 3 percent, did not have the required GT score of 110. Almost all the recruits met the AFQT score requirement of 50 and only a small number of recruits did not meet the education level requirement.

The data indicate that the mental group distribution of TB recruits changed very little over the 3 years, while the proportion of recruits in the POST HIGH SCHOOL category increased. This category includes those with some college and generally 13 or more years of education.

The data show a slight increase in the proportion female. However, both the proportion hispanic and the proportion black fell.

Unqualified Recruits

In total there were 128 recruits who failed to meet one or more of the entrance criteria in FY 1980. This was about 13 percent of those in TB. Eleven percent of the unqualified recruits were black compared to 5 percent overall. In spite of the lack of appropriate qualifications, the percent separated was only 10 percent compared to 9 percent overall.

Separation From the USMC for Recruits in TB

We examined regressions for recruits in TB in FY 1978 to determine the effect of various demographic characteristics on both boot camp graduation and survival in the USMC through March 1981 (an average of 3 years from date of enlistment).

Several independent variables were included in the regressions. Categories were included for mental group score, race, sex, and education. For these regressions, other education (OTHER ED) included those without a high school diploma or certificate.

Table 37 shows the coefficients for the regressions. Only AGE and BLACK were significantly related to boot camp graduation. While AGE was negatively related, BLACK was positively related.

Three variables were significantly related to SURVIVAL. SURVIVAL was negatively related to AGE. It was significantly lower for females and positively related to DELAYED ENTRY TIME. The coefficient on the female variable is quite large. This is similar to the finding reported in table 28 for all "TB qualified" recruits.

TABLE 37

MARGINAL RESULTS FOR BOOT CAMP GRADUATION AND FOR SURVIVAL FOR RECRUITS IN TB, FY 1978[a]

Characteristics	Boot Camp Graduation	Survival[b]
Mental Group		
IIA	-.023	.015
IIB	-.035	-.005
IIIA	-.044	.005
IIIB	.016	-.061
AGE	-.013[c]	-.028[d]
DELAYED ENTRY TIME	.000	.0003[d]
RACE/ETHNIC		
BLACK	.076[c]	-.004
HISPANIC	.029	.015
FEMALE	.003	-.218[d]
MARRIED	.032	.110
EDUCATION		
COLLEGE	.115	.034
POST HIGH SCHOOL	.053	.032
OTHER EDUCATION	-.023	-.010
Percent Who Survived	.93	.82

[a]Base case: single, white, male high school diploma graduate in mental group I.
[b]Survival through an average of 3 years from date of enlistment.
[c]Significant at the 10 percent level.
[d]Significant at the 5 percent level.

RECRUITS ENLISTED FOR THE COMBAT ARMS BONUS, FY 1978-1980

Descriptive Information

In this section we review various descriptive material for recruits in the combat arms bonus program for the fiscal years 1978, 1979, and 1980. (See appendix L for supporting tables.)

The problem of recruits with test scores that did not qualify them to be in CB seems minor. While almost 5 percent lacked a GT score of 90 in FY 1978, by FY 1980 this figure was only 1 percent. However, there were a fair number of recruits who lacked the appropriate education codes. The proportion of those with ineligible education codes increased from 2.6 percent in FY 1978 to 4.6 percent in FY 1980. There also seemed to be an increase in those in the POST HIGH SCHOOL and GED categories. Those with the CERTIFICATE code increased greatly in FY 1979 but fell by FY 1980.

The percentage of recruits in CB who were black fell quite a bit between 1978 and 1980. The percentage of hispanics fell slightly.

Unqualified Recruits

There were 116 unqualified recruits in CB in FY 1980. This was less than 6 percent of the total. Of the unqualified recruits almost 32 percent were black compared to 12 percent black overall. The separation rate for the unqualified recruits was 15.5 percent compared to 12.7 percent overall. About 80 percent of the unqualified CB recruits had inappropriate education codes and another 18 percent lacked the correct GT score (Only one GED failed to have a 95).

Separation from USMC for Recruits in CB

We examined regressions to determine the effect of various demographic characteristics on both boot camp graduation and survival in the USMC through March 1981 for recruits in CB in FY 1978. For these regressions other education (OTHER ED) included those with ineligible education codes, i.e., those who lacked a high school diploma or certificate or a GED certificate.

Table 38 shows the coefficients for these regressions. Boot camp graduation was positively related to DELAYED ENTRY TIME. It was negatively related to AGE, MARRIED, MG IIIA, and MG IIIB. The variable SURVIVAL was positively related to DELAYED ENTRY and POST HIGH SCHOOL. SURVIVAL was negatively related to MG IIA, MG IIIA, MG IIIB, and AGE. The variable BLACK also had a significant negative coefficient.

TABLE 38

MARGINAL RESULTS FOR BOOT CAMP GRADUATION AND FOR SURVIVAL FOR RECRUITS IN CB, FY 1978[a]

Characteristics	Boot Camp Graduation	Survival[b]
Mental Group		
IIA	-.054	-.106[c]
IIB	-.046	-.067
IIIA	-.084[d]	-.122[d]
IIIB	-.067[d]	-.111[d]
IV	-.007	.032
AGE	-.011[d]	-.012[d]
DELAYED ENTRY TIME	.0003[d]	.001[d]
RACE/ETHNIC		
BLACK	.015	-.063[d]
HISPANIC	-.018	.005
MARRIED	-.090[d]	-.052
EDUCATION		
CERTIFICATE	.001	-.189
POST HIGH SCHOOL	.043	.105[c]
GED	.002	-.060
OTHER EDUCATION	-.014	-.042
Percent Who Survived	.90	.77

[a]Base case: single, white, male, high school diploma graduate in mental group I.
[b]Survival through an average of 3 years from date of enlistment.
[c]Significant at the 10 percent level.
[d]Significant at the 5 percent level.

Evidence on Program Survival From Marine Corps Finance Center Records

The project study plan called for an analysis of recruits in the bonus program to determine the characteristics of those who successfully completed the program and those who dropped out. Payment of the bonus was to be taken as an indication of successful program completion. The recruit is paid his bonus after training is completed and a bonus designated MOS is assigned. The Marine Corps Finance Center at Kansas City made an account of computerized payment records available to CNA in late August 1981. Unfortunately, the financial center did not begin to keep a computerized account of payments until April 1979. The records we received indicated 3,621 payments for combat arms and 1,394 payments for technical skills.

What is of interest is the rather large number of payments made to recruits whose program code was something other than CB or TB. In all, 5.4 percent of the TB payments were to recruits with codes other than TB and 3.2 percent of the CB payments were to recruits with codes other than CB.

Payment to the recruit is not made by the Finance Center. It is made at the local duty station. However, verification of the payment must be sent to Kansas City. This includes a statement from the Commanding Officer that the recruit has a 4 year enlistment and has been assigned an MOS eligible for a bonus. Kansas City does not rely on program codes as part of verification.

To determine which of the TB and CB recruits were "successful" the information received from Kansas City was combined with information from HQMC.

This required choosing a suitable time period of active duty base dates so that the Finance Center would have recorded the payment and the recruit would have had enough time to complete training and be assigned his MOS. We chose the time period from December 1978 to September 1979 for the technical skills bonus.

HQMC recorded 843 recruits with TB program codes for the selected time interval.* Using a Delayed Entry Program (DEP) dropout rate of 11 percent, the figures for recruits scheduled to ship in FY 1979 are presented in table 39. The figures for FY 1979 indicate that if adequate allowance is not made for dropouts from the DEP program, for early separations from the USMC and for those who fail to receive eligible MOSs, only about 60 percent of the funds allocated for TB will be used. (While 5 percent of the recruits had training MOSs on their

* Allowing for missing and incomplete records we estimated a dropout rate from the Delayed Entry Program (DEP) to be between 10 and 13 percent.

records such a long period of time had passed that it is doubtful they will be paid.)

TABLE 39

PROGRAM COMPLETION RATES
FOR TB RECRUITS SCHEDULED TO SHIP IN FY 1979[a,b]

	Percent of all	Percent of those shipped
Delayed Entry Program dropouts	11	-
Paid and survived	61	69
Paid and left USMC	1	1
Not Paid		
Left USMC	11	13
Received ineligible MOSs	11	12
Have training MOSs	5	5
	100	100

[a]Based on analysis of information from USMC Finance Center.
[b]An average of 2-1/2 years from date of enlistment.

Note also that the problem of paying recruits who then leave the Marine Corps seems quite small for TB recruits. After an average of 2-1/2 years of service only 1 percent of TB recruits fell into this category.

A similar type of analysis was conducted for recruits in the combat arms bonus program. The time period used was March 1979 through February 1980, an average of 1-1/2 years from the date of enlistment. Table 40 is based on the records of 1,999 recruits. These results indicate that unlike TB there are very few recruits who remain in the Marine Corps while failing to receive eligible MOSs. However, the proportion who are paid and then separate is higher. After 1-1/2 years it is about 5 percent of those in the program.

SUMMARY

The data indicate that many of the recruits in the Enlistment Bonus Program do not meet the entrance criteria. For example, in FY 1980, about 13 percent of those in TB and 6 percent of those in CB failed to meet all the qualifications. For TB the criterion most often lacking was the EL score while for CB it was the education requirement. Evidence from FY 1978 on program survival indicates that the variable

FEMALE is negatively related to survival in TB while the variable BLACK is negatively related to survival in CB.

TABLE 40

PROGRAM COMPLETION RATES FOR CB RECRUITS
SCHEDULED TO SHIP BETWEEN MARCH 1979 AND FEBRUARY 1980[a,b]

	Percent of all	Percent of those shipped
Delayed Entry Program dropouts	10	-
Paid and survived	73	81
Paid and left USMC	4	5
Not Paid		
Left USMC	12	13
Received ineligible MOS	1	1
	100	100

[a]Based on analysis of information from USMC Finance Center.
[b]An average of 1-1/2 years from date of enlistment.

Evidence from the Marine Corps Finance Center indicates that a large proportion of the funds allocated for TB and CB is not used because of dropouts from the DEP program and separations from the Marine Corps. TB funds are also underutilized because of failure to receive eligible MOSs. Quotas should be set so that funds will be used in spite of these losses.

CHAPTER 10

SUMMARY

Since 1972 the U.S. Marine Corps has provided monetary bonuses as an incentive to increase enlistments. In this report we examined the effect of the Enlistment Bonus Program on high quality enlistments. We assessed the cost effectiveness of using bonuses to increase the overall supply of recruits as well as to increase the supply of recruits in the bonus areas —combat arms and technical skills. We also examined the effect of the program on affirmative action and on separations from the Marine Corps.

In this chapter we briefly describe the program as it existed when our study began. We also review our study results.

PROGRAM DESCRIPTION

The Enlistment Bonus Program (EBP) has typically distinguished between the Combat Arms Enlistment Bonus (CB) and the Technical Skills Enlistment Bonus (TB). The Combat Arms Bonus requires the recruit be in Mental Group IIIB or above. Because the Technical Skills Bonus requires an Electronics (EL) score of 120 the TB recruit will usually be in Mental Group I or II. Both CB and TB require a 4-year enlistment and promise in return, training and a job in an EBP designated MOS. The bonus payment is made in lump sum after training has been completed and the EBP designated MOS has been assigned. The monetary payments in FY 1980 were $2,500 for CB and $1,500 for TB. The quota for CB has usually been about 2,300. The quota for TB has been around 1,200. The quotas are small, therefore, only some fraction of qualified recruits are enlisted in the bonus program. Those not in the EBP enter other nonmonetary options or enlist without guarantees. The latter are referred to as "open" enlistments. Some, but not all, of the nonmonetary options require 4-year enlistments.

ENLISTMENT SUPPLY EFFECTS

A review of previous studies provided a wide range of answers with respect to the effect of bonuses on enlistment supply. Previous survey studies of Army and Marine Corps Combat Arms enlistment bonus programs indicate that 2 to 17 percent of those who enlisted for a $1,500 bonus and 6 to 21 percent for a $2,500 bonus would not have enlisted otherwise. Regression studies provide a range of results that is even wider.

Our own estimates were based on three types of evidence. These included surveys, pay elasticity calculations and regression results.

The survey data* we analyzed were collected from USMC recruits in FY 1979 by the Rand Corporation for the Department of Defense. To distinguish between the technical skills bonus and the combat arms bonus, we divided the survey results between those indicating their bonus would be $1,500 and those indicating their bonus would be $2,500. The results indicate that 5 percent of the $1,500 bonus recruits and 10 percent of the $2,500 bonus recruits would not have enlisted if there were no bonus program. The proportion who would not have selected a job in their bonus area was 28 percent for both the $1,500 and $2,500 bonus recruits. (Previous studies suggest this figure to be in the 20 to 49 percent range.)**

The pay elasticity calculations*** gave results that were consistent with the survey results. We estimated that the technical skills bonus resulted in between 3 and 7 new TB recruits per 100 bonus enlistments while the combat arms bonus resulted in between 6 and 12 new CB recruits per 100 bonus enlistments.

Our results using regression analysis were not entirely satisfactory. Using the independent variable, TB count**** we were able to estimate that 100 technical skills bonus enlistments would result in 23 new high school graduate recruits in mental groups I and II. A similar variable for the combat arms bonus gave results that were too high to be usable. Table 41 summarizes our results for the effect of the bonuses on enlistment supply.

RESULTS FOR COST-EFFECTIVENESS ANALYSIS

Because there is uncertainty concerning the number of new men per 100 that a $3,000 bonus***** would generate, cost-effectiveness figures were calculated for bonuses that were assumed to generate 5, 10, and 20 new men. Separate figures were calculated for TB and CB. This was necessary because the two bonuses differ in the probability that a recruit will extend his contract by 1 year to get into the bonus

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* Attitude questions on these surveys indicate that the bonus recruits had more savings and higher family income than nonbonus recruits. A higher proportion of the bonus group also expressed satisfaction with the military job for which they signed up.

** When we restricted our data to black recruits we found that 13 percent were "new" to the service and 41 percent were "new" to the jobs.

*** These figures reflect the effect of the TB and CB bonuses on enlistments in FY 1979, the same year as the survey data.

**** This variable is the number of technical skills bonus contracts signed in each month entered in log form. The log linear model we used implies that the ability to attract "new" recruits will fall as the quota for TB increases.

***** We used the figure of $3,000 in our calculations because this amount is more representative of the current bonus program.

program. A higher proportion of recruits selecting combat jobs would sign 3-year contracts in the absence of the bonus. Thus, the contract lengthening effect for the combat arms bonus is much greater than for the technical skills bonus. The bonuses also differ in the length of training that recruits typically receive.

TABLE 41

SUMMARY OF RESULTS WITH RESPECT TO ENLISTMENT SUPPLY

	Number of new qualified recruits per 100 bonus enlistments	
	TB	CB
Survey results	5	10
Pay elasticity calculations	3-7	6-12
Regression	23	Not Usable

If the bonuses result in 10 new men per 100 enlistments, the cost per equivalent of an additional 4-year enlistment was calculated as $14,674 for TB and $8,958 for CB.*

We also estimated, based on survey data, that 30 of 100 bonus enlistees** were new to the bonus area. The cost per equivalent of an additional 4-year enlistment was then calculated as $7,338 for technical skills and $5,192 for combat arms.

Finally, we estimated the cost per equivalent of an additional 4-year enlistment as $12,840 for the FY 1982 bonus program. This program has several bonus levels varying from $1,500 to $5,000.

Compared to other means of generating increased enlistments, bonuses are probably cheaper than the GI Bill but more expensive than recruiters or advertising. However, bonuses have the advantage that

* To be complete the cost-effectiveness analysis should accurately measure the useful service life of those in the bonus program compared to other recruits. These calculations would reflect differential separation rates and reenlistment rates. Our data set did not extend far enough to estimate these rates. However, we do present evidence that the separation rates for those in TB and CB are lower than for open enlistments and not unlike those in comparable options. (See Chapters 7 and 8.)

** This was the figure we got when all surveys were combined.

they can be easily targeted to particular quality groups and particular skills.

CHARACTERISTICS OF BONUS RECRUITS

Because the Marine Corps lacked demographic information on the recruits who were in the bonus program one of our objectives was to provide this information. With respect to all recruits who enlisted in FY 1980 we presented evidence on the quality of recruits in the EBP compared to recruits in comparable programs. This comparison was favorable to the EBP reflecting, at least partly, the differences in qualifications between the EBP and the other guarantee programs.

We then restricted our attention to recruits "qualified" for the technical skills bonus and combat arms bonus. Here we looked to see if the bonuses were given to the highest quality recruits of those eligible. We also examined the use of the bonuses with respect to affirmative action objectives. Finally, we looked at the separation rates of those in the EBP compared to those in other programs.

All Enlistments, FY 1980

We began by looking at all recruits who enlisted in FY 1980. Recruits in the EBP were compared to recruits in similar options (chapter 6).

While CB requires a 4-year enlistment only 40 percent of enlistments in the comparable options, nonbonus combat (Z6), and infantry (G1) were for 4 years. CB had a much higher proportion of high school graduates. The quality of recruits based on the mental group distribution of high school graduates was also higher in CB than in the nonbonus combat option but about the same between CB and infantry. In addition, the percent black was higher in CB than in either of the comparable options.

We compared TB to avionics (A5) and electronics (G5). Both options require 4-year enlistments, as does TB. And all three programs had more than 90 percent high school graduates.

The most striking differences between those in TB and those in avionics and electronics were in the mental group distributions. Only about 10 percent of the TB recruits were in mental group IIIA or IIIB compared to 36 percent of those in avionics and 46 percent of those in electronics.

While these comparisons are favorable to CB and TB, it is unclear whether the bonus program merely moved recruits out of comparable

options* or whether they actually raised the overall quality of recruits.

Recruits Qualified for TB

We then restricted our attention to all recruits "qualified" for the technical skills bonus (chapter 7).** Of these recruits, approximately 18 percent were in TB, while almost 30 percent were "open" enlistments.

We used a regression technique, logit analysis, to see which characteristics were related to enlistment in TB rather than the other programs. The programs were grouped into four categories. Besides TB, the categories were the technical aviation programs, open enlistments, and all other programs.***

Although those in mental group IIIA had a lower probability of being in TB, there was little other evidence that enlistment in TB was given to the most qualified recruits. Those in mental group II and those with post high school or college education had the same chance of being in TB as the base case. The base case was a white, male, high school diploma graduate in mental group I. However, because the qualifications for enlistment in TB are so high all of the recruits in TB can be considered quality enlistments.

With respect to affirmative action objectives both blacks and females had significantly higher probabilities of being enlisted in TB. The female recruit was more likely to be in TB and less likely to have an open enlistment. This means that overall the female was more likely than the male to have a program guarantee. The black recruit was more likely to be in TB and less likely to be in the residual category, other programs. Thus, the black recruit was no more likely to have a guarantee than was the white recruit. However, the TB program most likely directed the black recruit into the technical areas. The

* The percentages of quota sold were quite low for the nonbonus combat and infantry options suggesting that recruits may have been moved out of these options into CB.

** In FY 1980 there were 4,495 recruits qualified for the technical skills bonus program.

*** In this analysis we examine how programs are distributed among recruits who decide to enlist. This does not enable us to determine if TB draws "new" people into the service. However, if we determine, for example, that the qualified black recruit has a higher probability than the white recruit of being in TB, and if the proportion of "new" recruits among TB enlistments is at least as high for blacks as it is for whites, as our survey data suggest, then the percent of blacks in the service is raised by TB.

opposite is true for hispanics. They were more likely to be in other programs and less likely to be in TB.

We found no evidence that separation rates were unusually high for those in TB. With respect to survival through an average of 3 years from date of enlistment, the TB variable had a coefficient that was positive and significant. This suggests that enlistment in TB added to survival chances compared to the base case, an open enlistment.*

We also examined the time pattern of separations for those in TB as compared to those in the technical aviation programs. We found that separations from TB were higher in the 1-year to 1-1/2-year category. However, an examination of the MOSs of the dropouts from TB indicated that only about 2 percent were paid dropouts. In contrast, about 5 percent of the dropouts from the technical aviation programs were from trained recruits. Thus, there is no evidence that for TB separation after bonus payment is a significant problem.

Recruits Qualified for CB

Almost 8 percent of recruits qualified for CB** were in CB and 41 percent were open enlistments (chapter 8). We again used logit analysis to see which characteristics were related to enlistment in CB. The programs were grouped into four categories: CB, TB, open, and all other.

None of the mental group variables were related to the probability of being in CB. Thus, the recruit in mental group IIIA or mental group IIIB had the same chance of enlistment in CB as did the recruit in mental group I or mental group II. And with respect to education, both those with GEDs and those with high school certificates had the same chance of being in CB as did the high school diploma graduate. These results suggest that the potential of CB to draw in high quality recruits was not being fully utilized.

The evidence indicates that the black recruit had a lower chance of being in CB and a higher chance of having an open enlistment than did the white recruit. Thus, the black recruit was more likely than the white recruit to enter without a guarantee.

With respect to survival of CB qualified recruits through an average of 3 years from date of enlistment, all program categories including CB had positive coefficients. This implies that over a long period of time recruits in CB had a higher chance of surviving than recruits with an open enlistment. The same was true for the CB

* However, all of the independent variables representing the program categories had positive coefficients.
** There were 24,472 recruits qualified for CB.

comparision group made up of the nonbonus combat option and the infantry option.

In addition the rate of separation among those who were trained was about the same between CB and the CB comparison group. The rates were 10 percent and 9.4 percent, respectively.

Recruits in the EBP

Using data obtained from the Marine Corps Finance Center we were able to provide additional information on separation rates from the bonus program (chapter 9). Some of this information is reported in table 42. The evidence indicates that a large proportion of the funds allocated for TB and CB was not used due to dropouts from the delayed entry program and separations from the Marine Corps. TB funds were also underutilized because of failure to receive eligible MOSs. Note also that the proportion of bonus recruits who left the Marine Corps after payment was higher for CB than for TB.

TABLE 42

PROGRAM COMPLETION RATES
FROM USMC FINANCIAL CENTER RECORDS

	Percent of TB recruits[a]	Percent of CB recruits[b]
Delayed entry program dropout	11	10
Paid and survived	61	73
Paid and left USMC	1	4
Not paid		
Left USMC	11	12
Received ineligible MOSs	11	1
Have training MOSs	5	-
	100	100

[a]An average of 2-1/2 years from date of enlistment.
[b]An average of 1-1/2 years from date of enlistment.

An examination of the financial center records also revealed that about 5 percent of TB payments were to recruits with codes other than TB while about 3.2 percent of CB payments were to recruits with codes other

than CB.* We also found that almost 13 percent of those in TB and about 6 percent of those in CB in FY 1980 did not meet the stated qualifications for program entrance. The main criterion lacking for TB recruits was the required EL score. Many CB recruits lacked the appropriate education codes.

RECOMMENDATIONS

Although enlistment bonuses are not as cost effective as either recruiters or advertising (chapter 5), we feel they play an important role with respect to enlistment supply. They have the important advantage that they can be targeted toward particular quality groups and particular skills. Our evidence suggests that the technical skills bonus has been successful in directing blacks and women into technical areas. In addition, the increase in the mental quality requirement for the combat arms bonus, which was included in the FY 1982 program, should make CB more successful in drawing high quality recruits into combat arms.

The bonuses have another important advantage in that they lengthen the contract for some proportion of recruits who would have enlisted anyway. This means additional trained manpower in the fourth year--manpower that may be more productive than that of earlier years.

Because of the ability to target bonuses to particular quality groups and particular skills and because of the contract lengthening effect of the bonuses we recommend that bonuses be continued. We also suggest that the potential of using bonuses to help smooth the time flow of accessions be explored. The increased monetary payments in the FY 1982 program should make this more feasible.

Because many recruits with open enlistments sign 3-year contracts rather than 4-year contracts we also suggest that more recruits be given program guarantees that require 4-year enlistments. This is particularly true for recruits eligible for TB because these are the highest quality recruits in the Marine Corps.

We also recommend that requirements for admission to the EBP be strictly followed and that numerical quotas be set high enough so that all allocated funds are utilized.

* This could reflect either inappropriate payments or inappropriate recording of the program code.

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APPENDIX A

PREVIOUS STUDIES OF ENLISTMENT BONUS PROGRAMS

APPENDIX A

PREVIOUS STUDIES OF ENLISTMENT BONUS PROGRAMS

This appendix provides details of several previous studies concerned with both Army and Marine Corps enlistment bonus programs. The summaries and conclusions reported in chapter 2 are based on these studies. This appendix, similar to chapter 2, is organized around the type of results reported: survey, regression, and cost-effectiveness measures.

SURVEY

Grissmer, 1973

David Grissmer's 1973 study [A-1] used data from a DoD survey given to Army enlistees at the Armed Forces Entrance Examination Stations (AFEES) from June to October 1972. The survey showed 5,067 enlistees who expected to receive a $1,500 combat arms bonus. Grissmer found that on average 17 percent of the enlistees would not have entered the Army if there were no bonus.

Examining data on high school education, Grissmer found the new people attracted by the bonus were equally qualified as the average combat arms enlistee (around 56 percent high school graduates (HSGs)). But the bonus recruits who would have enlisted without a bonus were generally of lower quality (only 47 percent HSGs). Only about 49 percent of all bonus program recruits were HSGs.

Haber and Bennett

In a 1973 study of the $1,500 United States Marine Corps (USMC) combat arms bonus, Haber and Bennett [A-2], report on results of an original questionnaire they designed and administered at the AFEES in 1972. Usable responses were obtained from 1,487 bonus recruits and 11,298 nonbonus recruits (about one-half of enlistments in each category).

The questionnaires indicated that while 95 percent of the bonus recruits would have definitely or probably enlisted in the absence of the draft, 93 percent would have enlisted without the bonus or the draft. This indicates that the bonus was a major consideration in inducing enlistment among only 2 percent of true volunteers. Haber and Bennett also asked the respondents the length of time for which they would have enlisted if there were no bonus. This question was not included in the DoD AFEES surveys. Analyzing the results, the authors calculated a 22 percent increase in man years due to the bonus, among the bonus recruits.

Haber and Bennett also report that most of the bonus recruits did not know about the combat arms bonus before they talked to the Marine Corps recruiter (see table A-1).

TABLE A-1

SOURCE OF RECRUITS' INFORMATION
ABOUT THE ENLISTMENT BONUS

Source	Nonbonus recruits	Bonus recruits
Radio	3.6	4.1
TV	3.6	1.4
Newspaper	4.8	3.9
Magazine	3.3	2.2
Letter	1.8	0.7
Friends or relatives	14.5	12.7
Marine Corps recruiter	36.6	66.5
Army recruiter	1.4	2.4
Another way	4.8	3.7
Cannot remember	3.3	1.0
Not applicable, I never heard about the bonus	22.4	1.5
	100.1%[a]	100.1%[a]

Source: Reference [A-2].
[a]Does not add to 100 percent due to rounding.

Barfoot, Sims, Klein

In 1975, Barfoot, Sims, and Klein [A-3] conducted an extensive study of enlistment guarantees. As part of their study, they included results from a 1974 AFEES survey. Their study included Army and Marine Corps enlistees scheduled to receive the $2,500 combat arms bonus. Their results indicate that 6 percent of the Marines who said they were in the bonus program would not have joined the Marines without the bonus and an additional 14 percent would have joined the Marines but NOT combat arms. The corresponding figures for the Army were 8 percent and 32 percent.

The authors note that because only a small fraction of each service actually gets a bonus the loss to the service of not awarding bonuses is quite small.

Grissmer, 1974

In 1973 the combat arms bonus was increased from $1,500 to $2,500 and the Army limited their bonus payments to high school graduates only. The 1974 Grissmer report [A-4] examined AFEES survey data from June through October 1972 and from July through October 1973. Responses from high school graduate Army and Marine Corps enlistees scheduled to receive bonuses were included.

The 1972 data indicated that 85.9 percent of the Army high school graduate enlistees scheduled to receive the $1,500 bonus would have enlisted in the Army in the absence of the bonus. The figure for USMC high school graduates was higher, 95.4 percent. The sample sizes were 1,167 for the Army and 1,195 for the Marine Corps.

The 1973 survey was worded differently from that given in 1972. This survey asked if the respondent would have joined the same service and taken the same job or joined the same service and taken a different job if he did not enlist for the bonus program. While 82.6 percent of Army high school graduate enlistees would have joined the same service, only 52.8 percent would have taken the same job. The figures for USMC high school graduates were 78.7 percent and 50.8 percent. Comparing the figure of 78.7 percent for the $2,500 bonus to 95.4 percent for the $1,500 bonus indicates that the larger bonus was drawing in more new men to the USMC. That is, the increment in manpower among the bonus recruits for the USMC had increased from 4.6 percent to 21.3 percent. The sample sizes here were 1,664 for the Army and 656 for the USMC.

REGRESSION RESULTS

Grissmer, 1973

Grissmer's 1973 Army study included regression analysis for 1970 through 1972. The goal was to provide an estimate of the increase in volunteer enlistments from mental groups I to III after the bonus was initiated.

The independent variables in the analysis were military pay, bonus, options, recruiting, and Army policy. The Army policy variable reflects the restriction on mental group III non-high school graduates from October 1971 through June 1972. The options variable measures the number and popularity of options available to enlistees while the recruiting variable is the sum of recruiters, unit-of-choice canvassers, and recruiting assistants. Seasonal variables were also entered into the model.

Without recruiter or options variables the effect of the bonus is 673 recruits per month, but with these variables it is zero. On a percentage basis, Grissmer calculates the effect of the bonus as somewhere between 0 and 37 percent incremental manpower from bonus

recruits. That is, somewhere between 63 and 100 percent of bonus recruits would have enlisted even without the bonus. About 15 percent of the enlistees were receiving bonuses, which results in a 0 to 6 percent range for the increase in manpower to the service.

Grissmer, 1974

In this study Grissmer et al., conducted time series analyses of all of the services, varying their models somewhat for each service. For the Marine Corps the variables included were pay, recruiting, bonus, unemployment, and options. Because of high correlation among the variables, separate regressions were run for each variable. Of the services measured, the authors note that the Marine Corps data have the largest unexplained variance and extremely low R^2 values.

The effects of the independent variables are summarized in table A-2. The measurements represent an average of the highest and lowest elasticity values for each variable taken over all regressions that include the variable. The error is derived either from an average of the standard errors or is enlarged to include the span between the highest and lowest estimates.

TABLE A-2

MARINE CORPS REGRESSION RESULTS FOR REFERENCE A-4

	Elasticities		
	Category I-III HS	Category I-IV HS	Category I-III NHS
Military-to-civilian pay ratio	.15 ± .08	.20 ± .15	.76 ± .12
Recruiters	.08 ± .11	0	.98 ± .12
$1,500 bonus	0	0	0
$2,500 bonus	0	0	0
Youth unemployment rate	.29 ± .12	.68 ± .14	0

The data indicate that the effect of the bonus was insignificant in increasing enlistments in any Marine Corps group. However, the coefficients of the other variables are suspect.

A regression analysis was also performed on Army nonprior service volunteer enlistments for CY 1971 to CY 1973. The bonus variables generally either did not enter the regressions or entered with very weak

significance. Depending on the variables in the model, the coefficients on the $1,500 bonus dummy imply effects on high school graduate enlistments in the 0 to 4 percent range while the coefficients on the $2,500 bonus dummy imply effects in the 0 to 8 percent range. The data suggest that the $1,500 bonus was generally less significant than the $2,500 bonus.

Huck, Midlam, 1976

Reference [A-5] also used regression analysis to measure the effect of the Army's combat arms bonus on high school graduate accessions. The uniqueness of their approach is the use of ridge regression. The latter is a technique used when there is high correlation among the independent variables. The time period covered was January 1971 to December 1974. Several categories of accessions were treated as the dependent variable.

The independent variables were those typically used: military-to-civilian pay ratio, unemployment, recruiters, options, and bonus variables.

The authors conclude that the combat arms bonus of $1,500 probably increased overall high school graduate mental group I-III accessions. The authors conclude that the effect of the $1,500 bonus on overall accessions is about 4-1/2 percent. Increasing the bonus to $2,500 had little additional effect--raising 4-year enlistments but lowering 3-year ones.

A time series regression of combat arms accessions did not show any effect. The authors conclude that the additional enlistments in combat arms of higher quality people was at the expense of lower quality people, leaving overall accessions in combat arms constant.

Reference [A-5] includes an assessment of the effect of the noncombat arms enlistment bonus on Army accessions. The Army skills bonus was introduced in June 1974. Ten skills had $2,500 bonuses and 15 skills had $1,500 bonuses.

The authors conclude that in CY 1974 the noncombat arms bonus increased high school graduate accessions to the Army by about 1 percent per month. But the effect on accessions to the skill areas was highly variable. Overall, the increase in total accessions in the $2,500 skills was 26 percent, while accessions in the $1,500 skills decreased by 10 percent. For high school graduates only the figures were 115 percent and 14 percent, respectively (table A-3). The authors question whether it is wise to offer different bonus amounts to different MOSs.

TABLE A-3

EFFECTS OF SKILL BONUSES ON
HIGH SCHOOL GRADUATE ARMY ACCESSIONS

MOS group	Percent increase in accessions	
	$1,500 skills	$2,500 skills
Artillery crewman	1.0	194.5
Artillery and missile maintenance	6.2	104.8
Other maintenance	0.1	310.6
Skills not artillery or missile related	17.6	95.9
All maintenance skills	0.4	169.0
All bonus skills	14.3	115.3

Source: Reference [A-5].

Reference [A-5] also studied loss rates for first term enlistees during the period from January 1971 to March 1975. Reference [A-5] found little difference in loss rates between combat arms enlistees with 3-year rather than 4-year terms. Expected service times were also examined. The data show that the gain in expected service time for combat arms enlistments of 4 instead of 3 years is .35 - .40 years. But, reenlistment rates for 4-year enlistees also appear to be about 30 percent higher than for comparable 3-year enlistees.

COST-EFFECTIVENESS MEASURES

Haber and Bennett, 1973

Based on survey data, [A-2] estimated that the USMC combat arms bonus increased man years by 22.2 percent. They use this incremental man year figure to calculate a cost effectiveness measure for the bonus. The marginal cost per man year of the bonus is calculated as the incremental increase in cost divided by the incremental gain in man years. In calculating this measure, savings in combat arms training were netted out from the cost of the bonus. Savings in variable training cost such as basic training, individual combat training, and field skill training arise because of reduced manpower requirements resulting from longer contracts. The variable training costs were estimated as $834 per recruit in FY 1973. Adjusting bonus payments for these savings, Haber and Bennett estimate the marginal cost per man year as $1,834.

Grissmer, 1974

Using the AFEES survey results discussed earlier, [A-4] also calculated cost-effectiveness measures for the Army's $1,500 and $2,500 bonuses. These figures are recorded in table A-4. The calculations for the Army's $1,500 bonus will be reviewed to illustrate the method used.

TABLE A-4

BONUS COST-EFFECTIVENESS MEASURES FROM AFEES DATA

	Army		Marine Corps	
	$1,500 bonus	$2,500 bonus	$1,500 bonus	$2,500 bonus
Cost per additional high school graduate man year	$ 1,054	$ 1,642	$ 1,982	$1,667
Cost per additional high school graduate	10,600	14,400	32,600	9,500

Of the 5,640 high school graduate bonus recruits in FY 1972, it was assumed from the survey results that 85.9 percent would have enlisted anyway. But, because the average enlistment length was 3 years in the Army these recruits were treated as yielding an extra year of service--4,845 man years (5,640 x .859 x 1 = 4,845 man years). The remainder, 14.1 percent, were classed as new supply each yielding 4 years (3,180 man years). Total new man years were thus 8,025 (4,845 + 3,180 = 8,025). Each of the 5,640 recruits were scheduled to receive $1,500 for a total cost of $8.46 million. Thus, the average cost per new man year was $1,054 ($8.46 million/8,025 = $1,054). The cost per additional high school graduate was $10,600 ($8.46 million/5,640 x .141 = $10,600).

Calculations for the USMC were similar except that with an average length of enlistment of 3.4 years those who would have enlisted in the Marine Corps anyway were treated as yielding only an additional 0.6 man years.

The cost of the $1,500 bonus was quite a bit higher for the USMC than for the Army because so many of the USMC recruits would have enlisted anyway. But table A-4 indicates that because the Marine Corps had a greater response to the bonus increment, the cost per additional high school graduate man year for the $2,500 bonus became lower for the Marine Corps and more similar between the two services.

Huck, Midlam et al.

Reference [A-5] considered two measures of cost-effectiveness with respect to high school graduates in mental groups I to III.

With respect to the $1,500 combat arms bonus, the cost per additional service year for the Army was calculated as $970. This arose from the new men attracted by the bonus and from those who switched from 3-year to 4-year terms.

They estimated that the $2,500 combat arms bonus increased enlistment lengths but did not add new enlistees. The marginal cost per additional service year over and above that generated by the $1,500 bonus was estimated as $18,685. The figure for the nonskill bonus was $845 per additional expected service year for the Army.

In addition to calculations of costs per additional service year, [A-5] also calculated the costs per useful service year. Essentially this measure abstracts away from increased accessions and evaluates the cost of paying a bonus to a 3-year enlistee to commit for an additional year. The cost per useful service year included pay, accession, variable training, and bonus costs. Expected service time was adjusted by subtracting training time. The authors conclude that in one-half of the ten skills paying $2,500 bonuses the high training costs and long training times justify giving the bonus even without increased accessions. This was true for only one of the combat MOSs.

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APPENDIX B

COMPARISON OF 1979 DoD SURVEY RESULTS FOR COMBAT ARMS BONUS ENLISTEES VERSUS TECHNICAL SKILLS BONUS ENLISTEES

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COMPARISON OF 1979 DoD SURVEY RESULTS FOR COMBAT ARMS BONUS ENLISTEES VERSUS TECHNICAL SKILLS BONUS ENLISTEES

ENLISTMENT EFFECTS

To explore whether there are differences in attitudes between combat arms bonus enlistees and technical skills bonus enlistees, it was assumed that those who reported on the DoD survey that they would receive $1,500 were in the TB program while those who reported they would receive $2,500 were in the CB program. This may produce inaccuracies and further reduces the sample size, but does not seem an unreasonable assumption.

Although 240 of the survey respondents said they expected a bonus, the results from both forms show only 61 persons expecting to receive a $1,500 bonus and 121 persons expecting to receive a $2,500 bonus. Table B-1 shows the alternatives these recruits would have chosen if they had not enlisted in the bonus program. The results show just over 70 percent of each group indicating that without the bonuses they would have chosen the same service and the same job. Thus, their decision was not influenced by the bonus. However, the proportion stating they would join the same service and take a different job is higher for those scheduled to receive $1,500 while the proportion stating they would not enlist at all is higher for those scheduled to receive $2,500.

TABLE B-1

RESPONSES OF BONUS GROUPS TO ALTERNATIVES QUESTION

Alternative to bonus enlistment	$1,500 recruits (percent)	$2,500 recruits (percent)
Same service, same job	72.2	71.7
Same service, different job	22.9	18.3
Different service	4.9	2.5
Not enlisted	0.0	7.5
Total	100.0	100.0

The increments in manpower to the service and to the job are 4.9 percent and 27.8 percent for the $1,500 bonus recruits. They are 10.0 percent and 28.3 percent for the $2,500 bonus recruits.

Attitude Questions

Answers to several attitude questions on the DoD survey, such as why the recruit joined the service, were examined to see if the responses differed for those who said they were going to receive a $1,500 bonus and those who said they were going to receive a $2,500 bonus.

As expected, the proportion who said they joined the service "to get trained in a skill that will help me get a civilian job" was higher for the $1,500 bonus recruits. This was expected to be higher because these are presumably the recruits in the TB program. The $2,500 bonus recruits had a higher proportion answering "because I was unemployed and couldn't get a job". The $2,500 bonus recruits also had a higher proportion stating that the first recruiter they talked to was from the Marine Corps.

The answers to several questions from Forms 1 and 2 were combined and are shown in table B-2. The overall responses from chapter 3 are repeated for comparison purposes.

TABLE B-2

RESPONSES TO ATTITUDE QUESTIONS
FOR BONUS GROUPS

	$1,500 bonus	$2,500 bonus	Total
Percent answering they joined service:			
a. to get trained in a skill that will help me get a civilian job	88.5	75.0	86.4
b. because I was unemployed and couldn't get a job	11.5	15.4	15.0
c. because I can earn more money than as a civilian	29.5	27.8	26.1
Percent "very satisfied" with the military job they signed up for	65.0	66.7	50.5
Percent stating that the first recruiter they spoke to was from the Marine Corps	60.0	69.9	63.6
Percent indicating it would be "not difficult at all" or "somewhat difficult" to get a full time job in the area	90.4	87.9	73.2

APPENDIX C

PAY ELASTICITY CALCULATIONS

APPENDIX C

PAY ELASTICITY CALCULATIONS

In this appendix we describe the calculations used to estimate the percentage increase in enlistments attributable to the TB and CB bonuses in FY 1979. (See table 13 in the main text.) The first step was to find the increment to pay which if received over 4 years would have the same discounted present value as the discounted present value of the bonus. We used a 10 percent discount rate and assumed that the combat arms bonus would be received after 6 months while the technical skills bonus would be received after 1 year. The figures are $525 for the technical skills bonus and $916 for the combat arms bonus. These figures were then added into military pay, and the military-to-civilian pay ratio with the bonus included was calculated. The figures for military and civilian pay in FY 1979 are $7,617 and $7,471, respectively. The ratio of these figures is 1.0195. Table C-1 shows this ratio as well as the ratio when the bonus is included. Column 4 shows the resulting percentage increase in the military-to-civilian pay ratio that is attributable to the bonus. To estimate the supply effects for a particular enlistment group we need to know the proportion of that group that typically enlists for the bonus (column 5). In effect, this figure indicates the proportion of a particular group to which the pay increase represented by the bonus applies. When this figure is multiplied by the percentage pay increase we have, in effect, a weighted pay increase. Columns 5 and 6 show these calculations for high school graduates in mental groups I and II. Column 7 shows the percentage increase in enlistments for this group assuming that the pay elasticity is 1. Column 8 shows the results for a pay elasticity of 0.5.

Additional calculations allow us to determine the increase in "new" men per 100 bonuses given. This gives us figures to compare to our survey results. Table C-2 shows our calculations for the $1,500 TB and $2,500 CB assuming the pay elasticity is 1. Again, figures for high school graduates in mental groups I and II are shown. Here column 1 shows the typical number of recruits. When this is multiplied by the estimated percentage increase in enlistments shown in column 2 we get column 3, which is the estimated number of new enlistments. Dividing the estimated number of new enlistments by the number of bonuses and multiplying by 100 gives the number of new enlistments per 100 bonuses given. The figures in column 5 remain the same for other enlistment groups because the estimated percentage increase in enlistments in column 2 have already been weighted to reflect the different group probabilities of receiving the bonus. The figures for new men per 100 would change, however, if the dollar amount of the bonus, the total number of bonuses, or the pay elasticity changed.

TABLE C-2

CALCULATION OF NUMBER OF NEW MEN
PER 100 BONUSES GIVEN[a]

Bonus	(1) Typical number of recruits	(2) Estimated percentage increase in enlistments[b]	(3) Number of new enlistments (1)x(2)	(4) Number of bonuses	(5) Number of new enlistments per 100 bonuses [(3)/(4)]x100
$1,500 TB	10,000	.69	69	1,000	7
$2,500 CB	10,000	.84	84	700	12

[a]Calculations shown are for high school graduates in mental groups I and II.
[b]Assumes pay elasticity equals 1.

APPENDIX D

CORRELATION COEFFICIENTS FOR REGRESSION ANALYSES

APPENDIX D

CORRELATION COEFFICIENTS FOR REGRESSION ANALYSES

This appendix contains the means, standard deviations, and correlation coefficients for our various regression analyses.

TABLE D-1

VARIABLE MEANS AND STANDARD DEVIATIONS FOR TIME SERIES ANALYSIS

VARIABLE	MEAN	STANDARD DEV
DEPENDENT[a]	-8.6056	0.2647
U	2.8301	0.1261
JAN	0.0800	0.2731
FEB	0.0800	0.2731
MARCH	0.0800	0.2731
APRIL	0.0800	0.2731
MAY	0.0800	0.2731
JUNE	0.0800	0.2731
JULY	0.0933	0.2929
AUG	0.0933	0.2929
SEPT	0.0933	0.2929
OCT	0.0800	0.2731
NOV	0.0800	0.2731
MISS	0.0933	0.2929
SPIKE[b]	0.0133	0.1155
GIBILL	0.4400	0.4977
TB COUNT	3.6799	1.1275
BONUS 1	0.1733	0.3811
BONUS 2	0.6800	0.4696

[a]The natural logarithm of HSG mental groups I and II enlistments corrected for relationship with recruiters, youth population, and military-to-civilian pay.
[b]A dummy variable for December 1976, defined as DEC 76 in text.

TABLE D-2

CORRELATION COEFFICIENTS FOR TIME SERIES ANALYSIS

	DEPENDENT	U	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
DEPENDENT	1.00000	0.51998	0.19495	0.14178	0.14248	-0.08903	-0.16053	-0.09487	-0.11437	-0.10906
U	0.51998	1.00000	0.01477	0.03563	0.02786	0.04685	0.01639	0.00489	-0.05532	-0.06017
JAN	0.19495	0.01477	1.00000	-0.08696	-0.08696	-0.08696	-0.08696	-0.08696	-0.09461	-0.09461
FEB	0.14178	0.03563	-0.08696	1.00000	-0.08696	-0.08696	-0.08696	-0.08696	-0.09461	-0.09461
MARCH	0.14248	0.02786	-0.08696	-0.08696	1.00000	-0.08696	-0.08696	-0.08696	-0.09461	-0.09461
APRIL	-0.08903	0.04685	-0.08696	-0.08696	-0.08696	1.00000	-0.08696	-0.08696	-0.09461	-0.09461
MAY	-0.16053	0.01639	-0.08696	-0.08696	-0.08696	-0.08696	1.00000	-0.08696	-0.09461	-0.09461
JUNE	-0.09487	0.00489	-0.08696	-0.08696	-0.08696	-0.08696	-0.08696	1.00000	-0.09461	-0.09461
JULY	-0.11437	-0.05532	-0.09461	-0.09461	-0.09461	-0.09461	-0.09461	-0.09461	1.00000	-0.10294
AUG	-0.10906	-0.06017	-0.09461	-0.09461	-0.09461	-0.09461	-0.09461	-0.09461	-0.10294	1.00000
SEPT	-0.15254	-0.01038	-0.09461	-0.09461	-0.09461	-0.09461	-0.09461	-0.09461	-0.10294	-0.10294
OCT	-0.02017	-0.00389	-0.08696	-0.08696	-0.08696	-0.08696	-0.08696	-0.08696	-0.09461	-0.09461
NOV	0.09666	0.00640	-0.08696	-0.08696	-0.08696	-0.08696	-0.08696	-0.08696	-0.09461	-0.09461
MISS	-0.03815	0.32418	0.07434	0.07434	0.07434	0.07434	0.07434	0.07434	0.05462	-0.10294
SPIKE	0.41440	0.10128	-0.03428	-0.03428	-0.03428	-0.03428	-0.03428	-0.03428	-0.03730	-0.03730
GRADILL	-0.47127	-0.28239	0.03564	0.03564	0.03564	0.03564	0.03564	0.03564	-0.00739	-0.00739
FA COUNT	0.24715	0.41795	0.04862	0.04531	0.04276	-0.04175	-0.02344	0.11539	-0.03370	-0.03086
BONUS 1	0.37715	0.24121	-0.00519	-0.00519	-0.00519	-0.00519	-0.00519	0.12464	-0.02583	-0.02583
BONUS 2	-0.19748	0.26028	-0.00843	-0.00843	-0.00843	-0.00843	-0.00843	-0.00843	0.02358	0.02358

TABLE D-2 (Cont'd)

	SEP	OCT	NOV	MISS	SPIKE	GIBILL	TBCOUNT	BONUS1	BONUS2
DEPENDENT	-0.15254	-0.02017	0.09666	-0.03815	0.41440	-0.47127	0.24715	0.37715	-0.19748
J	-0.01038	-0.00389	0.00640	0.32418	0.10128	-0.28239	0.41795	0.24121	0.26028
JAN	-0.09461	-0.08696	-0.08696	0.07434	-0.03428	0.03564	0.04862	-0.00519	-0.00843
FEB	-0.09461	-0.08696	-0.08696	0.07434	-0.03428	0.03564	0.04531	-0.00519	-0.00843
MAR	-0.09461	-0.08696	-0.08696	0.07434	-0.03428	0.03564	0.04276	-0.00519	-0.00843
APR	-0.09461	-0.08696	-0.08696	0.07434	-0.03428	0.03564	-0.04175	-0.00519	-0.00843
MAY	-0.09461	-0.08696	-0.08696	0.07434	-0.03428	0.03564	-0.02344	-0.00519	-0.00843
JUN	-0.09461	-0.08696	-0.08696	0.07434	-0.03428	0.03564	0.11539	0.12464	-0.00843
JUL	-0.10294	-0.09461	-0.09461	0.05462	-0.03730	-0.00739	-0.03370	-0.02583	0.02358
AUG	-0.10294	-0.09461	-0.09461	-0.10294	-0.03730	-0.00739	-0.03086	-0.02583	0.02358
SEP	1.00000	-0.09461	-0.09461	-0.10294	-0.03730	-0.00739	-0.07628	-0.02583	0.02358
OCT	-0.09461	1.00000	-0.08696	-0.09461	-0.03428	-0.06337	-0.07670	-0.00519	-0.00843
NOV	-0.09461	-0.08696	1.00000	-0.09461	-0.03428	-0.06337	-0.02606	-0.00519	-0.00843
MISS	-0.10294	-0.09461	-0.09461	1.00000	-0.03730	-0.28440	-0.03152	-0.14692	0.22010
SPIKE	-0.03730	-0.03428	-0.03428	-0.03730	1.00000	-0.10304	0.15647	-0.05323	0.07975
GIBILL	-0.00739	-0.06337	-0.06337	-0.28440	-0.10304	1.00000	0.40661	-0.40589	0.60807
TB COUNT	-0.07628	-0.07670	-0.02606	-0.03152	0.15647	0.40661	1.00000	0.17448	0.49392
BONUS 1	-0.02583	-0.00519	-0.00519	-0.14692	-0.05323	-0.40589	0.17448	1.00000	-0.66751
BONUS 2	0.02358	-0.00843	-0.00843	0.22010	0.07975	0.60807	0.49392	-0.66751	1.00000

TABLE D-3

VARIABLE MEANS AND STANDARD DEVIATIONS FOR
PROGRAM ALLOCATION ANALYSIS
"TB QUALIFIED" RECRUITS, FY 1980

Variable	Mean	Standard deviation
PROGRAM	2.78	1.07
MGIIA	.28	.45
MGIIB	.42	.49
MGIIIA	.07	.26
AGE	18.85	2.10
DELAYED ENTRY TIME	105.06	106.39
BLACK	.03	.17
HISPANIC	.03	.16
FEMALE	.05	.21
MARRIED	.05	.21
COLLEGE	.02	.14
CERTIFICATE	.03	.17
POST HIGH SCHOOL	.09	.30

TABLE D-4

CORRELATION COEFFICIENTS FOR PROGRAM ALLOCATION ANALYSIS
"TB QUALIFIED" RECRUITS, FY 1980

	PROGRAM	MGIIA	MGIIB	MGIIIA	AGE	DELAYED ENTRY TIME	BLACK	HISPANIC	FEMALE	MARRIED	COLLEGE	CERTIFICATE	POST HIGH SCHOOL
PROGRAM	1.0												
MGIIA	-.01	1.0											
MGIIB	-.00	-.53	1.0										
MGIIIA	.02	-.17	-.23	1.0									
AGE	.16	.02	-.11	-.06	1.0								
DELAYED ENTRY TIME	-.17	-.00	.08	.03	-.48	1.0							
BLACK	-.01	-.00	.03	.03	.06	-.04	1.0						
HISPANIC	.03	.02	.01	.01	.01	.01	-.03	1.0					
FEMALE	-.04	.02	-.07	-.03	.08	-.02	.02	-.02	1.0				
MARRIED	.02	-.00	-.03	.03	.30	-.12	-.00	-.00	.07	1.0			
COLLEGE	.03	-.00	-.03	-.02	.26	-.07	.03	.15	.08	.10	1.0		
CERTIFICATE	.03	-.04	.03	-.00	-.04	.01	.02	.03	-.04	-.02	-.03	1.0	
POST HIGH SCHOOL	.06	-.00	-.08	-.04	.34	-.17	.03	.03	.04	.05	-.05	-.06	1.0

TABLE D-5

VARIABLE MEANS AND STANDARD DEVIATIONS
FOR SURVIVAL ANALYSIS
"TB QUALIFIED" RECRUITS, FY 1978

VARIABLE	MEAN	STANDARD DEVIATION
MGIIA	.28	.45
MGIIB	.41	.49
MGIIIA	.08	.27
AGE	18.61	1.97
DELAYED ENTRY TIME	114.53	100.82
BLACK	.04	.19
HISPANIC	.03	.17
FEMALE	.06	.23
MARRIED	.05	.22
COLLEGE	.02	.15
CERTIFICATE	.004	.06
POST HIGH SCHOOL	.09	.30
TB	.15	.36
CB	.07	.25
AVIATION/TECH	.23	.42
AVIATION/SUPP	.08	.28
MECH/ELEC	.11	.31
ALL OTHER	.15	.36
ENLISTMENT LENGTH	.86	.35
SURVIVAL	.82	.38
BOOT CAMP GRAD	.91	.28

TABLE D-6

CORRELATION COEFFICIENTS FOR SURVIVAL ANALYSIS
"TB QUALIFIED" RECRUITS, FY 1978

	MGIIA	MGIIB	MGIIIA	AGE	DELAYED ENTRY TIME	BLACK	HISPANIC	FEMALE
Mental Group								
MGIIA	1.0							
MGIIB	-.52	1.00						
MGIIIA	-.18	-.24	1.00					
AGE	.01	-.11	-.08	1.00				
DELAYED ENTRY TIME	-.15	.06	.08	-.47	1.00			
RACE/ETHNIC								
BLACK	-.00	.05	.01	.13	-.08	1.00		
HISPANIC	.01	-.00	.01	.04	-.01	-.03	1.00	
FEMALE	.04	-.05	-.04	.13	-.08	.02	-.01	1.00
MARRIED	-.01	-.03	-.02	.32	-.12	.01	.00	.06
EDUCATION								
COLLEGE	-.03	-.01	-.02	.31	-.08	.03	.01	.09
CERTIFICATE	-.02	-.00	-.00	-.01	-.02	-.12	-.01	-.01
POST HIGH SCHOOL	.01	-.09	-.03	.40	-.19	.06	.04	.05
PROGRAMS								
TB	-.00	-.01	.01	-.10	.16	.13	-.00	-.02
CB	-.01	-.03	-.00	-.02	.05	-.04	-.04	-.07
AVIATION/ TECH	.01	-.02	-.02	.02	-.03	.05	.01	-.01
AVIATION/ SUPPORT	-.01	.04	.03	-.06	.09	-.01	.02	-.05
MECH/ELEC	-.01	.02	-.00	-.07	.06	-.02	-.02	.00
ALL OTHER	.00	.01	.02	.05	-.08	-.03	-.01	.04
ENLISTMENT LENGTH	-.01	.00	-.01	-.09	.14	.02	.00	-.03
SURVIVAL	-.00	.02	.02	-.13	.14	-.04	.02	-.19
BOOT CAMP GRAD	-.00	-.01	.02	-.10	.08	-.02	.01	-.07

TABLE D-6 (Cont'd)

	MARRIED	COLLEGE	CERTIFICATE	POST HIGH SCHOOL	TB	CB	AVIATION/ TECH	AVIATION/ SUPPORT	MECH/ELEC	ALL OTHER	ENLIST-MENT LENGTH	SURVIVAL	BOOT CAMP GRAD
MARRIED	1.00												
EDUCATION													
COLLEGE	.08	1.00											
CERTIFICATE	.00	-.01	1.00										
POST HIGH SCHOOL	.12	-.05	-.02	1.00									
PROGRAMS													
TB	-.02-	-.03	-.03	-.06	1.00								
CB	-.01	.00	-.00	-.00	-.11	1.00							
AVIATION/ TECH	-.01	.00	-.00	.03	-.23	-.14	1.00						
AVIATION/ SUPPORT	-.02	.00	.01	-.05	-.13	-.08	-.16	1.00					
MECH/ELEC	-.02	-.05	.00	-.05	-.15	-.09	-.18	-.11	1.00				
ALL OTHER	.02	.05	-.01	.04	-.18	-.11	-.22	-.13	-.14	1.00			
ENLISTMENT LENGTH	.00	-.02	-.00	-.06	.17	.11	.22	.12	.06	-.29	1.00		
SURVIVAL	-.04	-.00	-.01	-.03	.02	.03	.02	.04	.02	-.01	.03	1.00	
BOOT CAMP GRAD	-.03	-.02	.01	-.00	.02	.02	.02	-.00	.01	-.00	.05	.58	1.00

TABLE D-7

VARIABLE MEANS AND STANDARD DEVIATIONS
FOR PROGRAM ALLOCATION ANALYSIS
"CB QUALIFIED" RECRUITS, FY 1980

VARIABLE	MEAN	STANDARD DEVIATION
PROGRAM	3.22	.85
AGE	18.61	1.77
DELAYED ENTRY TIME	110.32	112.31
MGIIA	.07	.26
MGIIB	.21	.41
MGIIIA	.32	.47
MGIIIB	.34	.47
COLLEGE	.01	.09
BLACK	.19	.39
HISPANIC	.07	.26
MARRIED	.44	.20
CERTIFICATE	.05	.22
POST HIGH SCHOOL	.04	.20
GED	.05	.22

TABLE D-8

CORRELATION COEFFICIENTS FOR PROGRAM [illegible] ION ANALYSIS "CB QUALIFIED" RECRUITS, FY 1980

	AGE	DELAYED ENTRY TIME	MGIIA	MGIIB	MGIIIA	COLLEGE	MGIIIB	BLACK	HISPANIC	MARRIED	CERTIFICATE	POST HIGH SCHOOL	GED	PROGRAM
AGE	1.00													
DELAYED ENTRY TIME	-.47	1.00												
MGIIA	.06	-.03	1.00											
MGIIB	.03	-.03	-.14	1.00										
MGIIIA	-.06	.04	-.19	-.36	1.00									
COLLEGE	.21	-.04	.04	.01	-.03	1.00								
MGIIIB	-.04	.03	-.20	-.38	-.50	-.03	1.00							
BLACK	.01	.00	-.11	-.17	-.05	.03	.30	1.00						
HISPANIC	.03	-.01	-.06	-.07	.01	.01	.09	-.13	1.00					
MARRIED	.24	-.09	.01	.00	.02	.03	-.02	-.03	.03	1.00				
CERTIFICATE	-.04	.03	-.05	-.03	.01	-.02	.05	.03	.01	-.03	1.00			
POST HIGH SCHOOL	.25	-.09	.07	-.00	-.02	-.02	-.07	.00	.06	.04	-.05	1.00		
GED	.04	-.16	-.00	.01	.02	-.02	-.01	-.03	-.00	.03	-.05	-.05	1.00	
PROGRAM	.12	-.22	-.07	-.05	.00	.00	.10	.09	.03	.02	.06	-.02	.10	1.00

TABLE D-9

VARIABLE MEANS AND STANDARD DEVIATIONS
FOR SURVIVAL ANALYSIS "CB QUALIFIED RECRUITS, FY 1978

VARIABLE	MEAN	STANDARD DEV
BOOT CAMP GRAD	0.8876	0.3156
MG IIA	0.0687	0.2530
MG IIB	0.2132	0.4095
MG IIIA	0.3255	0.4686
MG IIIB	0.3464	0.4758
AGE	18.5114	1.8409
DELAYED ENTRY TIME	09.3776	102.5607
BLACK	0.2228	0.4162
HISPANIC	0.0825	0.2751
MARRIED	0.0435	0.2039
GED	0.0480	0.2138
CERTIFICATE	0.0125	0.1111
POST HIGH SCHOOL	0.0403	0.1967
TB	0.0344	0.1824
CV	0.0805	0.2721
AVIATION/TECH	0.0661	0.2485
MECH/ELEC	0.1146	0.3185
ALL OTHER	0.1283	0.3344
ENLISTMENT LENGTH	0.7585	0.4280
AVIATION/SUPP	0.1139	0.3177
NOTSEPE	0.7649	0.4241
COLLEGE	0.0069	0.0827
CBCOMPARISON	0.0614	0.2402

TABLE D-10

CORRELATION COEFFICIENTS FOR SURVIVAL ANALYSIS "CB QUALIFIED" RECRUITS, FY 1978

	BOOTCAMP GRAD	MG IIA	MG IIB	MG IIIA	MG IIIB	AGE	DELAYED ENTRY TIME	BLACK	HISPANIC	MARRIED
BOOT CAMP GRAD	1.00000	0.02149	0.03012	0.01148	-0.05712	-0.14186	0.09825	-0.03236	0.01450	-0.05042
MG IIA	0.02149	1.00000	-0.14139	-0.10870	-0.19778	0.01840	-0.00328	-0.11718	-0.04415	0.01547
MG IIB	0.03012	-0.14139	1.00000	-0.36157	-0.37897	-0.01308	0.00725	-0.16269	-0.04996	0.01025
MG IIIA	0.01148	-0.10870	-0.36157	1.00000	-0.50576	-0.03932	0.03198	-0.03370	0.01052	-0.00607
MG IIIB	-0.05712	-0.19778	-0.37897	-0.50576	1.00000	0.00963	-0.02396	0.28124	0.07448	-0.02151
AGE	-0.14186	0.01840	-0.01308	-0.03932	0.00963	1.00000	-0.41670	0.10947	0.04689	0.24000
DELAYED ENTRY TIME	0.09825	-0.00328	0.00725	0.03198	-0.02396	-0.41670	1.00000	-0.07988	-0.02296	-0.00806
BLACK	-0.03236	-0.11718	-0.16269	-0.03370	0.28124	0.10947	-0.07988	1.00000	-0.16052	-0.03495
HISPANIC	0.01450	-0.04415	-0.04996	0.01052	0.07448	0.04689	-0.02296	-0.16052	1.00000	0.03998
MARRIED	-0.05042	0.01547	0.01025	-0.00607	-0.02151	0.24000	-0.00806	-0.03495	0.03998	1.00000
GED	-0.06808	-0.00262	0.01619	0.03971	-0.04604	0.01173	-0.11448	-0.05715	0.01874	0.05556
CERTIFICATE	0.00727	-0.02149	-0.01465	0.00352	0.02585	-0.01525	-0.01793	0.00321	0.02618	0.00605
POST HIGH SCHOOL	-0.00248	0.06739	0.02054	-0.04040	-0.06653	0.27613	-0.11073	0.02170	0.02266	0.06659
TB	0.02504	0.14042	0.09470	-0.06243	-0.13555	-0.04475	0.07317	-0.07704	-0.03543	-0.00401
CM	0.00572	-0.00751	-0.01669	-0.00149	0.01735	-0.05048	0.09384	-0.03456	-0.01771	-0.01948
AVIATION/TECH	0.02792	0.14215	0.13935	-0.08112	-0.18187	-0.00077	-0.02198	-0.09766	-0.04120	0.00287
MECH/ELEC	0.02641	-0.01171	-0.00734	0.01135	0.00767	-0.06718	0.08468	-0.06529	-0.00741	-0.01776
ALL OTHER	-0.00219	-0.02128	-0.01029	0.03122	0.00288	0.02276	0.01035	0.03292	0.00334	-0.00506
ENLISTMENT LENGTH	0.02949	0.05587	0.06104	0.00398	-0.10848	-0.04930	0.17146	-0.06961	-0.01147	-0.00350
AVIATION/SUPP	0.03670	-0.01642	0.06051	0.11501	-0.14341	-0.07408	0.14216	-0.08162	0.00739	-0.00616
NOTSEP	0.59020	0.03001	0.05104	0.00177	-0.07879	-0.13999	0.14421	-0.08680	0.03420	-0.04119
COLLEGE	-0.02414	0.01192	0.02569	-0.01945	-0.03363	0.19777	-0.04312	0.01470	-0.00461	0.06941
CBCOMPARISION	0.00794	-0.00021	0.01858	0.01273	-0.02367	-0.16116	-0.06173	-0.08425	-0.03421	-0.00938

TABLE D-10 (Cont'd)

	GED	CERTIFICATE	POST HIGH SCHOOL	TB	CB	AVIATION TECH	MECH/ELEC	ALL OTHER
ROOT CAPP GRAD	-0.06888	0.00727	-0.00248	0.02504	0.00572	0.02792	0.02641	-0.00219
MG IIA	-0.00702	-0.02145	0.06739	0.14042	-0.60751	0.14215	-0.01171	-0.02179
MG IIB	0.01619	-0.01465	0.02054	0.09470	-0.01669	0.13935	-0.00734	-0.01029
MG IIIA	0.03971	0.00352	-0.04040	-0.00243	-0.00149	-0.00112	0.01135	0.03122
MG IIIB	-0.04604	0.02585	-0.06653	-0.13555	0.01735	-0.18167	0.00767	0.00288
AGE	0.01173	-0.01525	0.27613	-0.04475	-0.05048	-0.00077	-0.06718	0.02176
DELAYED ENTRY TIME	-0.11448	-0.01793	-0.11073	0.07317	0.09384	-0.02190	0.08469	0.01005
BLACK	-0.05715	0.00321	0.02170	-0.07704	-0.03456	-0.09766	-0.06529	0.03292
HISPANIC	0.01874	0.02618	0.02266	-0.03543	-0.01771	-0.04120	-0.00981	0.00334
MARRIED	0.05554	0.00605	0.06659	-0.00481	-0.01940	0.00287	-0.01776	-0.00506
GED	1.00000	-0.02527	-0.04603	-0.03914	-0.02992	-0.02214	-0.04770	-0.04511
CERTIFICATE	-0.02527	1.00000	-0.02306	-0.02125	-0.02064	-0.00992	-0.01645	-0.00540
POST HIGH SCHOOL	-0.04603	-0.02306	1.00000	0.01227	-0.01696	0.05508	-0.03573	0.04356
TB	-0.03914	-0.02125	0.01227	1.00000	-0.05590	-0.05026	-0.06795	-0.07246
CB	-0.02992	-0.02064	-0.01696	-0.05590	1.00000	-0.07076	-0.10648	-0.11354
AVIATION/TECH	-0.02214	-0.00992	0.05508	-0.05026	-0.07076	1.00000	-0.09573	-0.10200
MECH/ELEC	-0.04770	-0.01645	-0.03573	-0.06795	-0.10648	-0.09573	1.00000	-0.13002
ALL OTHER	-0.04511	-0.00540	0.04356	-0.07246	-0.11354	-0.10200	-0.13002	1.00000
ENLISTMENT LENGTH	-0.04385	-0.03130	-0.02781	0.10657	0.16444	0.14935	0.12315	-0.04231
AVIATION/SUPP	0.00904	-0.01986	-0.02719	-0.06771	-0.10610	-0.09539	-0.12098	-0.13753
NOTSEP	-0.09269	-0.01253	-0.00212	0.03597	0.00930	0.04501	0.04739	0.00125
COLLEGE	-0.01070	-0.00937	-0.01707	-0.00445	0.00100	0.02128	-0.02028	0.02490
CBCOMPARISION	0.00963	-0.00489	0.00607	-0.04833	-0.07573	-0.06809	-0.09206	-0.09316

TABLE D-10 (Cont'd)

	ENLISTMENT LENGTH	AVIATION SUPPORT	NOTSEP	COLLEGE	CBCOMPARISION
BOOT CAMP GRAD	0.02949	0.03670	0.59028	-0.02414	0.00794
MG IIA	0.05587	-0.01642	0.03881	0.01192	-0.00021
MG IIB	0.06104	0.04051	0.05104	0.02569	0.01858
MG IIIA	0.00390	0.11501	0.00177	-0.01945	0.01273
MG IIIB	-0.10848	-0.14341	-0.07879	-0.03363	-0.02367
AGE	-0.08930	-0.07400	-0.13999	0.19777	-0.00116
DELAYED ENTRY TIME	0.17146	0.14216	0.14411	-0.04310	-0.06179
BLACK	-0.06961	-0.08162	-0.08680	0.01470	-0.08425
HISPANIC	-0.01167	0.00739	0.03420	-0.00441	-0.03421
MARRIED	-0.00350	-0.00616	-0.04119	0.06041	-0.00938
GED	-0.04385	0.00904	-0.09269	-0.01870	0.00963
CERTIFICATE	-0.03130	-0.01986	-0.01253	-0.00937	-0.08489
POST HIGH SCHOOL	-0.02781	-0.02719	-0.00212	-0.01707	0.00607
T9	0.19657	-0.06771	0.03597	-0.00445	-0.04833
C9	0.16444	-0.10610	0.00930	0.00180	-0.07573
AVIATION/TECH	0.14935	-0.09539	0.04501	0.02128	-0.06809
MECH/ELEC	0.12315	-0.12898	0.04739	-0.02028	-0.09206
ALL OTHER	-0.04231	-0.13753	0.00126	0.02800	-0.09816
ENLISTMENT LENGTH	1.00000	0.20009	0.06452	-0.01066	-0.17006
AVIATION/SUPP	0.20009	1.00000	0.06284	-0.00720	-0.09173
NOTSEP	0.06452	0.06204	1.00000	-0.00596	0.00112
COLLEGE	-0.01066	-0.00720	-0.00596	1.00000	0.00224
CBCOMPARISION	-0.17006	-0.09173	0.00112	0.00224	1.00000

TABLE D-11

VARIABLE MEANS AND STANDARD DEVIATIONS
FOR SURVIVAL ANALYSIS FOR
RECRUITS IN TB, FY 1978

VARIABLE	MEAN	STANDARD DEV
BOOT CAMP GRAD	0.9309	0.2538
NOTSEP	0.8224	0.3824
MG IIA	0.2598	0.4388
MG IIB	0.4195	0.4938
MG IIIA	0.1144	0.3185
MG IIIB	0.0048	0.0689
MG IV	0.0000	0.0000
BLACK	0.0572	0.2324
HISPANIC	0.0298	0.1701
NUMBERDEP	0.0393	0.1945
MARRIED	0.0405	0.1973
FEMALE	0.0536	0.2254
CERTIFICATE	0.0000	0.0000
COLLEGE	0.0072	0.0843
POST HIGH SCHOOL	0.0584	0.2346
OTHER EDUCATION	0.0131	0.1138
AGE	18.1275	1.5903
DELAYED ENTRY TIME	148.2098	102.5394

TABLE D-12

CORRELATION COEFFICIENTS FOR SURVIVAL ANALYSIS
FOR RECRUITS IN TB, FY 1978

	BOOT CAMP GRAD	NOTSEP	MG IIA	MG IIB	MG IIIA	MG IIIB	MG IV
BOOT CAMP GRAD	1.00000	0.54955	0.00075	-0.02539	-0.02013	0.01886	99.00000
NOTSEP	0.54955	1.00000	0.02642	-0.01572	0.02007	-0.01311	99.00000
MG IIA	0.00075	0.02642	1.00000	-0.50372	-0.21297	-0.04101	99.00000
MG IIB	-0.02539	-0.01572	-0.50372	1.00000	-0.30560	-0.05884	99.00000
MG IIIA	-0.02013	0.02007	-0.21297	-0.30560	1.00000	-0.02488	99.00000
MG IIIB	0.01886	-0.01311	-0.04101	-0.05884	-0.02488	1.00000	99.00000
MG IV	99.00000	99.00000	99.00000	99.00000	99.00000	99.00000	1.00000
BLACK	0.04690	-0.04667	-0.07574	0.07136	0.07267	0.13196	99.00000
HISPANIC	0.02012	0.00807	-0.07186	0.03567	-0.01895	-0.01213	99.00000
NUMBERDEP	0.00680	0.02985	-0.02201	-0.06020	0.00432	-0.01400	99.00000
MARRIED	0.00835	0.00060	-0.03907	-0.05224	-0.01691	-0.01422	99.00000
FEMALE	0.00231	-0.15239	-0.00835	0.01201	-0.06895	-0.01648	99.00000
COLLEGE	0.02313	-0.03459	-0.05028	-0.01483	-0.03051	-0.00587	99.00000
POST HIGH SCHOOL	0.02780	-0.04386	0.02629	-0.06754	-0.04162	-0.01724	99.00000
OTHER EDUCATION	-0.00990	-0.00127	0.02728	-0.03429	-0.00851	-0.00798	99.00000
AGE	-0.03430	-0.15109	-0.02531	-0.07582	-0.04298	-0.00555	99.00000
DELAYED ENTRY TIME	0.02921	0.13793	0.06750	-0.03839	0.07084	-0.03695	99.00000

TABLE D-12 (Cont'd)

	BLACK	HISPANIC	NUMBER DEP.	MARRIED	FEMALE	COLLEGE	POST HIGH SCHOOL	OTHER EDUCATION	AGE	DELAYED ENTRY TIME
BOOT CAMP GRAD	0.04630	0.02012	0.00680	0.00835	0.00231	0.02313	0.02780	-0.00990	-0.03430	0.02921
NUTSEP	-0.04667	0.00807	0.02985	0.00060	-0.15239	-0.03459	-0.04386	-0.00127	-0.15109	0.13793
MG IIA	-0.07574	-0.07186	-0.02201	-0.03907	-0.00835	-0.05028	0.02629	0.02728	-0.02531	0.06750
MG IIB	0.07136	0.03567	-0.06020	-0.05224	0.01201	-0.01483	-0.06754	-0.03429	-0.07582	-0.03839
MG IIIA	0.07267	-0.03895	0.00432	-0.01691	-0.06895	-0.03051	-0.04162	-0.00951	-0.04298	0.07084
MG IIIB	0.13196	-0.01213	-0.01400	-0.01422	-0.01668	-0.00567	-0.01724	-0.00798	-0.00555	-0.03695
MG IV	99.00000	99.00000	99.00000	99.00000	99.00000	99.00000	99.00000	99.00000	99.00000	99.00000
BLACK	1.00000	-0.04317	0.02936	0.00143	0.05525	-0.02091	0.06996	-0.02839	0.20626	-0.15199
HISPANIC	-0.04317	1.00000	-0.03546	-0.03602	-0.01061	-0.01487	0.01614	-0.02020	-0.03612	-0.01178
NUMBERDEP	0.02936	-0.03546	1.00000	0.82909	0.03348	-0.01717	0.13264	0.03058	0.31169	-0.10548
MARRIED	0.00143	-0.03602	0.82909	1.00000	0.08522	0.05429	0.12925	0.02945	0.33340	-0.12216
FEMALE	0.05525	-0.01061	0.03348	0.08522	1.00000	0.10536	0.09863	0.01907	0.20059	-0.10152
COLLEGE	-0.02091	-0.01487	-0.01717	0.05429	0.10536	1.00000	-0.02114	-0.00978	0.20679	-0.08658
POST HIGH SCHOOL	0.06996	0.01614	0.13264	0.12925	0.09863	-0.02114	1.00000	-0.02871	0.38295	-0.19419
OTHER EDUCATION	-0.02839	-0.02020	0.03058	0.02945	0.01907	-0.00978	-0.02871	1.00000	-0.02903	-0.01046
AGE	0.20626	-0.03612	0.31169	0.33340	0.20059	0.20679	0.38295	-0.02903	1.00000	-0.48930
DELAYED ENTRY TIME	-0.15199	-0.01178	-0.10548	-0.12216	-0.10152	-0.08658	-0.19419	-0.01046	-0.48930	1.00000

TABLE D-13

VARIABLE MEANS AND STANDARD DEVIATIONS
FOR SURVIVAL ANALYSIS FOR
RECRUITS IN CB, FY 1978

VARIABLE	MEAN	STANDARD DEV
BOOT CAMP GRAD	0.8953	0.3063
NOTSEP	0.7724	0.4194
MG IIA	0.0590	0.2357
MG IIB	0.1829	0.3867
MG IIIA	0.3088	0.4621
MG IIIB	0.4012	0.4903
MG IV	0.0005	0.0222
BLACK	0.1883	0.3910
HISPANIC	0.0708	0.2565
NUMBERDEP	0.0270	0.1622
MARRIED	0.0305	0.1720
CERTIFICATE	0.0265	0.1608
COLLEGE	0.0049	0.0700
POST HIGH SCHOOL	0.0275	0.1637
OTHER EDUCATION	0.0256	0.1579
AGE	18.1770	2.0489
DELAYED ENTRY TIME	143.5703	94.0835

TABLE D-14

CORRELATION COEFFICIENTS FOR SURVIVAL
ANALYSIS FOR RECRUITS IN CB, FY 1978

	Boot Camp Grad	NOTSEP	MG IIA	MG IIB	MG IIIA	MG IIIB	MG IV	BLACK	HISPANIC
BOOT CAMP GRAD	1.00000	0.57638	0.00386	0.02889	-0.03905	-0.00507	0.00759	0.00866	-0.02454
NOTSEP	0.57638	1.00000	0.00157	0.04755	-0.02550	-0.03888	0.01204	-0.07443	-0.00101
MG IIA	0.00386	0.00157	1.00000	-0.11846	-0.16734	-0.20495	-0.00555	-0.11526	-0.06098
MG IIB	0.02889	0.04755	-0.11846	1.00000	-0.31619	-0.38724	-0.01049	-0.14654	-0.06117
MG IIIA	-0.03905	-0.02550	-0.16734	-0.31619	1.00000	-0.54703	-0.01482	-0.07963	-0.04340
MG IIIB	-0.00507	-0.03888	-0.20495	-0.38724	-0.54703	1.00000	-0.01815	0.29339	0.13778
MG IV	0.00759	0.01204	-0.00555	-0.01049	-0.01482	-0.01815	1.00000	-0.01068	-0.00612
BLACK	0.00866	-0.07443	-0.11526	-0.14654	-0.07963	0.29339	-0.01068	1.00000	-0.13295
HISPANIC	-0.02454	-0.00101	-0.06098	-0.06117	-0.04340	0.13778	-0.00612	-0.13295	1.00000
NUMBERDEP	-0.04198	-0.02516	-0.00315	-0.00850	0.01981	-0.01277	-0.00370	0.02825	0.00125
MARRIED	-0.07012	-0.04015	0.00415	0.00489	0.00531	-0.01676	-0.00393	-0.01956	-0.00434
GED	-0.01344	-0.03434	-0.00241	0.02471	0.02203	-0.03534	-0.00366	-0.03261	0.03788
CERTIFICATE	0.00108	-0.02890	0.01223	0.02129	-0.01655	-0.00017	-0.00156	-0.01588	0.06281
POST HIGH SCHOOL	-0.00133	0.01969	0.12365	-0.00965	-0.03441	-0.07642	-0.00373	-0.01187	-0.01130
OTHER EDUCATION	-0.00564	-0.01607	-0.01412	-0.02023	-0.00037	0.02630	-0.00359	0.03353	0.06459
AGE	-0.09900	-0.09276	0.03948	-0.02722	-0.04216	0.01497	-0.01274	0.05723	0.03698
DELAYED ENTRY TIME	0.10347	0.13177	-0.03748	0.00607	0.02763	0.01054	0.03005	-0.00571	-0.00575

TABLE D-14 (Cont'd)

	NUMBER DEF	MARRIED	GED	CERT	POST HIGH SCHOOL	OTED	AGE	DELAYED ENTRY
BOOT CAMP GRAD	-0.04198	-0.07012	-0.01344	0.00108	-0.00133	-0.00564	-0.09900	0.10347
NOTSCP	-0.02516	-0.04015	-0.03434	-0.02890	0.01969	-0.01607	-0.09276	0.13177
MG IIA	-0.00315	0.00415	-0.00241	0.01223	0.12365	-0.01412	0.03948	-0.03748
MG IIB	-0.00830	0.00489	0.02471	0.02129	-0.00965	-0.02023	-0.02722	0.00607
MG IIIA	0.01981	0.00531	0.02203	-0.01655	-0.03441	-0.00037	-0.04216	0.02763
MG IIIB	-0.01277	-0.01676	-0.03534	-0.00017	-0.07642	0.02630	0.01497	0.01054
MG IV	-0.00370	-0.00393	-0.00366	-0.00196	-0.00373	-0.00359	-0.01274	0.03905
BLACK	0.02825	-0.01956	-0.03261	-0.01588	-0.01187	0.03353	0.05723	-0.00571
HISPANIC	0.00125	-0.00434	0.03788	0.06261	-0.01130	0.06459	0.03698	-0.00575
NUMBERDEP	1.00000	0.83440	0.04789	-0.01172	0.06457	-0.00780	0.17500	-0.06859
MARRIED	0.83440	1.00000	0.07746	-0.01246	0.09251	-0.01060	0.21226	-0.08885
GED	0.04789	0.07746	1.00000	-0.01161	-0.02779	-0.02675	0.00514	-0.10101
CERTIFICATE	-0.01172	-0.01246	-0.01161	1.00000	-0.01183	-0.01139	-0.01980	-0.00050
POST HIGH SCHOOL	0.06457	0.09251	-0.02779	-0.01183	1.00000	-0.02725	0.24509	-0.12324
OTHER EDUCATION	-0.00780	-0.01060	-0.02675	-0.01139	-0.02725	1.00000	-0.03376	0.00634
AGE	0.17500	0.21226	0.00514	-0.01980	0.24509	-0.03376	1.00000	-0.32626
DELAYED ENTRY TIME	-0.06859	-0.08885	-0.10101	-0.00050	-0.12324	0.00634	-0.32626	1.00000

APPENDIX E

REGRESSION RESULTS FOR THE COMBAT ARMS BONUS

APPENDIX E

REGRESSION RESULTS FOR THE COMBAT ARMS BONUS

The number of combat arms bonus contracts signed in each month, CB COUNT, was entered as an independent variable in models to explain enlistments among high school graduates in mental groups I and II and in mental groups I to IIIA. The results are shown in table E-1.

TABLE E-1

REGRESSION RESULTS USING CB COUNT VARIABLE

Variable	HSG mental groups I and II	HSG mental groups I to IIIA
Unemployment	.76[a]	.72[a]
GI Bill	-.30[a]	-.26[a]
DEC 76	.62[a]	.60[a]
MISS	-.30[a]	-.24[a]
CB COUNT	.04[b]	.05[a]

[a]Significant at the 5 percent level.
[b]Significant at the 10 percent level.

The coefficients although significant give results that are implausible.

The results indicate that 100 new combat arms bonus contracts would result in 62 new HSG mental groups I and II enlistments and 77 new HSG mental groups I to IIIA enlistments. (The method used to calculate these numbers is similar to that described in appendix C.) The problem is that typically of 100 new combat arms bonus contracts signed, one-third would go to recruits in mental groups I and II, one-third to recruits in mental group IIIA, and one-third to recruits in mental group IIIB. This implies that of 100 new contracts only 33 would be received by recruits in mental groups I and II. But the regression results imply 62 new mental groups I and II contracts.

APPENDIX F

COST-EFFECTIVENESS CALCULATIONS

APPENDIX F

COST-EFFECTIVENESS CALCULATIONS

Cost-effectiveness figures were calculated for both a $3,000 technical skills bonus and a $3,000 combat arms bonus. The calculations were made assuming the respective bonus generated 5, 10, or 20 "new" men out of 100 bonuses given. In each case we included an estimate of the percentage of recruits who extended their contract from 3 to 4 years to get into the bonus program.

This appendix illustrates the calculations for TB and CB bonuses that result in 5 "new" men per 100 bonus enlistments. Of the 95 recruits who would have enlisted anyway we estimated that 70 recruits would have selected the same job as their bonus and the remainder, 25, would have chosen other jobs.

The likelihood that a bonus recruit who would have enlisted anyway extends his contract from 3 to 4 years depends on the type of job the recruit would have taken in the absence of the bonus. We estimated that the proportions of recruits signing 3-year contracts in the absence of the bonus were as follows:

- 10 percent of TB qualified recruits who would have signed up for technical jobs
- 50 percent of CB qualified recruits who would have signed up for combat jobs
- 50 percent of both TB and CB qualified recruits who would have joined the Marine Corps but chosen jobs other than the jobs required for their bonus.

With one exception, these Marines were treated as giving an extra year of productive service. The exception was TB recruits who would have signed for "other" jobs in the absence of the bonus. Because their training time would ordinarily be extended from 6 months to 1 year they were treated as providing only 6 extra months of productive service.*

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* Unfortunately this comparison does NOT allow us to place any value on the relative worth of a recruit in a technical area as opposed to a non-technical area. Because of this we are ignoring one of the major benefits of the bonus. In addition, all productive years are treated equally. The contract lengthening effect generates extra men in the fourth year. If these men are more productive than those in the third year we are again not capturing all the benefits of the bonus. On the other hand, there will be some recruits who never finish their fourth year.

Table F-1 illustrates our calculations to determine the number of extra productive service years generated by the contract lengthening effect of the TB and CB bonuses. The totals were 10.75 for TB and 42.5 for CB. Because so few 3-year people are trained in technical jobs, the contract lengthening effect is much greater for CB than for TB.

Before calculating the cost-effectiveness figures, we combined the extra productive service years to determine the equivalent number of 4-year contracts they represent. This calculation differed for TB and CB. For the TB calculations we estimated that the "new" bonus recruit typically spends 1 year in training and 3 years serving in his trained MOS. Thus, it takes 3 years of productive service to provide the equivalent of a 4-year contract. For CB the "new" recruit is typically trained for 6 months and gives 3-1/2 years of productive service. It, therefore, takes 3-1/2 years of productive service to provide the equivalent of a 4-year contract. The number of equivalent contracts generated by the contract lengthening effect is 3.6 for TB and 12.1 for CB (see table F-2).

In addition to knowing the number of equivalent 4-year contracts we also need to know the cost outlay the bonus involves. These figures are shown in column 5 of table F-2. Again the figures differ between TB and CB. The cost outlay figure for the TB estimate was calculated as follows. Because 10 percent of TB recruits complete their enlistment in MOSs that are not eligible for payment, the $3,000 bonus payment for 100 TB recruits represents an expenditure of $270,000 (90 x $3,000 = $270,000). In addition, the 3.6 equivalent contracts generated from the contract lengthening effect are generated without the initial year of expenditure on wages and training costs. The $270,000 of bonus payment has to be corrected for this savings. The figure we used was $16,000 for each of the 3.6 new equivalent contracts or a total of $57,600. This is made up of $10,000 wage costs for the year plus $6,000 of training costs. The latter is a minimum figure. Marine Corps costs estimates put the average cost of training in some of the technical skills at this level. Many are higher. The figure of $190,600 in column 5 of table F-2 is the present value of this expenditure. (The $270,000 was discounted for 1 year at 10 percent. The $57,600 was discounted for 1/2 year at 10 percent.)

The CB cost estimate assumes a bonus expenditure of $300,000. (Very few CB recruits fail to receive eligible MOSs.) The contract lengthening effect is assumed to save 1/2 year of wages and training costs for each new equivalent contract. The present value of this expenditure is $191,275.

The last column of table F-2 shows the cost-effectiveness figures for TB and CB bonuses that result in 5 new men per 100 bonuses given. The figures are approximately $22,000 for TB and $11,000 for CB. Similar calculations were made for the bonuses assuming 10 or 20 "new" men were generated. The results are show in chapter 5.

TABLE F-1

EXTRA PRODUCTIVE SERVICE YEARS FOR $3,000 BONUS [a]

Bonus	Number of men who would have enlisted anyway		Proportion extending their contract by 1 year	Number extending their contract by 1 year	Extra productive[b] service years
TB	Same job	70	10	7.0	7.0
	Other job	25	30	7.5	3.75
CB	Same job	70	50	35.0	35.0
	Other job	25	30	7.5	7.5

[a]Assumes the bonus generates 5 new men per 100 bonuses given.
[b]We estimate that TB recruits who would have taken other jobs provide only 6 months of extra productive service. Other bonus recruits provide 1 extra year of productive service.

TABLE F-2

COST-EFFECTIVENESS CALCULATIONS FOR $3,000 BONUSES[a]

Bonus	(1) Extra productive service years[b]	(2) Years needed to generate an equivalent 4-year contract	(3) Number of equivalent 4-year contracts (1)/(2)	(4) Total number of contracts 5 + (3)	(5) Cost outlay for bonus program	(6) Cost-effectiveness results (5)/(4)
TB	10.75	3.0	3.6	8.6	$190,600	$22,162
CB	42.5	3.5	12.1	17.1	191,275	11,186

[a]Assumes the bonus generates 5 new men per 100 bonuses given.
[b]These arise from the contract lengthening effect of the bonus.

We also estimated the cost of generating the equivalent of an additional 4-year enlistment with respect to the bonus skill areas. Our cost figures are $7,338 for technical skills and $5,192 for combat arms.* In each case we assumed that 30 of 100 bonus recipients were new to the job while the remaining 70 would have taken the same job. We used the proportions of 10 percent for TB and 50 percent for CB to estimate the contract lengthening effect among the 70 recruits who would have enlisted anyway.

With respect to cost outlays we included a $300,000 expenditure for both TB and CB and we adjusted this expenditure for savings in wages and training costs among those who extend their contracts (see table F-3).

Finally, we made an attempt to determine the cost effectiveness of the bonus program for FY 1982. We adjusted the FY 1982 quotas to reflect a 25 percent dropout rate from combat skills and a 40 percent dropout rate from technical skills.** Tables F-4 and F-5 show our calculations. Table F-4 indicates how we calculated the number of new men generated by the FY 1982 program. We estimate that the current program will generate approximately 456 "new" enlistments. Because some recruits will enlist for 4 years rather than 3, we estimate the program will generate the equivalent of 686 new 4-year contracts. Adjusting for savings in wages and training costs*** we estimate the cost per equivalent contract at $12,840 (see table F-5).

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* Neither of these figures reflect the large number of OPEN enlistments which could be used to fill MOSs in the absence of bonus recruits.
** The current $2,500 and $4,500 bonus payments reflect primarily payments for combat skills.
*** Because the contract lengthening effect is primarily among combat arms enlistees the calculations reflect the cost savings involved in their training.

TABLE F-3

COST-EFFECTIVENESS OF $3,000 BONUS FOR THE SKILL AREAS

Bonus	(1) New men	(2) Number extending their contract by 1 year	(3) Years needed to generate an equivalent 4-year contract	(4) Number of equivalent 4-year contracts	(5) Total number of new contracts 30 + (4)	(6) Cost outlay	(7) Cost effectiveness results (6)/(5)
TB	30	7[a]	3.0	2-1/3	32-1/3	$237,223	$7,338
CB	30	35[b]	3.5	10	40	207,665	5,192

[a]70 men x 10 percent.
[b]70 men x 50 percent.

TABLE F-4

ESTIMATED NEW MEN FROM CURRENT BONUS PROGRAM

Bonus level	Quota[a]	New men per[b] 100 bonuses	Number of new men
$2,500	1,450	10	145
3,000	1,025	12	123
3,500	720	14	101
4,500	450	18	81
5,000	30	20	6
	3,675		456[c]

[a]Quota is adjusted for a 25 percent dropout rate from combat skills and a 40 percent dropout rate from technical skills.
[b]Interpolated from our results with the current TB and CB bonus levels.
[c]Equivalent to 686 new 4-year contracts because bonus also induces some recruits to enlist for 4 years rather than for 3.

TABLE F-5

COST PER EQUIVALENT 4-YEAR CONTRACT
FOR CURRENT BONUS PROGRAM

(1)	Adjusted total quota	3,675
(2)	Estimated new men	456
(3)	Number who would have enlisted anyway (1)-(2)	3,219
(4)	Extra contract years (3) x .25[a]	805
(5)	Equivalent contracts (4)/3.5[b]	230
(6)	Total equivalent 4-year contracts (2)+(5)	686
(7)	Adjusted expenditure for bonus enlistees[c]	$8,808,558
(8)	Cost per equivalent contract (7)/(6)	$12,840

[a]We estimate that 25 percent of those who would have enlisted anyway extend their contracts by 1 year.
[b]We estimate it takes 3.5 men extending their contracts by 1 year to generate the productive service time of a new 4-year enlistment.
[c]Adjusted for savings in wages and training costs of $8,000 for each of the 230 equivalent contracts.

APPENDIX G

COST-EFFECTIVENESS CALCULATIONS FOR GI BILL

APPENDIX G

COST-EFFECTIVENESS CALCULATIONS FOR GI BILL

With a 10 percent discount rate the present value of a $16,000 GI Bill is approximately $9,300. The equivalent increment to a 4-year pay stream is $3,576. This would have raised the FY 1981 military-to-civilian pay ratio by 37 percent. With a 50 percent use rate, the increase in new high school graduate enlistments in mental groups I to IIIA would be between 1,572 and 3,145 depending on whether the pay elasticity is .5 or 1. (This is based on a current figure of 17,000 HSG mental groups I to IIIA enlistments.) If the GI Bill benefit is available to all high school graduates, a 50 percent use rate would imply 15,000 users. The cost of the GI Bill would be approximately $140 million, present value. The cost per new high school graduate mental groups I to IIIA would be between $44,500 and $90,000 depending on the pay elasticity. Note that this figure is not corrected for the lower reenlistment rate, which would occur as recruits leave the service to use their benefits.

APPENDIX H

DESCRIPTIVE INFORMATION FOR RECRUITS
FY 1980

APPENDIX H

DESCRIPTIVE INFORMATION FOR RECRUITS FY 1980

This appendix contains descriptive tables for all USMC recruits enlisted in FY 1980.

TABLE H-1

ENLISTMENT LENGTHS FOR ALL RECRUITS, FY 1980

	Frequency	Percent
2 years	47	0.1
3 years	14,134	34.9
4 years	26,254	64.7
6 years	112	0.3
	40,547	100.0

TABLE H-2

EDUCATION CODES AND LEVELS FOR ALL RECRUITS, FY 1980

Code	Level	Frequency	Percent
0	12 years	1,320	3.3
1	Less than 12 yrs	8,057	19.9
2	High school diploma	26,736	66.1
3	Certificate of high school equivalency	1,269	3.1
4, 6, 7	Certificate of high school completion or attendance	1,580	3.9
5	Completion of education above 12th grade	1,284	3.2
A, D, K, N	College certificate or degree	251	.6
		40,547	100.1

TABLE H-3

YEARS OF EDUCATION, FY 1980

Years of education	Frequency	Percent
Less than 12	8,059	19.9
12	31,090	76.7
13	668	1.6
More than 13	730	1.8
	40,547	100.0

TABLE H-4

AGE DISTRIBUTION, FY 1980

Age Category	Frequency	Percent
Less than 18	12,949	31.9
18	12,681	31.3
19	6,849	16.9
20	3,389	8.4
21	1,713	4.2
22	1,111	2.7
23	709	1.7
Greater than 23	1,146	2.8
	40,547	99.9

TABLE H-5

SEX, FY 1980

Sex	Frequency	Percent
Male	38,291	94.4
Female	2,256	5.6
	40,547	100.0

TABLE H-6

RACIAL DISTRIBUTION, FY 1980

Race	Frequency	Percent
Black	9,355	23.1
Hispanic	2,046	5.0
Other	1,052	2.6
White	28,094	69.3
	40,547	100.0

TABLE H-7

AFEES MENTAL GROUP DISTRIBUTION, FY 1980[a]

Mental category	AFQT score	Frequency	Percent
I	93-100	1,267	3.1
IIA	82-92	2,083	5.1
IIB	65-81	7,273	17.9
IIIA	50-64	13,195	32.6
IIIB	31-49	15,093	37.2
IVA	21-30	1,636	4.0
		40,547	99.9

[a]Based on operational norms in use at time of enlistments. This norm was later shown to be incorrect and lead to overestimates of recruit ability.

TABLE H-8

AFEES EL SCORE DISTRIBUTION, FY 1980[a]

EL score	Frequency	Percent
130 or greater	1,903	4.7
120 to 129	3,807	9.4
110 to 119	10,113	24.9
100 to 109	9,395	23.2
90 to 99	10,639	26.2
Less than 90	4,690	11.6
	40,547	100.0

[a]Based on operational norms in use at time of enlistments. This norm was later shown shown to be incorrect and lead to overestimates of recruit ability.

TABLE H-9

AFEES GT SCORE DISTRIBUTION, FY 1980[a]

GT score	Frequency	Percent
130 or greater	1,286	3.2
120 to 129	3,832	9.5
110 to 119	9,547	23.5
100 to 109	9,303	22.9
90 to 99	11,992	29.6
Less than 90	4,587	11.3
	40,547	100.0

[a]Based on operational norms in use at time of enlistments. This norm was later shown to be incorrect and lead to overestimates of recruit ability.

TABLE H-10

MENTAL GROUP DISTRIBUTION FOR PROGRAM GUARANTEES[a]

Program	Mental Group Category						Total
	I	IIA	IIB	IIIA	IIIB	IV & V	
Avionics	9.0	15.2	39.4	32.1	4.3	0.0	100.0
Air ordnance	4.4	14.0	39.7	36.8	5.1	0.0	100.0
Air support	0.5	2.8	16.1	39.6	40.9	0.0	100.0
Air technical support	8.4	14.2	43.6	30.3	3.4	0.1	100.0
Aircraft maintenance	2.1	4.0	18.8	42.0	33.0	0.1	100.0
CB	5.9	5.9	21.2	33.6	33.2	0.2	100.0
TB	21.9	25.9	41.9	9.5	0.9	0.0	100.0
Combat support	1.3	4.9	18.9	35.4	39.5	0.0	100.0
Administration	2.2	4.6	19.3	45.5	28.4	0.0	100.0
Logistics	1.7	3.8	15.0	44.6	34.9	0.0	100.0
Mechanical/electrical	0.9	2.7	12.3	29.6	54.5	0.0	100.0
Nonbonus combat	4.4	4.4	14.0	28.1	49.1	0.0	100.0
Infantry	4.3	10.0	22.5	31.5	31.8	0.3	100.0
Personnel admin	1.2	5.1	16.6	43.7	33.4	0.0	100.0
Motor transport	0.3	2.0	13.6	28.3	55.6	0.3	100.0
Radio communications	2.1	2.2	21.0	40.2	34.5	0.1	100.0
Electronics	6.6	8.0	39.1	34.9	11.4	0.0	100.0
Food	1.3	2.2	12.8	29.4	54.3	0.0	100.0
Computer	27.6	29.4	30.1	11.0	1.8	0.0	100.0
Military police	3.4	6.6	25.6	30.5	33.9	0.0	100.0
Open	2.6	3.8	13.7	25.3	44.0	10.6	100.0
Other	10.2	12.8	34.2	29.4	13.4	0.0	100.0
All	3.7	5.7	18.5	29.8	37.4	4.9	100.0

[a]High school graduate enlistees, FY 1980.

TABLE H-11

DISTRIBUTION OF MENTAL GROUPS
INTO PROGRAM GUARANTEES[a]

Program	Mental Group Category						Total
	I	IIA	IIB	IIIA	IIIB	IV & V	
Avionics	8.4	9.2	7.3	3.7	0.4	0.0	3.5
Air ordnance	0.5	1.1	1.0	0.6	0.1	0.0	0.5
Air support	0.5	1.5	2.7	4.1	3.3	0.0	3.1
Air technical support	5.5	6.1	5.7	2.5	0.2	0.1	2.4
Aircraft maintenance	3.2	4.0	5.8	8.0	5.0	0.1	5.7
CB	9.6	6.3	6.9	6.8	5.4	0.2	6.0
TB	18.5	14.3	7.1	1.0	0.1	0.0	3.1
Combat support	0.7	1.8	2.1	2.5	2.2	0.0	2.1
Administration	1.7	2.4	3.0	4.4	2.2	0.0	2.9
Logistics	1.3	1.9	2.3	4.2	2.6	0.0	2.8
Mechanical/electrical	1.8	3.3	4.7	7.0	10.3	0.1	7.1
Nonbonus combat	0.9	0.6	0.6	0.7	1.0	0.0	0.8
Infantry	3.1	4.7	3.2	2.8	2.3	0.1	2.7
Personnel	0.5	1.2	1.2	2.0	1.2	0.0	1.4
Motor transport	0.2	0.9	2.0	2.5	4.0	0.1	2.7
Radio communications	1.3	0.9	2.6	3.1	2.1	0.1	2.3
Electronics	2.1	1.6	2.5	1.4	0.4	0.0	1.2
Food	0.4	0.4	0.7	1.0	1.5	0.0	1.0
Computer	4.1	2.8	0.9	0.2	0.0	0.0	0.5
Military police	1.1	1.4	1.6	1.2	1.1	0.0	1.2
Open	32.0	31.0	34.1	39.2	54.2	99.2	46.1
Other	2.9	2.4	1.9	1.0	0.4	0.0	1.0
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a]High school graduate enlistees, FY 1980.

TABLE H-12

PERCENT BLACK IN EACH MENTAL GROUP
FOR PROGRAM GUARANTEES[a]

Program	Mental Group Category					
	I	IIA	IIB	IIIA	IIIB	IV-V
Avionics	2.2	3.8	6.9	13.6	20.5	-
Air ordnance	-[b]	0.0	0.0	10.0	-	-
Air support	-	11.5	13.6	24.6	40.1	-
Air technical support	1.6	2.9	5.0	8.6	24.0	-
Aircraft maintenance	0.0	2.9	5.0	13.5	26.5	-
CB	1.9	2.8	3.9	6.8	23.8	-
TB	2.9	4.5	5.3	5.6	-	-
Combat support	-	0.0	1.7	3.6	18.5	-
Administration	0.0	5.0	15.6	33.6	60.4	-
Logistics	0.0	12.5	11.1	31.7	53.6	-
Mechanical/ electrical	0.0	1.8	4.2	13.3	33.3	-
Nonbonus combat	-	-	6.3	6.3	25.0	-
Infantry	0.0	0.0	1.1	5.2	11.0	-
Personnel	0.0	4.8	16.2	31.3	63.5	-
Motor transport	0.0	0.0	0.0	8.4	28.4	-
Radio communications	0.0	0.0	7.7	23.4	47.7	-
Electronics	0.0	3.6	9.5	15.6	27.5	-
Food	-	-	10.0	15.2	46.5	-
Computer	2.2	10.4	10.2	16.7	-	-
Military police	0.0	0.0	4.4	6.5	14.3	-
Open	1.7	5.7	9.1	21.8	45.4	59.4
Other	0.0	0.0	1.9	10.9	7.1	-
All	1.7	4.2	7.1	18.1	39.7	59.1

[a]High school graduate enlistees, FY 1980.
[b]Dashes indicate a frequency of 10 or less recruits.

APPENDIX 1

DEMOGRAPHIC INFORMATION FOR BONUS QUALIFIED RECRUITS

APPENDIX I

DEMOGRAPHIC INFORMATION FOR BONUS QUALIFIED RECRUITS

This appendix contains demographic information for recruits qualified for either the technical skills bonus or the combat arms bonus in FY 1980.

TABLE I-1

PROGRAM GROUPINGS

Name	Code	Programs
Aviation, technical	AVIATION/TECH	A5, A6, A8
Aviation, support	AVIATION/SUPPORT	A7, A9
Combat Bonus Comparison	CB COMPARISON	Z1, Z6, G1
Ground Field Programs	GROUND FIELD	G2, G3, G6, G8
Ground Subprograms	GROUND SUB	Z2, Z3
Mechanical/Electrical	MECH/ELEC	Z4, G4,G5, G7
Other	OTHER	Location, Band, 6 year Non-bonus options
Combat Bonus	CB	
Technical Bonus	TB	

TABLE I-2

CHARACTERISTICS OF "TB QUALIFIED" RECRUITS BY PROGRAM GUARANTEES, FY 1980

Program	Percentage	Percent separated	Percent boot camp dropout	Percent ≥ 4-year enlistment	Percent black	Percent female	Percent married
AVIATION/SUPPORT							
Air Support	1.3	5.3	5.3	100.0	8.8	3.5	1.8
Aircraft Maintenance	4.4	7.1	6.6	99.5	0.0	0.5	4.0
AVIATION/TECH							
Avionics	8.6	6.8	5.7	99.7	3.4	4.2	3.6
Air Ordnance	0.8	2.7	2.7	100.0	0.0	2.7	2.7
Air Tech Support	5.4	7.4	6.6	99.6	2.9	6.2	3.3
CB	7.2	10.5	8.6	99.1	1.5	0.0	2.5
TB	18.5	9.1	6.4	100.0	4.2	6.3	5.2
CB COMPARISON							
Combat Support	1.5	8.8	5.9	44.1	1.5	0.0	2.9
Nonbonus Combat	0.6	11.1	11.1	48.1	0.0	0.0	3.7
Infantry	3.5	9.6	6.4	35.9	0.6	0.0	1.9
GROUND FIELD							
Personnel Admin	0.6	27.6	27.6	37.9	3.4	10.3	0.0
Motor Transport	1.2	0.0	1.9	98.1	0.0	0.0	0.0
Food	0.5	13.6	13.6	50.0	0.0	0.0	9.1
Military Police	1.2	14.8	11.1	100.0	1.9	3.7	7.4

TABLE I-2 (Cont'd)

Program	Percentage	Percent separated	Percent boot camp dropout	Percent ≥ 4-year enlistment	Percent black	Percent female	Percent married
GROUND SUB							
Administration	1.8	12.3	9.9	63.0	4.9	12.3	3.7
Logistics	1.6	21.4	17.1	48.6	4.3	14.3	7.1
MECH/ELEC							
Mech/Elec	3.3	9.4	5.4	100.0	0.7	0.7	4.8
Radio Comm	1.3	14.0	12.3	56.1	3.5	7.0	1.8
Electronics	2.1	6.5	6.5	100.0	2.2	6.5	1.1
Computer	2.4	6.5	4.6	100.0	5.6	18.5	7.4
OPEN	29.9	12.8	11.4	62.3	3.9	3.8	6.3
OTHER	2.4	14.4	11.7	80.2	0.9	15.3	2.7
ALL	100.0	10.3	8.5	82.0	3.1	4.7	4.6

TABLE I-3

DELAY TIME FOR PROGRAM GROUPS
"TB QUALIFIED" RECRUITS, FY 1980

Program	Months delay in shipping					Total
	0	< 1	1-3	4-6	< 6	
AVIATION/SUPPORT	1.6	16.1	28.6	9.0	44.7	100.0
AVIATION/TECH	2.0	19.0	26.3	12.6	40.1	100.0
CB	2.2	20.2	43.6	13.6	20.4	100.0
CB COMPARISON	8.0	33.0	29.0	10.0	20.0	100.0
GROUND FIELD	2.5	22.8	25.3	11.4	38.0	100.0
GROUND SUB	5.3	22.5	27.2	7.9	37.1	100.0
MECH/ELEC	1.7	19.8	25.2	13.1	40.2	100.0
OPEN	11.4	46.2	25.8	5.3	11.3	100.0
OTHER	4.3	24.3	39.2	16.6	15.6	100.0
TB	3.2	26.8	36.1	10.6	23.3	100.0
ALL	5.5	29.7	29.7	9.7	25.4	100.0

TABLE I-4

RACIAL DISTRIBUTION FOR
PROGRAM GROUPS "TB QUALIFIED" RECRUITS, FY 1980

Program	Race				
	Black	Hispanic	Other	White	Total
AVIATION/SUPP	2.0	3.1	1.6	93.3	100.0
AVIATION/TECH	3.0	1.2	0.8	95.0	100.0
CB	1.5	0.6	1.5	96.4	100.0
CB COMPARISON	0.8	0.8	0.4	98.0	100.0
GROUND FIELD	1.3	0.0	1.3	97.4	100.0
GROUND SUB	4.6	2.6	1.3	91.5	100.0
MECH/ELEC	2.7	2.0	1.7	93.6	100.0
OPEN	3.9	1.5	1.3	93.3	100.0
OTHER	0.9	0.9	7.2	91.0	100.0
TB	4.2	1.0	0.7	94.1	100.0
ALL	3.1	1.4	1.3	94.2	100.0

TABLE I-5

DISTRIBUTION OF EACH MENTAL GROUP INTO
PROGRAM GROUPS "TB QUALIFIED" RECRUITS, FY 1980

Program	Mental Group Category			
	I	II A	II B	III A
AVIATION/SUPP	3.5	5.0	6.9	7.9
AVIATION/TECH	14.3	15.4	14.8	14.4
CB	9.9	6.1	6.5	7.0
CB COMPARISON	4.7	7.4	5.0	4.8
GROUND FIELD	2.0	3.8	4.1	3.8
GROUND SUB	2.7	3.6	3.4	4.1
MECH/ELEC	9.0	8.3	9.5	8.9
OPEN	31.1	29.4	29.3	31.7
OTHER	3.0	2.6	2.1	2.2
TB	19.8	18.4	18.4	15.2
ALL	100.0	100.0	100.0	100.0

TABLE I-6

DISTRIBUTION OF RACIAL GROUPS
INTO PROGRAM GROUPS
"TB QUALIFIED" RECRUITS, FY 1980

Program	Black	Hispanic	Other	White	All
AVIATION/SUPP	3.5	13.1	7.0	5.6	5.7
AVIATION/TECH	14.3	13.1	8.8	14.9	14.7
CB	3.5	3.3	8.8	7.4	7.2
CB COMPARISON	1.4	3.3	1.8	5.8	5.6
GROUND FIELD	1.4	0.0	3.5	3.6	3.5
GROUND SUB	5.0	6.6	3.5	3.3	3.5
MECH/ELEC	7.8	13.1	12.3	8.9	9.0
OPEN	37.6	32.8	29.8	29.6	29.8
OTHER	0.7	1.6	14.0	2.4	2.5
TB	24.8	13.1	10.5	18.5	18.5
ALL	100.0	100.0	100.0	100.0	100.0

TABLE I-7

EDUCATIONAL DISTRIBUTION FOR PROGRAM GROUPS
"TB QUALIFIED" RECRUITS, FY 1980

	Education				
Program	High school diploma graduate	College	High school certificate	Post high school	Total
AVIATION/SUPP	91.0	0.0	1.6	7.4	100.0
AVIATION/TECH	91.0	1.6	1.2	6.2	100.0
CB	83.0	1.8	2.5	12.7	100.0
CB COMPARISON	82.4	2.4	3.6	11.6	100.0
GROUND FIELD	86.6	5.1	1.3	7.0	100.0
GROUND SUB	85.4	2.6	1.3	10.7	100.0
MECH/ELEC	88.9	2.2	2.5	6.4	100.0
OPEN	81.1	2.4	4.1	12.4	100.0
OTHER	67.6	7.2	4.5	20.7	100.0
TB	87.4	1.1	3.2	8.3	100.0
ALL	85.2	2.1	2.9	9.8	100.0

TABLE I-8

MENTAL GROUP DISTRIBUTION FOR PROGRAM GROUPS
"TB QUALIFIED" RECRUITS, FY 1980

Program	AFQT Mental Category				Total
	I	II A	IIB	IIIA	
AVIATION/SUPP	14.1	25.1	51.0	9.8	100.0
AVIATION/TECH	22.0	29.7	41.5	6.8	100.0
CB	31.1	24.1	38.0	6.8	100.0
CB COMPARISON	19.1	37.5	37.4	6.0	100.0
GROUND FIELD	12.6	30.4	49.4	7.6	100.0
GROUND SUB	19.5	30.5	42.4	8.6	100.0
MECH/ELEC	22.7	26.2	44.2	5.9	100.0
OPEN	23.7	27.9	41.0	7.4	100.0
OTHER	27.9	29.8	36.0	6.3	100.0
TB	24.3	28.2	41.7	5.8	100.0
ALL	22.7	28.4	41.9	7.0	100.0

TABLE I-9

CHARACTERISTICS OF ALL "CB QUALIFIED" RECRUITS
IN PROGRAM GROUPS, FY 1980

Program	Frequency	Percentage	Percent ≥ 4 year enlistment	Percent ≥ 6 months delay time	Percent black	Percent married
AVIATION/SUPP	2,512	10.3	100.0	54.9	20.0	3.5
AVIATION/TECH	1,795	7.3	100.0	41.0	7.7	3.8
CB	1,891	7.7	100.0	25.5	11.0	4.3
CB COMPARISON	1,598	6.5	61.6	19.3	6.1	3.5
GROUND FIELD	1,497	6.2	78.9	38.4	20.4	4.3
GROUND SUB	1,256	5.1	48.9	38.5	37.7	5.5
MECH/ELEC	2,727	11.3	89.7	44.6	20.3	3.8
OPEN	10,019	41.0	57.0	12.0	24.4	4.7
OTHER	254	1.0	81.5	21.2	5.5	2.4
TB	878	3.6	100.0	24.6	4.9	5.5
ALL	124,427	100.0	73.2	27.2	19.6	4.3

TABLE I-10

DELAY TIME FOR PROGRAM GROUPS
HIGH SCHOOL GRADUATE "CB QUALIFIED" RECRUITS, FY 1980

	Months delay in shipping					
Program	0	< 1	1-3	4-6	< 6	Total
AVIATION/SUPP	1.3	12.5	21.6	8.8	55.8	100.0
AVIATION/TECH	1.9	17.1	24.9	14.2	41.9	100.0
CB	1.7	18.0	38.8	14.8	26.7	100.0
CB COMPARISON	6.2	33.6	27.3	13.0	19.9	100.0
GROUND FIELD	3.4	21.2	23.2	13.3	38.9	100.0
GROUND SUB	3.9	22.6	23.5	10.7	39.3	100.0
MECH/ELEC	2.4	21.9	21.6	9.2	44.9	100.0
OPEN	11.0	44.2	24.8	7.2	12.8	100.0
OTHER	3.2	31.4	32.8	11.5	21.1	100.0
TB	2.7	25.5	35.9	11.2	24.7	100.0
ALL	6.0	30.0	25.7	9.9	28.4	100.0

TABLE I-11

RACIAL DISTRIBUTION FOR PROGRAM GROUPS
"CB QUALIFIED" HSG RECRUITS, FY 1980

	Race				
Program	Black	Hispanic	Other	White	Total
AVIATION/SUPP	20.2	7.4	2.0	70.4	100.0
AVIATION/TECH	7.7	3.3	0.9	88.1	100.0
CB	11.0	4.2	2.0	82.8	100.0
CB COMPARISON	6.3	2.6	1.6	89.5	100.0
GROUND FIELD	20.3	4.3	1.5	73.9	100.0
GROUND SUB	37.9	7.6	2.1	52.4	100.0
MECH/ELEC	20.4	5.2	2.0	72.4	100.0
OPEN	25.4	4.5	3.1	67.0	100.0
OTHER	5.6	1.6	18.3	74.5	100.0
TB	4.9	1.1	0.7	93.3	100.0
ALL	19.9	4.6	2.4	73.1	100.0

TABLE I-12

DISTRIBUTION OF EACH MENTAL GROUP
INTO PROGRAM GROUPS HSG
"CB QUALIFIED" RECRUITS, FY 1980

	Mental Group Category					
Program	I	II A	II B	III A	III B	ALL
AVIATION/SUPP	3.8	5.8	8.6	12.9	16.2	10.5
AVIATION/TECH	14.4	16.4	14.4	7.6	0.9	7.5
CB	10.4	6.9	7.8	8.0	7.1	7.7
CB COMPARISON	5.2	7.9	6.7	7.1	5.8	6.5
GROUND FIELD	2.2	3.9	5.0	6.3	8.2	6.4
GROUND SUB	2.6	3.4	3.5	6.0	6.4	5.3
MECH/ELEC	8.7	7.6	10.5	12.4	12.7	11.6
OPEN	32.2	31.0	34.0	37.5	47.3	39.6
OTHER	2.5	2.0	1.9	1.1	0.3	1.1
TB	18.0	15.1	7.6	1.1	0.1	3.8
ALL	100.0	100.0	100.0	100.0	100.0	100.0

TABLE I-13

DISTRIBUTION OF RACIAL GROUPS INTO PROGRAM GROUPS
HSG "CB QUALIFIED" RECRUITS, FY 1980

	Race				
Program	Black	Hispanic	Other	White	All
AVIATION/SUPP	10.7	16.7	8.6	10.2	10.5
AVIATION/TECH	2.9	5.4	2.6	9.2	7.6
CB	4.2	7.0	6.3	8.7	7.7
CB COMPARISON	2.1	3.7	4.5	8.0	6.5
GROUND FIELD	6.5	5.9	3.9	6.4	6.4
GROUND SUB	10.1	8.6	4.7	3.8	5.3
MECH/ELEC	11.9	12.9	9.7	11.5	11.6
OPEN	50.4	38.5	50.4	36.3	39.5
OTHER	.3	0.4	8.2	1.1	1.1
TB	.9	0.9	1.1	4.8	3.8
ALL	100.0	100.0	100.0	100.0	100.0

TABLE I-14

EDUCATIONAL DISTRIBUTION FOR PROGRAM GROUPS,
ALL "CB QUALIFIED" RECRUITS, FY 1980

Program	High school graduate & college	High school certificate	Post high school	GED	Total
AVIATION/SUPP	90.8	3.9	2.7	2.6	100.0
AVIATION/TECH	91.5	2.0	4.0	2.5	100.0
CB	85.9	3.7	4.7	5.7	100.0
CB COMPARISON	87.2	4.0	3.8	5.0	100.0
GROUND FIELD	91.3	3.5	3.7	1.5	100.0
GROUND SUB	87.9	3.8	6.1	2.2	100.0
MECH/ELEC	92.7	2.6	3.7	1.0	100.0
OPEN	80.3	6.9	4.4	8.4	100.0
OTHER	85.2	3.4	10.6	.8	100.0
TB	88.7	3.3	7.8	.2	100.0
ALL	85.9	4.9	4.2	5.0	100.0

TABLE I-15

MENTAL GROUP DISTRIBUTION FOR PROGRAM GROUPS
"CB QUALIFIED" RECRUITS, FY 1980

	Mental group category					
Program	I	IIA	IIB	IIIA	IIIB	Total
AVIATION/SUPP	1.6	3.6	17.1	40.1	37.6	100.0
AVIATION/TECH	8.3	14.3	40.4	32.7	4.3	100.0
CB	5.9	5.9	21.5	34.0	32.7	100.0
CB COMPARISON	3.4	8.0	21.7	35.5	31.4	100.0
GROUND FIELD	1.5	4.1	16.8	32.2	45.4	100.0
GROUND SUB	2.1	4.2	13.9	36.9	42.9	100.0
MECH/ELEC	3.3	4.3	19.2	34.7	38.5	100.0
OPEN	3.5	5.2	18.2	31.1	42.0	100.0
OTHER	9.9	12.3	36.9	31.8	9.1	100.0
TB	20.7	26.3	42.6	9.7	0.7	100.0
ALL	4.3	6.6	21.2	32.7	35.2	100.0

TABLE I-16

TIMING OF SEPARATION FOR "CB QUALIFIED" RECRUITS
IN SELECTED PROGRAMS, FY 1978

Program	Early separation rate	Separated between 0 and 3 months	Separated between 3 months and 1 year	Separated between 1 and 1-1/2 years	Separated between 1-1/2 and 2 years	Separated after 2 years
CB	.22	39.3	14.5	13.1	12.4	20.7
CB COMPARISON	.23	36.4	21.6	13.1	8.3	20.6
OPEN	.29	41.7	16.1	13.1	10.4	18.7
All	.24	40.3	15.0	13.4	10.8	20.5

APPENDIX J

THE LOGIT MODEL

APPENDIX J

THE LOGIT MODEL

This appendix elaborates on the logit model used to analyze program allocation. With programs grouped into four categories, the probability that a recruit with a given set of characteristics will be in the technical bonus program, P_1, can be estimated by the logit model where:

$$P_1 = \frac{e^{XB_1}}{\sum_{i=1}^{4} e^{XB_i}} \qquad i = 1, 2, 3, 4 .$$

The X vector includes the background characteristics of interest, while the B vector contains coefficients obtained from maximum likelihood estimation. The predicted effect on P of changing any X, $\partial P/\partial X$, is not a constant but depends on the value of the other Xs in the equation. Evaluating $\partial P_i/\partial X_j$ at the mean of each X gives:

$$\partial P_i / \partial X_j = P_i \left(B_{ij} - \sum_{k=1}^{4} B_{kj} P_k \right) \qquad k = 1, 2, 3, 4,$$

where B_{ij} = coefficient of Xj in the equation for P_i. Note that the

$$\sum_{i=1}^{4} \partial P_i / \partial X_j = 0 .$$

Each recruit is in one of the four groups so for any characteristic the probabilities of being in the four groups adds to one. The marginal results, $\partial P/\partial X$, show how each of the four probabilities change when the value of the characteristic being considered replaces the value of the same characteristic in the base case. The marginal effects sum to zero because the total probability is still equal to one. Hence, the increase in the probability of being in one group must be perfectly offset by a decrease in the probability of being in some other group.

APPENDIX K

MARINE CORPS SURVIVAL AMONG QUALIFIED RECRUITS, FY 1980

APPENDIX K

MARINE CORPS SURVIVAL AMONG QUALIFIED RECRUITS, FY 1980

Because of concern about separation rates among recruits recently accessed into the technical skills bonus program (see table K-1) both boot camp graduation and survival were examined for recruits with dates of enlistment in FY 1980. Survival through March 1981 was examined. This is erage of 1 year from date of enlistment. The independent variables were the same as those used previously except that the AVIATION/TECH and AVIATION/SUPPORT variables were combined into a single AVIATION category. The results are shown in table K-2.

Several demographic characteristics had a significant relationship to survival. Both the AGE and FEMALE variables had a negative relationship to survival, as they did for the FY 1978 cohort. Among the program groups only TB and AVIATION were positively related to SURVIVAL. This again implies that enlistment in TB did not have a negative effect on survival. In fact, except for AVIATION, it contributed more to survival than any of the other program groups. Note that for this group enlistment in CB did not increase the chances of survival.

The Marine Corps was also concerned about short-term separation rates for combat arms bonus recruits (see table K-3). Boot camp graduation and survival were examined for recruits with dates of enlistment in FY 1980. Survival through an average of 1 year from date of enlistment was examined.

Survival was negatively related to the mental group categories and to AGE. It was positively related to HISPANIC, COLLEGE, and POST HIGH SCHOOL. Note that the coefficient for CB is positive but not significant. This means that recruits in CB were no less but no more likely to survive than those with an open enlistment. The same was true for the CB COMPARISON group (table K-4).

TABLE K-1

BOOT CAMP DROPOUT RATES AND SEPARATION RATES [a]
FOR "TB QUALIFIED" RECRUITS BY PROGRAM GROUP, FY 1980

Program	Percent boot camp dropout	Percent separated
AVIATION/SUPP	6.3	6.7
AVIATION/TECH	5.9	6.8
CB	8.6	10.5
CB COMPARISON	6.8	9.2
GROUND FIELD	11.4	12.0
GROUND SUB	13.2	16.6
MECH/ELEC	6.4	8.6
OPEN	11.4	12.8
OTHER	11.7	14.4
TB	6.4	9.1
ALL	8.5	10.3

[a]Separation before an average of 1 year from date of enlistment.

TABLE K-2

MARGINAL RESULTS FOR BOOT CAMP GRADUATION AND FOR SURVIVAL
TE "QUALIFIED" RECRUITS, FY 1980[a]

Characteristics	Boot camp graduation	Survival
MENTAL GROUP		
IIA	-.007	-.009
IIB	-.006	-.007
IIIA	-.032[b]	-.039[c]
AGE	-.012[c]	-.012[c]
DELAYED ENTRY TIME	.000	.0001[c]
RACE/ETHNIC		
BLACK	-.031	-.025
HISPANIC	-.024	-.011
FEMALE	-.036[c]	-.082[c]
MARRIED	-.001	-.015
EDUCATION		
COLLEGE	.064[c]	.053[c]
CERTIFICATE	.010	.008
POST HIGH SCHOOL	.022	.023
PROGRAMS		
TB	.040[c]	.028[c]
CB	.009	.003
AVIATION	.041[c]	.049[c]
MECH/ELEC	.036[c]	.027
ALL OTHER	-.001	-.011
ENLISTMENT LENGTH	-.008	-.017
PERCENT SURVIVED	91.5	89.7[d]

[a]Base case: single, white, male, high school diploma graduate in mental group I with an open enlistment.
[b]Significant at the 10 percent level.
[c]Significant at the 5 percent level.
[d]Survival through an average of 1 year from date of enlistment.

TABLE K-3

BOOT CAMP DROPOUT RATES AND SEPARATION RATES [a]
FOR "CB QUALIFIED" RECRUITS
BY PROGRAM GROUP, FY 1980

Program	Percent boot camp dropout	Percent separated
AVIATION/SUPPORT	7.9	8.7
AVIATION/TECH	6.7	7.6
CB	10.4	12.5
CB COMPARISON	10.5	12.7
GROUND FIELD	11.4	13.3
GROUND SUB	12.6	14.4
MECH/ELEC	8.8	10.6
OPEN	13.7	16.0
OTHER	9.4	11.0
TB	6.0	8.0
ALL	11.1	12.9

[a]Separation before an average of 1 year from date of enlistment.

TABLE K-4

MARGINAL RESULTS FOR BOOT CAMP GRADUATION
AND FOR SURVIVAL
"CB QUALIFIED" RECRUITS, FY 1980[a]

Characteristics	Boot camp graduation	Survival
MENTAL GROUP		
IIA	-.007	-.013
IIB	-.018[c]	.023[d]
IIIA	-.028[d]	-.034[d]
IIIB	-.053[d]	-.060[d]
AGE	-.025[d]	-.027[d]
DELAYED ENTRY TIME	-.00002	.00007[d]
RACE/ETHNIC		
BLACK	.004	-.005
HISPANIC	.024[d]	.027[d]
MARRIED	-.008	-.014
EDUCATION		
COLLEGE	.069	.064[d]
CERTIFICATE	-.024[d]	-.026[d]
POST HIGH SCHOOL	.039[d]	.036[d]
GED	-.063[d]	-.089[d]
PROGRAM		
TB	.039[d]	.032[d]
CB	.014[d]	.010
CB COMPARISON	.017[d]	.011
AVIATION/TECH	.033[d]	.037[d]
AVIATION/SUPP	.028[d]	.033[d]
MECH/ELEC	.024[d]	.020[d]
ALL OTHER	.001	-.0008
ENLISTMENT LENGTH	-.002	-.005
PERCENT WHO SURVIVED	88.9	87.1[b]

[a]Base case: single, white, male, high school diploma graduate in mental group I with an open enlistment.
[b]Survival through an average of 1 year from date of enlistment.
[c]Significant at the 10 percent level.
[d]Significant at the 5 percent level.

APPENDIX L

DEMOGRAPHIC INFORMATION FOR BONUS RECRUITS

APPENDIX L

DEMOGRAPHIC INFORMATION FOR BONUS RECRUITS

This appendix contains demographic information for recruits in TB and CB during fiscal years 1978, 1979, and 1980.

TABLE L-1

TEST SCORES FOR RECRUITS IN THE TECHNICAL SKILLS BONUS PROGRAM

	FY 1978	FY 1979	FY 1980
EL scores			
Less than 110	2.0	.6	1.2
110-119	18.5	14.3	9.0
120 and above	79.5	85.1	89.8
	100.0	100.0	100.0
GT scores			
Less than 110	3.3	2.0	3.4
AFQT scores			
Less than 50	.5	.7	.9
50-64	11.3	11.7	9.7
65-92	68.1	66.6	67.7
93-100	20.1	21.0	21.7
	100.0	100.0	100.0

TABLE L-2

EDUCATION LEVELS FOR RECRUITS IN THE TECHNICAL SKILLS BONUS PROGRAM

Levels	FY 1978	FY 1979	FY 1980
College	.9	.9	1.1
Less than high school	.8	.4	2.2
High school diploma	92.0	88.4	85.7
GED	.5	.3	.2
High school certificate	.0	2.5	3.0
Post high school	5.8	7.5	7.8
Total	100.0	100.0	100.0
Total number	841	934	953

TABLE L-3

RACE AND SEX OF RECRUITS IN THE
TECHNICAL SKILLS BONUS PROGRAM

	FY 1978	FY 1979	FY 1980
Race			
Black	5.7	5.9	5.2
Hispanic	2.0	2.4	1.0
Other	1.0	1.2	0.7
White	91.3	90.5	93.1
Sex			
Male	94.6	93.9	93.7

TABLE L-4

SEPARATION RATES AND TIMING OF SEPARATION
FOR RECRUITS IN THE TECHNICAL SKILLS BONUS PROGRAM

	FY 1978	FY 1979	FY 1980
Separation rates			
Not separated	82.3	85.4	91.0
Separated	17.7	14.6	9.0
Timing of Separation			
Within 3 months	33.3	44.6	66.7
3 months to 1 year	17.5	24.0	22.2
1- to 1-1/2 years	20.9	18.4	11.1
1-1/2- to 2 years	8.5	8.9	-
2 years or later	19.8	4.1	
Total	100.0	100.0	100.0
Boot camp graduation	93.1	91.8	93.5

TABLE L-5

MARGINAL RESULTS FOR BOOT CAMP GRADUATION AND FOR SURVIVAL THROUGH MARCH 1981 FOR RECRUITS IN THE TECHNICAL SKILLS BONUS PROGRAM, FY 1980

Characteristics	Boot camp graduation	Survival
MENTAL CATEGORY		
IIA	.008	-.008
IIB	-.001	-.008
IIIA	-.013	-.012
IIIB	-.046	-.046
AGE	-.011[a]	-.010
DELAYED ENTRY TIME	.0001	.0002[a]
RACE/ETHNIC		
BLACK	-.073[a]	-.060
HISPANIC	.053	.069
FEMALE	-.084[a]	-.173[a]
MARRIED	-.023	-.053
EDUCATION		
COLLEGE	.081	-.044
CERTIFICATE	.023	.034
POST HIGH SCHOOL	.072[a]	.030
OTHER EDUCATION	-.062	-.045
PERCENT WHO SURVIVED	.935	.909

[a]Significant at the 5 percent level.

TABLE L-6

TEST SCORES FOR RECRUITS IN THE COMBAT ARMS BONUS PROGRAM

	FY 1978	FY 1979	FY 1980
AFQT scores			
Less than 30	0.0	.1	.2
31-49	40.2	35.4	33.7
50-64	30.8	33.3	33.6
65-100	29.0	32.3	32.5
	100.0	100.0	100.0
GT scores			
Less than 90	4.6	1.6	1.0
90-99	32.8	30.9	30.4
100-109	21.2	21.5	23.3
110-119	23.6	27.5	26.9
120-129	12.0	12.6	13.2
130+	5.8	5.9	5.2
	100.0	100.0	100.0

TABLE L-7

EDUCATION LEVELS FOR RECRUITS IN THE COMBAT ARMS BONUS PROGRAM

Levels	FY 1978	FY 1979	FY 1980
College	.6	.7	.6
Less than high school	2.6	2.2	4.6
High school diploma	90.8	83.4	81.2
GED	2.7	4.4	5.4
High school certificate	0.5	6.3	3.6
Post high school	2.8	3.0	4.6
Total	100.0	100.0	100.0
Total number	2,03	1,943	2,001

TABLE L-8

RACE OF RECRUITS IN THE COMBAT ARMS BONUS PROGRAM

	FY 1978	FY 1979	FY 1980
Race			
Black	18.8	16.5	12.2
Hispanic	5.3	4.5	4.3
Other	1.8	1.2	1.9
White	74.1	77.8	81.6

TABLE L-9

SEPARATION RATES AND TIMING OF SEPARATION FOR RECRUITS IN THE COMBAT ARMS BONUS PROGRAM

	FY 1978	FY 1979	FY 1980
Separation rates			
Separated	22.7	15.6	12.7
Not separated	77.3	84.4	87.3
Timing of Separation			
Within 3 months	38.1	46.8	76.0
3 months to 1 year	13.7	17.3	19.2
1- to 1-1/2 years	14.2	17.3	4.8
1-1/2 to 2 years	12.8	13.5	-
2 years or later	21.2	5.1	-
Total	100.0	100.0	100.0
Boot camp graduation	89.5	91.4	89.7

TABLE L-10

MARGINAL RESULTS FOR BOOT CAMP GRADUATION AND FOR SURVIVAL THROUGH MARCH 1981 FOR RECRUITS IN THE COMBAT ARMS BONUS PROGRAM, FY 1980

Characteristics	Boot camp graduation	Survival
MENTAL CATEGORY		
IIA	-.052	-.086[a]
IIB	-.024	-.036
IIIA	-.024	-.025
IIIB	-.051	-.060[a]
IV - V	.074	.087
AGE	-.0147[a]	-.019[a]
DELAYED ENTRY	.0002[a]	.0003[a]
RACE/ETHNIC		
BLACK	.035[a]	.032
HISPANIC	.067[a]	.071[a]
MARRIED	-.089[a]	-.157[a]
EDUCATION		
CERTIFICATE	-.001	-.012
POST HIGH SCHOOL	-.028	-.012
GED	-.001	-.034
OTHER EDUCATION	-.016	-.020

[a]Significant at the 5 percent level.

TABLE L-11

BONUS PAYMENTS RECORDED BY DATE

Date	TB	CB
Prior to FY 1980	286	368
FY 1980	632	1,765
FY 1981	476	1,488
	1,394	3,621

TABLE L-12

PROGRAM OF RECRUITS WHO RECEIVE BONUS PAYMENTS

	Bonus received	
Code	TB	CB
TB	1,319	-
CB	-	3,510
OPEN	14	52
OTHER	61	59
	1,394	3,621
Incorrect Codes	5.4%	3.2%