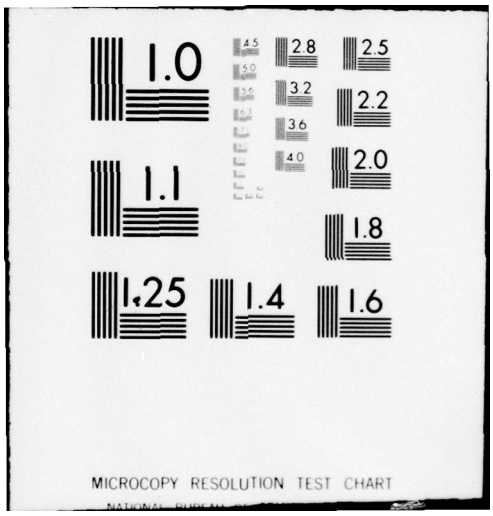
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September 1979

FORECASTING ENLISTED SUPPLY: PROJECTIONS FOR 1979-1990

Richard L. Fernandez

AD A077190

A Rand Note

prepared for the

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE/MANPOWER, RESERVE AFFAIRS AND LOGISTICS

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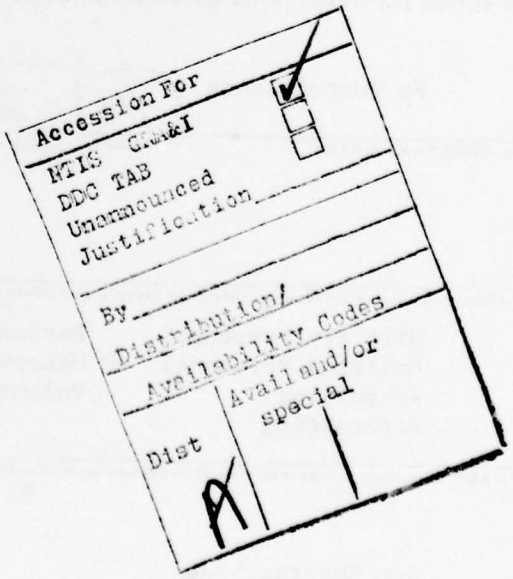
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Reports on projections of the supply of high quality male enlistees to each of the four military services which were prepared for the Office of the Assistant Secretary of Defense -- Manpower, Reserve Affairs, and Logistics. Supply equations are estimated using monthly data from the 1970s. The projections derived from them -- broken down by service, mental category, and economic assumptions -- show steady and substantial declines through the end of the next decade. The methodology followed in the study is detailed, and complete listings of the data employed are included. (Author)



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FORECASTING ENLISTED SUPPLY: PROJECTIONS FOR 1979-1990

Richard L. Fernandez

A Rand Note

prepared for the

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE/MANPOWER,
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PREFACE

This note was prepared as part of Rand's Manpower, Mobilization & Readiness Program, sponsored by the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, & Logistics)--OASD(MRA&L). Manpower issues are assuming an ever greater importance in defense planning and budgeting. This studies program is developing broad strategies and specific solutions for dealing with present and future defense manpower problems, including new methodologies for examining broad classes of manpower problems and specific, problem-oriented research. In addition to providing analysis of current and future manpower issues, this studies program will contribute to a better general understanding of the manpower problems confronting the Department of Defense.

The note reports the results of research undertaken to assist OASD (MRA&L) by projecting the supply of "high quality" males to the various military services. It expands on similar but unpublished work done by Rand in 1978 and provides documentation of the procedures followed in both studies. Because timely preparation of the projections was imperative, this study relied heavily on established methodologies, leaving substantial refinements for future research.

The projections given here were reported to OASD (MRA&L) in April 1979 and were incorporated into that office's review of the services' Program Objective Memoranda (POM).

SUMMARY

In the 1980s the United States will experience a significant decline in the sizes of the population cohorts initially entering the full-time work force from what they have been during the last decade. As large employers of young workers, the military services must be concerned about this decline. Because the services rely almost entirely on a quite narrow age group for their new recruits and are constrained to promote only from within, their concern is more acute than that of most civilian employers. As a result, they face the possibility not only of severe difficulties in recruitment but of broader personnel management problems as well.

The study reported on here examines those groups of recruits that the services have been most interested in attracting and for which accession levels have been limited by the available supply rather than by service policies: i.e., nonprior service (NPS) male high school diploma graduates (HSDG) in the three highest mental categories. Category IV and non-high school graduate volunteers will probably continue to be available, as they have been in the past, in greater numbers than the services wish to accept.

Supply functions are estimated using monthly data from July 1970 to September 1978. Separate functions are estimated for each of the four services and in each of three mental category groupings: I and II, IIIA, and IIIB. In addition, a second set of supply functions for categories I and II is estimated. They measure, without attempting to explain, the very obvious decline in enlistments in that group that took

place in FY78. In each function the ratio of enlistments to the available population pool is postulated to depend upon the level of military pay relative to pay in the civilian sector, the number of production recruiters employed by the particular service, and the youth unemployment rate.

The supply functions differ from those of other recent researchers in the area (e.g., Fechter, 1978; Grissmer, 1978; Cooper, 1977) in allowing for a distributed lag effect of unemployment on enlistments. This difference probably accounts for the relatively large effect of unemployment found here. Also somewhat unusual is the inclusion here of a measure of recruiting effort. It is impossible, unfortunately, to identify the effects of pay and recruiters separately because the major change in the services' recruiting efforts took place at approximately the same time as the large AVF pay increase. The inclusion of the recruiter variable does, however, result in an unequivocal decline in the estimated effect of pay, suggesting that previous researchers who have ignored recruiting efforts may have biased their estimated pay effects upward.

Projections for fiscal years 1979 through 1990 are developed from the estimated supply functions. The recruiter and pay variables are assumed to take on their average values during FY78, and three scenarios are postulated for the youth unemployment variable. The youth unemployment scenarios are based on alternative projections for the aggregate unemployment rate developed by the Congressional Budget Office (1979a, 1979b), with the translation from the aggregate to youth rate made based on the relationship between the two during the 1970s. This procedure introduces the possibility of significant error in the

enlistment projections, because the relationship that held in the 1970s may be altered by the decline in the sizes of the youth cohorts that will occur in the 1980s.

The enlistment supply projections show the expected declines in enlistments in all categories and to all the services. The decline is particularly severe for category I and II enlistments in the "Case B" projections, which are based on the assumption that whatever factor caused the low enlistment levels for this group in FY78 will not be reversed. Army accessions of HSDGs in mental categories I and II, for example, are projected in Case B and under the moderate growth scenario to fall in 1984 to only 45 percent of their numbers in the Army's best recruiting year, FY76. The corresponding figure for category III enlistments is 83 percent, and actual enlistment levels could be even higher if the Army's policies have limited accessions of category IIIB HSDGs in the past.

The projections are subject to the possibility of substantial error. Some of this error is quantified in the reported standard errors of projections. These are based on the estimated supply equations used in producing the projections and embody both the errors in identifying the structural parameters and the unexplained variation of the dependent variable. Also important, however, is the uncertainty about the future relationship between the aggregate and youth unemployment rates. As a result of these two sources of possible error, predicting enlistment levels in the 1980s with high accuracy is impossible.

Two areas for future research are suggested by the results of this study. First, to measure the effectiveness for increasing the supply of high quality enlisted men of the two policy variables considered here--

pay and recruiters--studies should be made of cross-sectional data in which independent variation of these variables can be observed. Time series analysis of their effectiveness is hampered by the limited variation that both variables have shown in this decade, apart from the large simultaneous increases in 1971 and 1972.

Second, a better understanding is needed of the links between unemployment in the aggregate and the unemployment of young men. How that link will be affected by the decline in the sizes of the youth cohorts through the 1980s should be explored more fully.

Whatever the results of such research, the principal conclusions of this study should stand. Enlistments of high quality males will decline steadily through the late 1980s unless some major and as yet unforeseen event occurs that significantly raises the basic propensity of young men to enter the military. A return of the youth unemployment rate to a level near its post-draft high would be one such event, although this is unlikely and in any event would not completely offset the decline. The greatest fall in enlistments relative to what they were in 1976 and 1977 will occur among highest quality youths. This drop first became evident in FY78 and shows no sign of reversal.

ACKNOWLEDGMENTS

Many people gave invaluable help during this study and in the preparation of this note. Special thanks go to Dr. Thomas Sicilia (OASD/MRA&L) for his support and encouragement. Mr. Louis Pales of the Defense Manpower Data Center provided the accessions data used here and generously assisted in resolving anomalies in the data.

Former Rand colleague Richard Cooper generously gave his time for general discussion of military manpower issues and helped with specific details of data and methodology. Other Rand colleagues also helped greatly: Cheryl Cook offered constant encouragement and many useful comments on preliminary drafts; the previous work of David Grissmer formed the basis for this study; Gaineford J. Hall bent his statistical talents to the derivation of the appropriate formulas for the calculation of the standard errors of projection. Finally, James Hosek's comments on an earlier draft led to a significant reorganization.

Naturally, any remaining errors are the author's responsibility.

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I. INTRODUCTION

In the 1980s the United States will experience a significant decline in the sizes of the population cohorts initially entering the full-time work force relative to what they have been during the current decade. This decline will probably force difficult adjustments to be made by sectors of the civilian economy that traditionally have employed large numbers of young, inexperienced workers. The personnel management problems confronting the military services, however, will be particularly severe. The reasons for this are obvious; the services promote only from within and depend almost entirely on a quite narrow age group for their new recruits.

Given the problems the services can expect, it is particularly important that manpower policy planners in the Department of Defense have reliable projections of enlisted accessions under a continuation of current pay and recruiting policies.

This note reports the results of research undertaken to project accessions of high quality nonprior service males to the various services. Section II describes the methodology and data used in this analysis. A simple model of the supply of enlisted recruits has been developed and fitted to data from the recent past. Section III presents the projections. As might be expected, they show substantial and steady declines in enlistment levels through the late 1980s, especially for the highest quality recruits. Section IV discusses the considerable uncertainty these projections leave about the true levels of accessions, giving some reasons why such uncertainty is inevitable. Finally,

Section V analyzes the limitations of the current approach and suggests some directions for future research.

II. METHODOLOGY

Since the end of the draft, volunteers to the military services have in general been in excess supply. As a result, the services have been able to impose quality standards on potential recruits, taking all available volunteers of high ability and educational achievement and rejecting--in degrees that have varied across services and over time--some of the less able and less educated volunteers. Whether this situation of excess total supply will continue to prevail in the 1980s is not clear. The services have a particular interest in knowing the numbers of high quality recruits they can expect in the future, because of the skill requirements of many military jobs and because of evidence that members of certain categories of low quality recruits are particularly prone to receive disciplinary action[1] and to leave the military before the completion of the first term. The first-term attrition rate for non-high school diploma graduate males, for example, has been twice that for graduates during the 1970s.[2] Thus, for the pragmatic reason that supply relationships are unobservable for low quality recruits and because of particular service concerns, this study exclusively examines nonprior service (NPS) high school diploma graduate

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[1] "Analysis of Disciplinary Actions Affecting First Term Negro and Caucasian Servicemen," Directorate for Manpower Research, Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs), April 1971, cited in Cooper (1977), p. 131.

[2] Department of Defense (1978), p. 68.

(HSDG) male[1] volunteers in mental categories I, II, and III.[2]

Supply functions are estimated for these volunteers for each of the four services in each of three mental category groupings: I and II, IIIA, and IIIB. Separate functions are estimated for IIIAs and IIIBs because there is evidence that for some of the services--particularly the Air Force--and at some times, accessions of IIIB (and possibly even IIIA) recruits have been limited by service policies.

ENLISTMENT SUPPLY MODEL

For supply limited groups the number of voluntary enlistments into a particular service in a given month, relative to the available youth population pool, is postulated to depend upon the ratio at that time of military to civilian wages, on the number of recruiters on production for the service in that month, on current and past values of the youth unemployment rate, and upon certain seasonal factors. This is expressed in Eq. (1), the basic form of the model to be estimated:

$$E_t/POOL_t = a_o + \sum_{i=1}^{11} a_i \, MDUM_{i,t} + b(MP_t/CP_t) + c \, RECR_t + \sum_{j=o}^{11} d_j \, U_{t-j} + \varepsilon_t \qquad (1)$$

---

[1] No attempt is made in this study to examine the supply of female recruits. Although high quality female accessions may have been supply limited in recent years, available data is as yet too meager to enable meaningful projections to be made of their future supply.

[2] These categories comprise the top 70 percent of all youths as determined currently by scores on the general aptitude portions of the Armed Services Vocational Aptitude Battery (ASVAB) test. The exact breakdown, in percentiles, is: Category I--93 to 100; II--65 to 92; IIIA--50 to 64; IIIB--31 to 49.

where:

E_t = voluntary enlistments in period t;

$POOL_t$ = weighted average of NPS male civilians aged 17 to 21 at time t, the weights being the proportions of total DoD enlistments of each age in the post-draft years; in thousands;

$MDUM_{i,t}$ = indicator variables for month 1 (January) through 11 (November), taking on the value 1 if period t falls on month i, and zero otherwise;

MP_t = average first year regular military compensation at time t for enlistees with less than two years of service;

CP_t = average weekly earnings in the total private economy at time t, seasonally adjusted;

$RECR_t$ = number of production recruiters for the particular service at time t;

U_t = unemployment rate for males, aged 16 to 19, at time t, seasonally adjusted;

ε_t = random disturbance term at time t, assumed independent and identically distributed normal random variables with mean zero.

A complete description of the variables, including sources, and a justification for the choice of each, are given in Appendix B. Apparently original to this study is the adjustment of data on total male population by age to yield estimates of the NPS civilian male population, which is detailed there. The appendix also contains a table of mean values and standard deviations for each of the variables over the sample period, and complete listings of the data.

Equation (1) is only one of many possible alternative specifications of a model of military enlistments. It was not feasible in this study to explore all of these specifications. In particular, the lack in past studies of clear support for an absolute pay model, in

which the civilian and military pay variables enter separately, was taken as sufficient grounds for adopting the commonly used relative pay formulation.[1] Similarly, the selection of the enlistment rate as the dependent variable, rather than the level of enlistments, follows the tradition of most previous researchers (Fechter, 1970; Grissmer et al., 1974, Amey et al., 1976; Cooper, 1977). On both of these points, however, future research is indicated.

The apparently novel introduction of a distributed lag formulation for the unemployment variable is indicated by several factors. If for no other reason, a lagged effect might be expected because of the existence of the Delayed Entry Program (DEP), through which an individual can commit himself to active duty up to one year before he actually "ships out." In this study the enlistment is counted at the later date. In addition, however, it is likely that a prolonged period of unemployment will have a greater effect on the individual than a single month of unemployment. He may also be influenced by what he perceives to be the likelihood of finding or keeping a civilian job in the future, and this perception probably would be affected strongly by the level of unemployment in the recent past.[2]

---

[1] Typically, the hypothesis of symmetric response to the two pay variables is not explicitly tested. See, e.g., Fechter (1970). For examples of the use of the relative pay model, see Grissmer (1978) and Cooper (1977).

[2] Similar arguments could also be raised with respect to the effects of relative pay and recruiting effort, but a peculiar feature of the available measures of these two factors--their high degree of collinearity over the sample period--renders identification of such lagged effects all but impossible. Consideration of these effects might suggest the need for an asymmetrical treatment of civilian and military pay, because the exact magnitudes of changes in the latter were often known well in advance during the early 1970s.

The lagged effect of unemployment is estimated without any constraint on the form of the lag. In estimating equations with lagged independent variables, constraints are often imposed to reduce the total number of coefficients to be estimated and to improve the precision with which individual lag coefficients are estimated.[1] In this study, however, the total length of the lag assumed is quite short--only one year--because the individuals of interest are for the most part recent high school graduates with little labor market experience. Thus the gain in degrees of freedom from using, for example, the Almon polynomial lag technique is small. In addition, because there is no interest in this study in testing hypotheses about the precise pattern of the lagged effect, the precision of individual coefficient estimates is unimportant. Finally, the imposition of a priori constraints may result in a serious misspecification,[2] which is particularly important to avoid if accurate projections are to be obtained.

The linear form was chosen to make feasible the calculation of the standard errors (discussed in the following sections), which are for annual totals. As a practical matter, the projections are not greatly affected by the functional form chosen, and there are no compelling theoretical grounds for choosing any particular specific form. Fechter (1970) exprimented with a number of forms and most recently (1978) has used the logistic function, as has Cooper (1977). Grissmer (1978) used both linear and constant-elasticity forms, finally noting that the resultant elasticity estimates "generally were of the same magnitude"

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[1] See, for example, Almon (1965).

[2] For a good discussion of this point, see Schmidt and Waud (1973).

(p. 109). If projections were to be made based on values of the independent variables (pay, recruiters, unemployment) well outside the rather limited ranges over which those variables have varied in the past, then the choice of the functional form would be of extreme importance. In this case, however, the assumed future values of the variables do not differ greatly from their mean values during the estimation period. Thus the linear approximation to the true structural relationship and the assumption of normally distributed random errors are not likely to cause significant distortions.

Equation (1) clearly does not represent a complete model of the decision to enlist in the military. Individuals may also consider the opportunity to obtain training in skills transferable to civilian jobs (investment in human capital) and the availability of post-service educational benefits (forced savings for future investment in human capital). They may also view the three or four years of steady employment, rather than the series of jobs they might go through as inexperienced workers in the civilian sector, as a good indicator to future potential employers of their reliability (investment in a signal).[1] As these considerations suggest, and as the small proportion of first term enlisted men who ultimately pursue military careers makes clear, the decision to enlist in the military should not be viewed as a once and for all occupational choice. Rather, it must

---

[1] The concept of a labor market signal--an observable personal characteristic which can be obtained at cost and whose presence serves as an indicator to potential employers of an unobservable and unchangeable characteristic of the individual--is explored in a growing literature to which Spence (1973) is a seminal contribution.

properly be examined in a life cycle context, with the full effect of the decision on the individual's career path considered. No attempt has been made to employ such a model here, however, because of the lack of readily available measures of the indirect benefits of military service and because of the very limited variation that such measures, were they available, would have shown over the post-draft years.

Equation (1) represents a very simple model of the determination of enlistment rates over time, based on theories of labor supply. With the exception of the lagged formulation of the effect of unemployment, it follows the work of Fechter (1970, 1978), Grissmer (1978), and Cooper (1977), among others.

ESTIMATION RESULTS

Equation (1), with some modifications, was fitted to monthly data for the period July 1970 to September 1978 (additional early observations were available for the unemployment rate) using the Cochrane-Orcutt iterative technique. Separate regressions were run for each of the four services (Army, Navy, Marine Corps, and Air Force), and in each of three mental category groups (I and II, IIIA, and IIIB).

Two modifications were made: (1) the recruiter variable was omitted from the Navy and Air Force equations for category I and II enlistments, and (2) a second set of regressions was run for category I and II enlistments to each of the services with an indicator varible for FY78 included. The former modification was made because improbably large coefficients for the recruiter variable were found in these cases in preliminary regressions. The inclusion of the recruiter variable also resulted in quite unreasonable projections, and in three of the four regressions (two services, with and without the FY78 indicator) the

associated relative pay coefficient was negative. As might be expected, removing the recruiter variable increased the estimated effect of relative pay (and made it positive) in every case.

The FY78 indicator variable was added for the additional category I and II regressions because the equations estimated in the basic form for this group exhibited consistently negative residuals during the FY78 period. Although this could be due merely to chance, the consistency of the phenomenon across services suggested that a change had occurred in the underlying structural relationships. Several factors may explain the decline in enlistments, of which the most promising are: (1) the elimination of GI Bill educational benefits for those enlisting after December 31, 1976, the full effect of which would not be felt until the last DEP recruit to enter before January 1977 began active duty in late FY77; and (2) the decline in the number of available "attractive" training slots when the services--particularly the Army--reduced total accession requirements in FY78. Both explanations would predict that the greatest declines in enlistments would take place in the higher mental categories.

Unfortunately, no data were available that would permit a test of either hypothesis, or of others that might also be suggested. It is probably impossible, in any event, to distinguish among any of the possible explanations, because they all depend upon the effect of a one-time change in a service or outside policy that has not changed at any other time during the post-draft years.

If a structural change has taken place, however, ignoring it would seriously bias the projections. Accordingly, two separate regressions were run for each service for category I and II accessions; one in the

basic form (Eq. (1)) and the second with an indicator variable included that takes the value 1 in FY78 and is zero otherwise. In all four services, the estimated coefficient of this variable is negative and statistically significant at any reasonable level of confidence.

The errors of all the preliminary regressions exhibited positive serial correlation; in no case did the Durbin-Watson statistics exceed 1.1. In the presence of autocorrelated errors, ordinary least squares (OLS) parameter estimates are unbiased but inefficient (i.e., the sampling variances of the OLS parameter estimates are larger than can be obtained using some other unbiased estimator). More important--for the efficiency gain in using a more complicated estimation procedure is probably small (Rao and Grilliches, 1969)--the standard OLS formulas for the variances of the estimated parameters are incorrect when the errors are autocorrelated, substantially understating the true sampling variances. One of the purposes of this study is to provide indications of the degree of precision of the projections produced, so such bias in the estimated covariance matrix cannot be tolerated.

To solve this problem, the 16 regressions were run using what is commonly called the Cochrane-Orcutt iterative technique.[1] If the true value of the first-order autocorrelation coefficient is known, the Cochrane-Orcutt technique yields unbiased estimates of parameter variances. In general, however, and in this case in particular, the coefficient must be estimated. The resulting sample variances of the parameters are still biased, but less so than those of OLS (Park and

[1] Cochrane and Orcutt (1949); see also Johnston (1972), p. 262.

Mitchell, 1979). The standard errors reported below for both the regression parameters and the projections should, therefore, be taken as lower bounds.

The estimated supply equations are reported in Tables 1 through 4. For simplicity, the constant and seasonal terms are omitted, and the lagged unemployment coefficients have been summed to yield the total effect of youth unemployment on accessions. For comparison with other studies, the implied elasticities are presented in Table 5. In the computation of these, the pay and recruiter variables were set to their average levels during FY78, and the unemployment variable to its mean over the entire estimation period.

Most noteworthy of the results are the quite large unemployment elasticities. In contrast, Grissmer (1978) found an elasticity for DoD total category I and II high school graduates of only .485, and for category III high school graduates of .223. Cooper (1977) found an even lower elasticity for category I-III high school graduates: only 0.19.[1] One fairly credible explanation for the difference is that, as postulated in this study, the full effect of unemployment on accessions is not felt in a single period. If this is true, then including only a single current or lagged value of the unemployment variable in the estimated supply function would result in an understatement of that effect.

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[1] Cooper's elasticity is computed at the average AVF levels for pay and recruiters, and the average over his study period for unemployment, while Grissmer used a form for the enlistment rate function that assumes constant elasticities. It should be noted that Cooper used semi-annual observations, so Grissmer's results from monthly data are more nearly comparable to those of the current study.

Table 1

ARMY REGRESSION COEFFICIENTS

Mental Category	Mean of Dependent Variable	Recr.	Pay	Unem.	FY78 Dummy	RHO[a]	R^2
I & II	1.128	.0190[b] (.0861)[c]	26.40 (16.42)	16.49 (26.58)	-504.1 (98.4)	.4950	.8963
I & II	1.128	-.0029 (.1181)	24.08 (19.88)	34.68 (37.55)		.7458	.8719
IIIA	.772	.0666 (.0579)	11.14 (10.81)	-2.27 (13.62)		.5718	.9145
IIIB	1.019	.0914 (.1121)	11.51 (19.16)	51.98 (34.41)		.7299	.9105

[a] First order autocorrelation coefficient.

[b] All coefficients x 1000.

[c] First order autocorrelation coefficient.

Table 2

NAVY REGRESSION COEFFICIENTS

Mental Category	Mean of Dependent Variable	Recr.	Pay	Unem.	FY78 Dummy	RHO	R^2
I & II	1.153		19.28 (6.69)	45.04 (14.00)	-286.6 (75.6)	.4358	.8940
I & II	1.153		14.61 (9.91)	49.56 (21.78)		.6366	.8795
IIIA	.631	.1259 (.0628)	-.30 (7.60)	29.12 (11.94)		.6282	.9187
IIIB	.560	.1235 (.0727)	4.52 (8.82)	27.83 (13.76)		.6213	.9136

Table 3

MARINES REGRESSION COEFFICIENTS

Mental Category	Mean of Dependent Variable	Recr.	Pay	Unem.	FY78 Dummy	RHO	R^2
I & II	.383	.1343	0.62	31.34	-68.5	.4471	.9192
		(.1060)	(5.09)	(9.25)	(33.6)		
I & II	.383	.0918	2.30	31.88		.5074	.9149
		(.1110)	(5.34)	(6.93)			
IIIA	.269	.1682	-2.85	14.08		.6519	.9190
		(.0931)	(4.37)	(7.05)			
IIIB	.315	.1285	-.51	10.52		.8269	.9204
		(.1300)	(5.69)	(14.72)			

Table 4

AIR FORCE REGRESSION COEFFICIENTS

Mental Category	Mean of Dependent Variable	Recr.	Pay	Unem.	FY78 Dummy	RHO	R^2
I & II	1.089		8.27	40.84	-310.5	.4556	.7415
			(8.07)	(16.93)	(90.8)		
I & II	1.089		9.66	42.45		.6275	.7132
			(11.35)	(24.89)			
IIIA	.658	.0617	7.68	6.56		.5441	.7559
		(.1684)	(7.59)	(15.05)			
IIIB	.547	.6966	-19.64	-20.45		.5556	.8174
		(.1856)	(8.34)	(16.62)			

Table 5

ELASTICITIES

	RECR	PAY	UNEM
Mental Categories I & II (Case A)			
Army	-.0112	.8059	.5153
Navy		.4783	.7204
Marines	.4250	.2268	1.3951
Air Force		.3349	.6533
Mental Categories I & II (Case B)			
Army	.0733	.8835	.2450
Navy		.6312	.6547
Marines	.6217	.0611	1.3714
Air Force		.2867	.6285
Mental Category IIIA			
Army	.3752	.5447	-.0493
Navy	.5978	.0179	.7735
Marines	1.1086	-.4000	.8773
Air Force	.1435	.4406	.1671
Mental Category IIIB			
Army	.3901	.4264	.8549
Navy	.6607	.3047	.8329
Marines	.7233	-.0611	.5597
Air Force	1.9484	-1.3554	-.6266

Also interesting is the statistical insignificance of the coefficients for both pay and recruiters. As can be seen in Figure 1, for each of the four services these two variables were highly collinear over the estimating period, exhibiting large increases in FY72 and little variation during the rest of the period. The insignificant (and sometimes negative) coefficients are a direct result of this phenomenon: However great the joint effect on accessions of recruiters and relative pay may have been, reliably distinguishing their separate effects is not possible.

Finally, the rather large negative effect of unemployment on Air Force category IIIB accessions should be noted. As was pointed out at the outset, the services' requirements may have influenced accession levels in the lower mental categories. This would seem most likely for the Air Force, which reputedly has had the least difficulty meeting accession goals. The unemployment coefficient for Air Force IIIBs offers evidence that accessions of this group have, indeed, been demand limited. Apparently, high youth unemployment levels, by causing fairly large numbers of category I and II high school graduates to enlist, have led the Air Force to limit the number of IIIBs accepted.

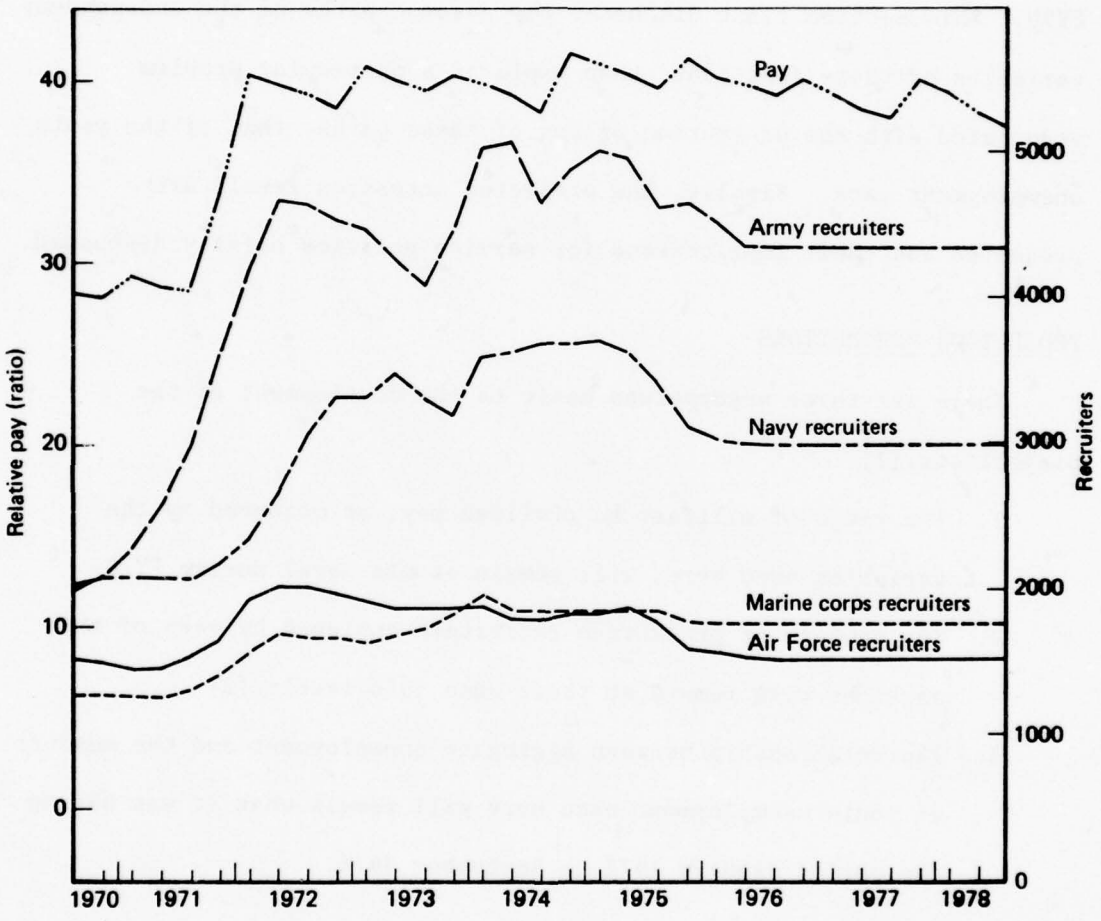


Fig. 1—Relative pay and production recruiters (quarterly averages)
1970: 3 – 1978: 3

III. PROJECTIONS

The estimated supply functions presented in Section II have been used to project accession levels on an annual basis for FY79 through FY90. This section first discusses the assumed paths of the independent variables of those functions, then explores a particular problem associated with the projection of one of these paths, that of the youth unemployment rate. Finally, the projected accession levels are presented and their implications for service policies briefly discussed.

PROJECTION ASSUMPTIONS

There are three assumptions basic to the development of the projections:[1]

1. The ratio of military to civilian pay, as measured by the variables used here, will remain at its level during FY78.
2. The numbers of production recruiters employed by each of the services will remain at their June 1976 levels.[2]
3. The relationship between aggregate unemployment and the measure of youth unemployment used here will remain what it was during the period January 1972 to September 1978.

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[1] An additional assumption, necessary for the purpose of projecting the size of the NPS population pool, is that the proportions of the total male population of each age (17 through 21) who enlist each year will remain as they were during fiscal year 1976. Although this might seem unrealistic, as a practical matter the proportions assumed have very little effect on the resultant enlistment projections. See Appendix B for a more complete discussion of this point.

[2] This was the last month for which data on recruiters were available to us when these projections were made.

The first two of these assumptions are straightforward and probably not unreasonable. Given the imprecision with which the separate effects of recruiters and pay are identified in the estimated supply functions, any significant departures from these assumptions would lead to projections of dubious reliability.

The third assumption is more difficult to justify. It is necessary because forecasts of the likely course of the economy typically are couched in terms of the aggregate unemployment rate. Whether that rate will continue to be related to the youth unemployment rate as it has been in the 1970s depends upon a complex set of interacting forces related to the expected decline, in both relative and absolute terms, in the size of the youth cohort in the 1980s. On the one hand, this decline can be expected to improve the opportunities of youths for jobs of the types which they typically have held. Such an improvement should, other things being held constant, reduce the youth unemployment rate relative to the rate for all workers.

On the other hand, young males will feel an increase in competition for jobs of all types, both from the slightly older "baby boom" cohorts and from the ever-increasing numbers of women entering the labor force. Thus although young men may find it quite easy to find jobs in the low paying, high turnover labor market of what has come to be called the secondary sector, good jobs with attractive promotion possibilities may be even more scarce than they were for the baby boom youths. Which sector is more important in determining the entry of a young man into the military it is difficult to know: Does he enlist because he cannot find any job at all, or because the only jobs available are unattractive? Vroman (1977) has shown that tight aggregate labor

markets enhance the movement of workers from "bad" jobs (typified by retail trade in his study) into "good" jobs (typified by durable manufacturing), particularly for demographic groups other than prime age (25 to 64) white males. This suggests that an outstanding characteristic of periods of high unemployment is the scarcity of good job openings.

As these considerations suggest, there is substantial uncertainty whether the youth unemployment rate will bear the same relationship in the 1980s both to the aggregate unemployment rate and to the rate of military enlistments that it did in the 1970s. Although it frequently has been argued that an improving youth job picture will exacerbate the effects on enlistments of the decline over the next ten years in the size of the prime enlistment age population pool, this argument is far less compelling than it would appear to be at first glance.[1]

One approach to dealing with the uncertainty about the future relationship between aggregate and youth unemployment would be to postulate several alternative paths for the youth unemployment variable and to make projections based on each. Unfortunately, the uncertainty about the future course of aggregate unemployment is equally great. To avoid a confusing proliferation of projections, therefore, the approach of alternative scenarios has been reserved for the aggregate unemployment rate.

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[1] There can be little doubt, however, that late in the next decade, when the "slightly older" group is also small in numbers, the outlook for enlistments will be worse than the aggregate unemployment rate alone would indicate.

The source of the scenarios used here is a study by the Congressional Budget Office (1979a, 1979b). The CBO examined the effects on the economy through 1984 of three different federal spending strategies: a continuation of current real spending levels, which it called the implementation of a moderate growth target; a $25 billion cut in expenditures in 1980 and thereafter (lower growth target); and an expansionary spending strategy (higher growth target). Under these strategies, the CBO predicts aggregate unemployment rates in 1984 of 5.5, 6.9, and 4.1 percent respectively. Table 6 details these three unemployment paths.

To convert these aggregate unemployment rate scenarios to the youth unemployment rate used here, a linear regression was run (again using the Cochrane-Orcutt technique because of the evident serial correlation) employing monthly data from January 1972 to September 1978, with the following results (standard errors in parentheses):

$$SA1619 = \underset{(0.801)}{5.695} + \underset{(0.121)}{1.712}SA16P \qquad \text{R-squared} = .8853, \quad \text{Rho} = .4308\ (.1009)$$

where:

SA1619 = unemployment rate for males aged 16 to 19, seasonally adjusted,

SA16P = unemployment rate for all workers, aged 16 and over, seasonally adjusted,

Rho = estimated first-order autocorrelation coefficient.

Table 6

UNEMPLOYMENT SCENARIOS

Calendar Year	Moderate Growth		Low Growth		High Growth	
	General	Youth	General	Youth	General	Youth
1979	6.2	16.3	6.2	16.3	6.2	16.3
1980	6.8	17.3	6.8	17.3	6.8	17.3
1981	6.6	17.0	6.8	17.3	6.3	16.5
1982	6.2	16.3	6.9	17.5	5.1	14.4
1983	5.9	15.8	6.9	17.5	4.1	12.7
1984	5.5	15.1	6.9	17.5	4.0	12.5
1985	5.5	15.1	6.9	17.5	4.0	12.5
1986	5.5	15.1	6.9	17.5	4.0	12.5
1987	5.5	15.1	6.9	17.5	4.0	12.5
1988	5.5	15.1	6.9	17.5	4.0	12.5
1989	5.5	15.1	6.9	17.5	4.0	12.5
1990	5.5	15.1	6.9	17.5	4.0	12.5

This equation was used to project the path of the youth unemployment variable for each of the aggregate scenarios. A comparison of the projected paths with recent historical experience--for both aggregate and youth rates--is provided in Figure 2.

PROJECTION RESULTS

Tables 7 and 8 summarize the projection results for the moderate growth target scenario. In Table 7, the FY78 decline in category I and II enlistments is assumed to be merely a chance occurrence (Case A), while in Table 8 it is assumed to reflect a basic structural change that will not be reversed (Case B).[1] The projections for categories IIIA and IIIB are the same in the two tables.

These DoD total projections are the simple sums of the separate projections for the four services. They do not result from separate regressions for DoD as a whole. Thus Tables 7 and 8 do not include estimated standard errors, which are a unique feature of the service projections presented in full in Appendix A. Although a complete discussion of the standard errors will be deferred to the next section, they range between 6 and 16 percent of the projected accession levels (varying by service and mental category).[2] The implied confidence bands at the 95 percent level, which extend approximately two standard errors above and below the projected levels, would therefore range in

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[1] That is, the equations used to produce the category I and II projections for Case A are those presented on the first line in Tables 1 through 4. The equations used in Case B appear on the second line in these tables (with the FY78 indicator variable set equal to one).

[2] Large as these standard errors are, they do not represent all the uncertainty asssociated with the projections.

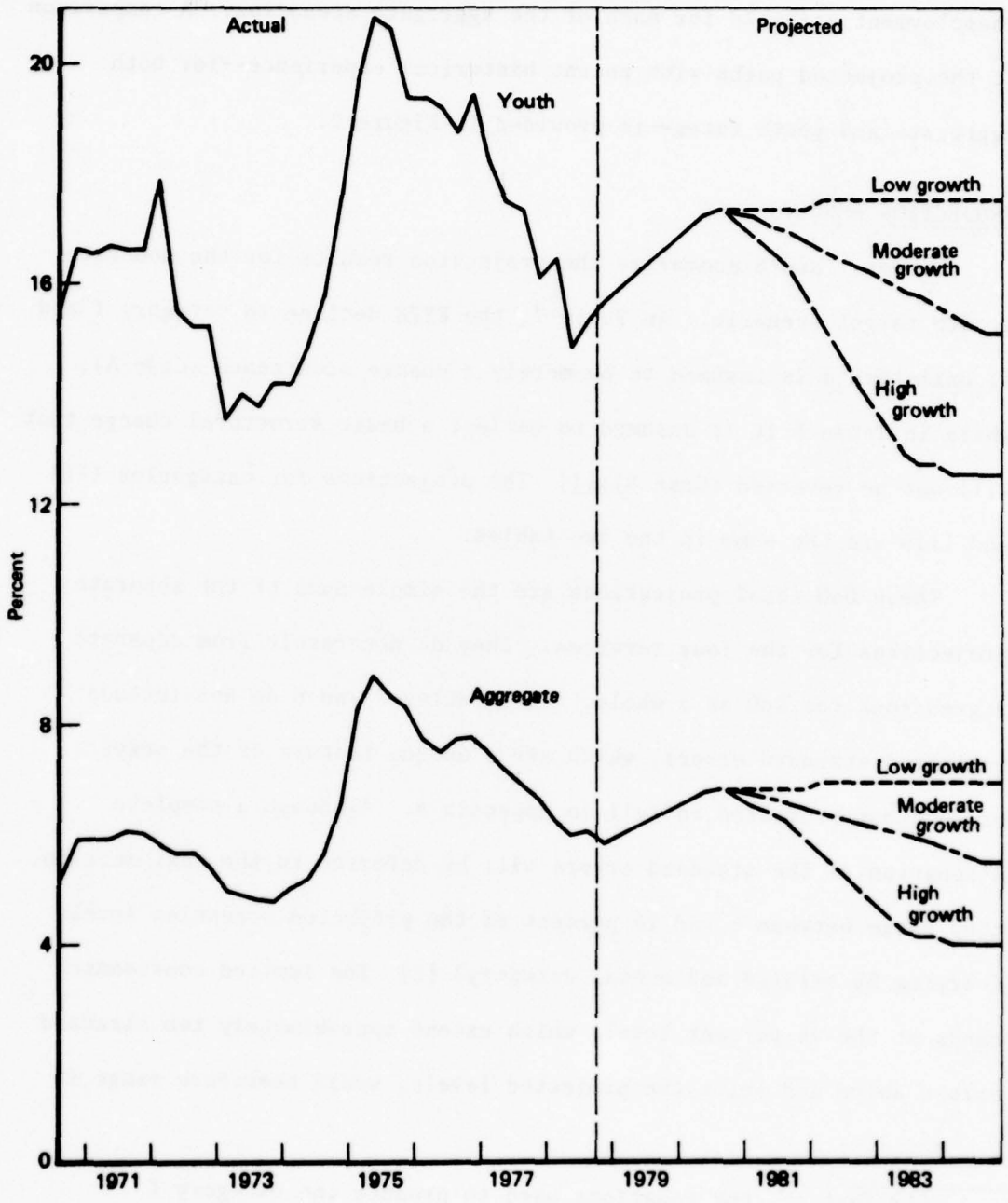


Fig. 2—Aggregate and youth unemployment rates (quarterly averages) 1970: 3 – 1984: 4

Table 7

DoD SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	87689	53705	54987	196381
1980	91564	55613	56310	213487
1981	91260	54836	57711	203807
1982	87853	52975	56704	197532
1983	83626	51022	54332	188980
1984	78301	48449	51453	178203
1985	74650	46615	48576	169842
1986	72641	45524	47076	165241
1987	71801	45004	46551	163356
1988	72116	45208	46764	164088
1989	72211	45263	46817	164291
1990	70625	44259	45767	160651

Table 8

DoD SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	63889	53705	54987	172581
1980	66959	55613	56310	178882
1981	67516	54836	57711	180063
1982	65125	52975	56704	174814
1983	61763	51022	54332	167117
1984	57631	48449	51453	157533
1985	54573	46615	48576	149765
1986	53010	45524	47076	145610
1987	52410	45004	46551	143965
1988	52648	45208	46764	144620
1989	52708	45263	56817	144788
1990	51533	44259	45767	141559

width from 24 to 64 percent of the projected levels.[1] The explanation of enlistments provided by the estimated supply functions of the previous section is simply not good enough--both because the model underlying them is probably incomplete and, more important, because of the very short period for which reliable voluntary enlistment data are available--to allow more precise projections. Despite this imprecision, the projections are at least unbiased and are probably about as good as it is currently possible to produce.

Figures 3 through 6 graphically display the projections for the individual services--again only for the moderate growth scenario--and the actual levels of accessions for FY71 through FY78. The two paths for the projection period correspond to the two treatments of FY78 for category I and II accessions, the lower area (Case B) in each figure embodying the assumption that the FY78 decline was due to a structural change that will not be reversed.

As expected, the projections show a steady decline in accession levels through the 1980s, both for categories I and II and for the I, II, and III totals.[2] The extent of the decline varies across services, because of their differing responsiveness to changes in the

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[1] A confidence band expresses, in this context, a range of values within which we can expect with a given degree of confidence the true value of accessions will fall. To take an example, the projected level of category I and II HSDG accessions to the Army in 1979 is 16,383, with a standard error of 2625. A 95 percent confidence band would, therefore, extend from 11,133 to 21,633. This means that there is one chance in 20 that accessions of this type will be less than 11,133 or greater than 21,633.

[2] It should be remembered that category IIIB enlistments were probably demand limited at some times during the 1970s. Thus the totals are less reliable than are the category I and II projections, especially for the Air Force.

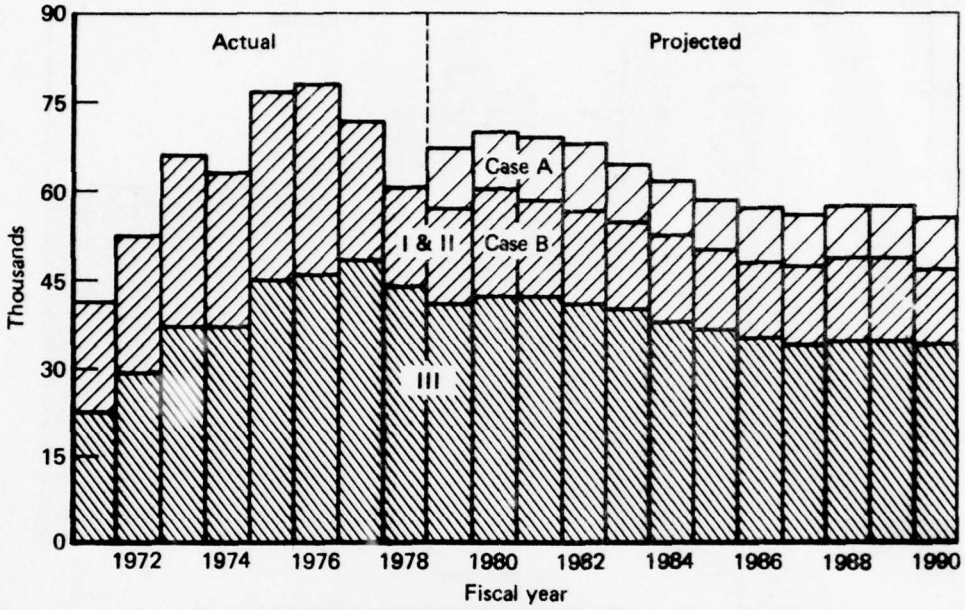


Fig. 3— Male HSDG enlisted supply – Army
Mental categories I, II, & III Moderate growth

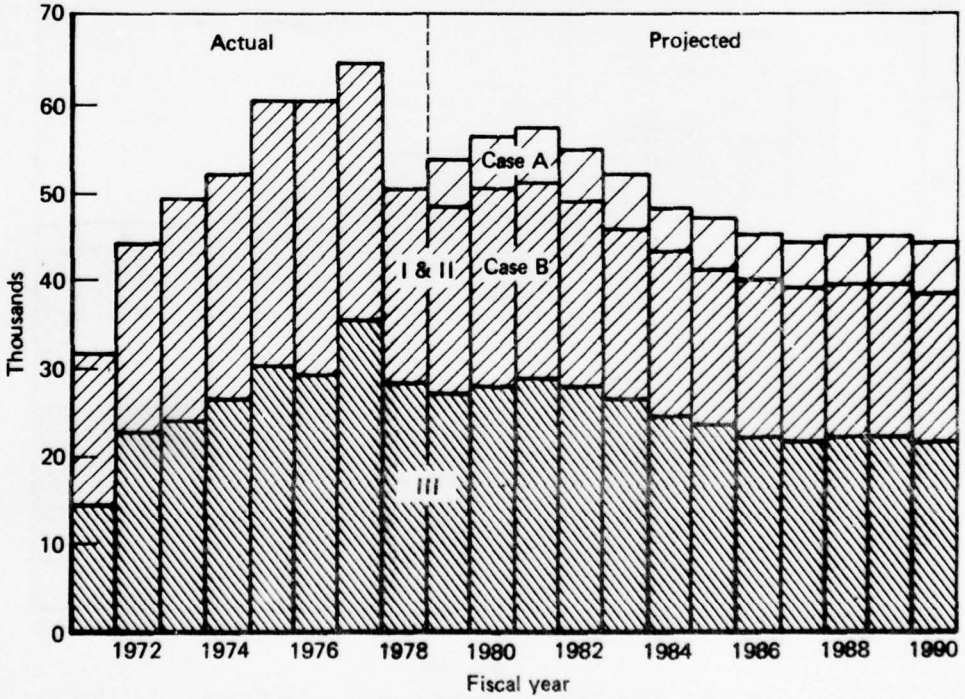


Fig. 4—Male HSDG enlisted supply – Navy
Mental categories I, II, & III Moderate growth

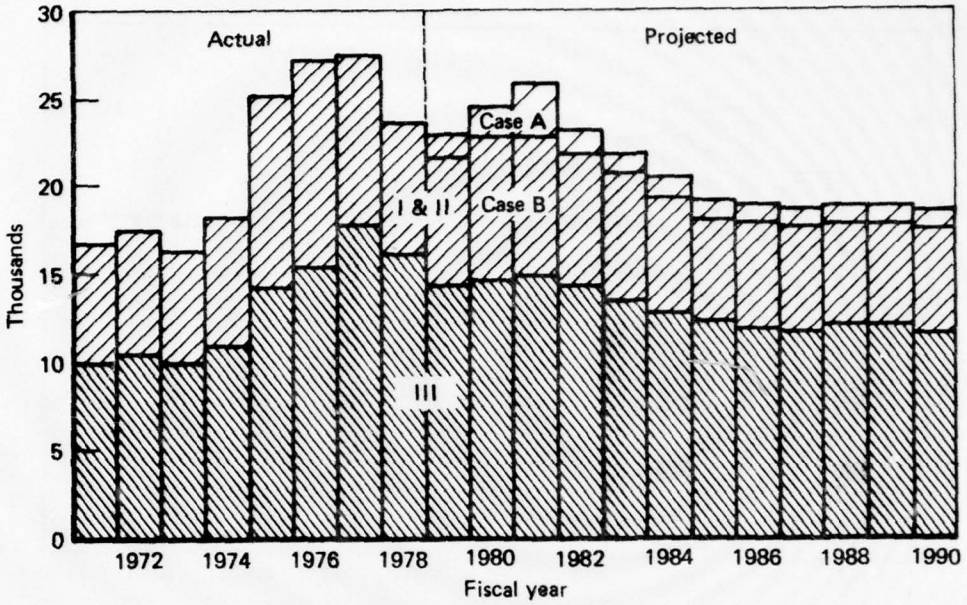


Fig. 5—Male HSDG enlisted supply – Marine Corps
Mental categories I, II, & III Moderate growth

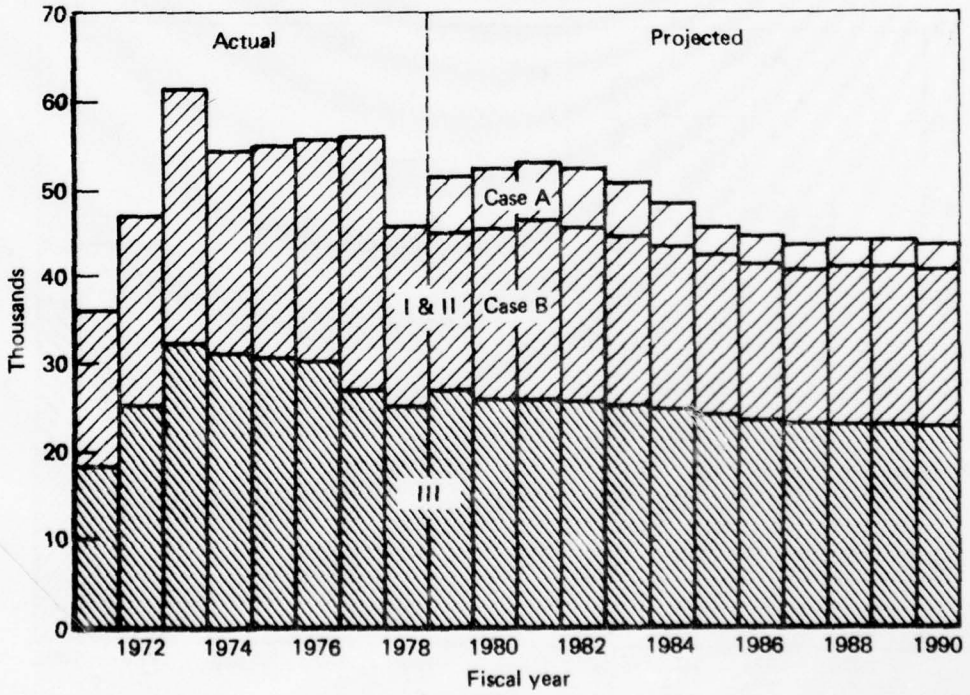


Fig. 6—Male HSDG enlisted supply – Air Force
Mental categories I, II, & III Moderate growth

unemployment rate. Under the moderate growth scenario, that rate is predicted to fall to 15.1 percent (5.5 percent for the aggregate rate) by 1984. Much greater than the decline due either to the fall in the unemployment rate or to the more certain fall in the size of the pool of enlistment prime age males is the fall in enlistments which the FY78 experience seems to indicate. The importance of that last year can be seen clearly by comparing the more optimistic of the two cases presented with the projections that result from completely discounting the FY78 experience.[1] Ignoring FY78 yields projected accessions of categories I and II that during the early 1980s average 10 percent higher for the Army, 5 percent higher for the Navy and Air Force, and 3.5 percent higher for the Marines.

Even more impressive are the differences between the two sets of projections depicted in the figures. Again using the more optimistic as the base, treating FY78 as a permanent phenomenon results in projected accession of I and IIs that are 37 percent lower for the Army, 22 percent lower for the Navy, 16 percent lower for the Marines, and more than 25 percent lower for the Air Force. Preliminary data for the first six months of FY79 suggest a continuation of the change that began to affect accessions late in the summer of 1977: FY79 accessions to date are somewhat below the Case B projections. Thus during the early 1980s DoD may be able to attract only 70 percent of the high school diploma graduate recruits in mental categories I and II that would have been recruited had the FY78 change (whatever its cause) not taken place.

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[1] These projections result from using the estimated supply functions with the FY78 indicator variable, and setting that variable to its pre-FY78 value of zero.

When all three sources of decline--the falling unemployment rate, the smaller population pool, and the effect of the 1978 change--are considered, accessions in categories I and II are projected to be only 56 percent as great in 1984 as they were in the services' best recruiting year since the end of the draft, FY76.

Fortunately, the outlook is not nearly so bleak when the examination shifts to the totals for mental categories I through IIIB. Category IIIA and IIIB accessions apparently were unaffected by whatever caused the FY78 decline in category I and II enlistments. Thus 1984 enlistment levels in categories I through III should be only 28 percent below what they were in the high water year of FY76. The "only" is relative, of course, to the declines discussed above; a fall of one quarter in the number of high quality recruits attracted is still very sizable.

IV. PROJECTION UNCERTAINTY

As the discussion above and the magnitudes of the standard errors reported in Appendix A indicate, this study has not been able to eliminate all or perhaps even most of the uncertainty about the true levels of military enlistments in the 1980s. This section first explores the sources of this uncertainty. It argues that only some of these sources can be quantified meaningfully. Next it describes the procedures followed in producing the reported standard errors and interprets these errors. Finally, it discusses the scope for the improvement of the precision of forecasts of accession levels.

Several sources of the uncertainty about the true levels of accessions can be distinguished, including:

1. Imprecisely estimated structural parameters of Eq. (1) or, indistinguishable from this given a limited sample period, imperfect proxies for the relevant determining forces. The nonzero standard errors for the parameter estimates reflects this imprecision.
2. Less than perfect fits of the estimated supply functions (multiple correlation coefficients less than unity).
3. Uncertainty about the future courses of the independent variables (pay, recruiters, and youth unemployment). For the youth unemployment variable, this can be disaggregated into:

a. Points 1 and 2 above, applied to the regression used to predict youth unemployment based on levels of aggregate unemployment.

b. The likely instability, already discussed, of the parameters of that predicting equation.

4. Possible changes in the structural relationships of the supply functions (e.g., an increase in the effectiveness of recruiters as a given enlistment rate can be maintained with fewer recruits processed).

5. The probable influences of currently unobserved variables (e.g., college admission or financial aid policies).

Taking these sources in reverse order, no attempt has been made to account for uncertainties of types 4 and 5, except as reflected in the two sets of projections for categories I and II.[1] Specific paths have been postulated for the relative pay and recruiter variables, and for the aggregate unemployment rate, but the knowledge of the magnitude of the uncertainty associated with point 3a provided by the unemployment regression has not been incorporated into the estimated standard errors of the projections. Although statistical techniques are available for this task,[2] point 3b would so dominate the uncertainty about youth unemployment as to make the adjustment for 3a meaningless.

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[1] It is important to distinguish between the expected direction and magnitude of the effect of some excluded variable (such as the value of educational benefits) and the degree of uncertainty about that effect. Reasonable guesses might be made about the former, but the discussion here is concerned only with quantifying the latter.

[2] See, e.g., Feldstein (1971).

Thus the standard errors presented in Appendix A reflect uncertainty only of the types 1 and 2.[1] Within the constraints imposed by this limitation, they are appropriate for answering questions of the form: Within what ranges will the level of enlistments (of a particular mental category and for a particular service) fall--with some given degree of certainty--in a particular year? If instead the policy interest is in the average level of accessions over a number of years, the reduction in the errors from ignoring the random fluctuations would be from 10 to 30 percent, varying across services and mental categories.

It might be thought that the standard errors--and thus the confidence bands--could be reduced in size if the number of explanatory variables in the estimated supply equations were reduced. Obvious candidates for elimination in Eq. (1) are some of the largely redundant unemployment terms. To test whether this elimination would reduce the standard errors of the forecasts, the regression for Army accessions in mental categories I and II (Case B) was rerun omitting all the lagged values of the unemployment rate except the zero, six, and eleven month lags. This reduction by nine in the number of parameters estimated reduced the projection standard errors by an average of only 2 percent over the 12 years of projections (only the moderate growth scenario was run). This small gain comes at the expense of a small but statistically significant decrease in the explanatory power of the estimated

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[1] In measuring the latter type, it is assumed that is due solely to purely random disturbances. The substantial positive serial correlation of the residuals in the initial OLS regressions suggests that important variables may have been omitted. To the extent that the effects of these variables do not average to zero over the course of a year, the standard errors developed here will be biased toward zero.

equation.[1] More importantly, restricting the lag structure of the unemployment variable in this way seems to bias the estimate of the total effect toward zero. In this case the reduction is by 25 percent, which is enough to alter the projections appreciably.

A much greater reduction in the uncertainty associated with the projections--one that would not, however, be reflected in the standard errors--would result from an improved understanding of the forces determining the level of youth unemployment. We have assumed that the employment prospects facing youths will continue to be related to those of adults in the future as they have been in the past. The agnosticism of this assumption is forced by the necessity of keeping the scope of this study within manageable bounds. Although it is impossible to quantify the extent of our doubts about the truth of this assumption, it is clear that these doubts are significant. Section V discusses in more detail the implications of possible changes in the relationship between aggregate and youth unemployment rates for the enlistment projections.

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[1] A test of the hypothesis that the coefficients of all nine omitted variables are in fact zero yields an F-value of 2.00, allowing rejection of the hypothesis at the 90 percent confidence level.

V. CONCLUSIONS

Policy analysts considering using the enlistment projections developed here probably will ask three questions. First, which set of projections for mental categories I and II should be used? The answer to this seems to be those denoted Case B. Second, can the projections be trusted? Here we can say yes, with qualifications. Finally, what can be done to improve the enlistment picture? To this last question the current study cannot, unfortunately, provide any answers.

As noted above, preliminary data for the first six months of FY79 show enlistments falling somewhat below the levels projected under Case B.[1] Whatever caused the FY78 decline in enlistments in mental categories I and II is apparently still operating, supporting the hypothesis that it will not be reversed. Thus it does not seem reasonable to treat FY78 as just like any other year, which the Case A projections do, or as representing a one-time drop in accessions. We must consider the less optimistic Case B to be much more likely to indicate the true course of accessions in the 1980s.

As for how accurate the projections will be, our current understanding of the operation of the market for young workers, and of the process through which young men decide among work and nonwork alternatives, is too meager to allow a definitive answer. If the assumptions spelled out in Section III are met, the projections

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[1] These data are not strictly comparable to those used in this study, so the precise comparisons are not reported.

developed here should prove fairly accurate, probably more so than the substantial standard errors would indicate. Simple modifications to the basic time series methodology--using measures of civilian and military pay, recruiting effort, and civilian job opportunities--probably will not yield projections that differ at all markedly.[1] Thus within the framework of the current analysis, the projections should be accurate.

This framework is most likely to prove inadequate in the treatment of the youth labor market. Some analysts foresee a radical improvement in civilian job opportunities for youths in the 1980s. If they are correct--if, for example, a 5.5 percent rate of aggregate unemployment is associated in 1984 with a 12.5 percent rate of youth unemployment, rather than the 15.1 percent rate with which it was associated in the 1970s--then these projections may prove far too optimistic. Assuming that the relationship between youth unemployment and accessions does not change, a 12.5 percent unemployment rate in 1984 would mean DoD-wide accessions of HSDGs in mental categories I through III more than 10 percent below those forecast under the moderate growth scenario to which the 5.5 percent aggregate unemployment rate belongs. It is not inconceivable that the youth unemployment could fall as low as 11 or even 10 percent with the aggregate rate at 5.5 percent--or, for that matter, that it could rise above the 15.1 percent hypothesized--so the accuracy of the enlistment projections is certainly open to question. Although a 10 percent divergence of accessions from their projected

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[1] For a comparison with an earlier study that differed both in the functional form of the enlistment rate equation and in the specific variables used, see Appendix C. Apart from the differences attributable to the addition of the anomalous FY78 data, the results are remarkably similar.

levels would not be inconsistent with the projections due to the rather large confidence bands surrounding them, this fact would hardly be reassuring to a policy planner.

Research is needed to clarify the relationship between youth and aggregate unemployment. In addition, the appropriateness of the measured rate of youth unemployment as an indicator of the tightness of the market for young workers must be examined. In both of these efforts the influence of the military services--sizable employers of young men--cannot be ignored, as has largely been the case in the past.[1]

To answer the final question--what can be done to improve the enlistment picture--it is necessary to have reliable estimates of the effects on enlistments of policy variables. It was not the goal of this study to provide such estimates. Because the two policy variables considered here, relative pay and production recruiters, moved together during the 1970s, it is not possible using time series data limited to that period to distinguish their separate effects. Thus it would be a mistake to conclude, as one might be tempted to do based on Table 5, that Army enlistments of category IIIA HSDGs would be increased 5 percent if the number of Army recruiters were increased by 13 percent, or the level of military pay relative to that in the civilian sector raised by 9 percent. Although it probably is true that increasing both pay and recruiters would increase the supply of high quality recruits,[2] neither this nor any similar time series study is able to

[1] For a discussion of this point, see Cooper (1978).

[2] Even this might not be the case. The spurt in enlistments in the early 1970s may simply have been due to the ending of U.S. involvement in the conflict in Vietnam, and not to the policy initiatives designed to implement the AVF.

say exactly how much each must be increased to achieve a given desired increase in enlistments. Studies that ignore the effect of recruiting effort (e.g., Grissmer, 1978) may have found lower sampling variances of their estimated pay effects; but this is almost certainly a false precision, and the resultant pay elasticities are probably biased upward.

A more promising approach to separating the effect of pay from that of recruiters, and each from the influences of such other factors as advertising and the availability of attractive training, is the comparison of enlistment rates across regions of the county.[1] A study using this approach would be most useful if it concentrated on the very recent past, because the environment that created the FY78 levels of enlistments seems likely to remain. It probably should disaggregate to a finer level than states, because some of the lowest wage states--those in the southeast--seem also to have citizens with greater than usual tastes for military service. The study also would have to address the problems raised by the services' policies with regard to the regional distribution of recruiting resources. If recruiters are assigned to regions based in part on the past enlistment performances of those regions, as it seems they are, ignoring this would result in an overstatement of the effects of recruiters. Previous studies have been deficient in all three respects.[2]

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[1] Two such studies were performed by the General Research Corporation and are reported in Grissmer et al. (1974) and Amey et al. (1976).

[2] Research underway at The Rand Corporation to evaluate the current two-year enlistment test in the Army, Navy, and Marine Corps may provide some understanding of the effects of these variables on enlistment supply.

Some refining of the time series enlistment model is possible: First, additional hypotheses could usefully be tested. Second, additional explanatory variables could be added. Third, variables already present could be improved and refined. Finally, improved estimation procedures could be used.

A test of the relative pay versus absolute pay models should be straightforward and might indicate the advisability of entering the two pay variables separately. Other researchers apparently have not performed this test. The assumption of identical response to all of the explanatory variables during the draft years as during the AVF years could also be tested. Rejection of this hypothesis would suggest that future projections should be based only on data from the AVF period.

Candidates for inclusion as additional explanatory variables include measures of the minimum wage, of the advertising expenditures of the services, and of the availability of "attractive" training opportunities in each of the services. The minimum wage variable should reflect changes in the job coverage of the minimum wage and could supplement the civilian wage variable used here in measuring the monetary benefits to youths of civilian employment. In measuring the effect of advertising, the possibility of a lagged effect should be explored. Finally, although the measure of attractive training slots might not shed any useful light on the reasons for the FY78 decline in enlistments (see Section II), it could help explain the distribution of total DOD accessions among the services.

There is room for improvement in each of the variables in this study. An obvious first candidate is the recruiter variable, because the reduction in its variance occasioned by our having to assume that it

remained constant for each of the services during the last two years of the study may have seriously reduced its ability to explain enlistments. The question of the appropriateness of the civilian wage variable as a proxy for the earnings possibilities of youths deserves attention. The relationship between this variable--average weekly earnings in the total private economy--and the actual earnings of youths could be explored using individual data. Also deserving attention is the unemployment variable, which might be improved along two lines: (1) adding to the number of unemployed some measure of the number of "discouraged workers," those youths who withdraw from the labor force because they believe they cannot find jobs; and (2) replacing the unemployment variable with measures of the availability of jobs that are more directly job related, such as data on accessions and separations in the civilian sector.

At least two improvements in estimation technique are possible. One is to explore the usefulness and advisability of treating the number of monthly enlistments as a Poisson distributed random variable, rather than making the normality assumptions implicit here. This technique has been used previously in cross-sectional analysis (Haggstrom, 1975), and would suggest modifications in both the form of the estimated equation and the manner in which it is fitted. A second improvement would be to recognize the interdependence of the four services, which may arise from two sources. First, the services may be viewed as close substitutes by potential recruits, suggesting that interservice relative measures--of recruiting effort, bonuses, etc.--should be added to each individual service equation. Second, and more directly related to estimation technique, there may be strong correlations among the services in the

variation in enlistments left unexplained by the individual service equations. If this is the case, the efficiency of the estimates, and thus the precision of the projections, could be improved through the use of the seemingly unrelated regression technique (Zellner, 1962; see also Johnston, 1972, pp. 238-241).

These modifications to and possible improvements in the methodology of this study will not necessarily lead to substantial improvements in the acccuracy of the projections produced, or even to an appreciable change in the levels of accessions projected. Rather, their value lies in improving our understanding of the processes involved--an understanding that is as yet severely limited.

Appendix A

ENLISTED SUPPLY PROJECTIONS

Table A.1

ARMY SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	26297 (2540)*	17471 (1075)	23799 (2353)	67567
1980	27560 (2301)	17912 (997)	25120 (2136)	70592
1981	26800 (2240)	17181 (976)	25853 (2081)	69834
1982	25713 (2210)	16641 (965)	25170 (2055)	67834
1983	24648 (2217)	16257 (959)	23838 (2059)	64743
1984	23208 (2311)	15659 (978)	22288 (2142)	61155
1985	22445 (2390)	15333 (989)	20888 (2210)	58666
1986	21901 (2338)	15020 (966)	20230 (2161)	57151
1987	21651 (2308)	14849 (954)	20008 (2134)	56508
1988	21749 (2316)	14917 (957)	20097 (2141)	56763
1989	21776 (2323)	14935 (959)	20120 (2148)	56831
1990	21293 (2276)	14603 (941)	19667 (2104)	55563

* Standard errors in parentheses. See text for explanation.

Table A.2

ARMY SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	26297 (2540)	17471 (1075)	23799 (2353)	67567
1980	27560 (2301)	17912 (997)	25120 (2136)	70592
1981	27134 (2258)	17304 (981)	25906 (2098)	70344
1982	26832 (2251)	16974 (977)	25704 (2091)	69510
1983	26116 (2220)	16479 (960)	25211 (2062)	67806
1984	25156 (2140)	15807 (926)	24298 (1987)	65261
1985	24288 (2065)	15313 (893)	23462 (1918)	63063
1986	23640 (2007)	14906 (868)	22837 (1864)	61383
1987	23369 (1982)	14736 (857)	22578 (1841)	60683
1988	23474 (1989)	14804 (860)	22682 (1847)	60960
1989	23504 (1995)	14822 (863)	22709 (1853)	61035
1990	22985 (1954)	14492 (845)	22203 (1815)	59680

Table A.3

ARMY SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	26297 (2540)	17471 (1075)	23799 (1353)	67567
1980	27550 (2300)	17910 (996)	25119 (2136)	70579
1981	26236 (2239)	16973 (978)	25729 (2082)	68938
1982	24000 (2520)	16156 (1074)	24387 (2341)	64543
1983	21908 (3405)	15749 (1352)	21547 (3143)	59204
1984	21162 (3972)	15860 (1517)	18973 (3652)	55995
1985	20592 (3964)	15547 (1510)	17935 (3643)	54074
1986	20038 (3856)	15142 (1470)	17438 (3544)	52618
1987	19811 (3807)	14969 (1452)	17246 (3499)	52026
1988	19903 (3821)	15038 (1457)	17329 (3511)	52270
1989	19926 (3832)	15056 (1461)	17347 (3522)	52629
1990	19481 (3754)	14721 (1431)	16952 (3450)	51154

Table A.4

NAVY SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	26992 (1618)	14114 (892)	12881 (1032)	53987
1980	28124 (1488)	14998 (802)	13301 (928)	56423
1981	28075 (1454)	14983 (769)	13845 (890)	56903
1982	27029 (1438)	14294 (762)	13539 (883)	54862
1983	25685 (1433)	13531 (767)	12813 (888)	52029
1984	24064 (1473)	12631 (794)	11991 (919)	48686
1985	22904 (1499)	11996 (820)	11181 (948)	46081
1986	22300 (1465)	11723 (803)	10817 (928)	44840
1987	22042 (1447)	11590 (792)	10698 (916)	44330
1988	22137 (1452)	11643 (795)	10749 (919)	44529
1989	22166 (1456)	11656 (798)	10759 (922)	44581
1990	21680 (1427)	11396 (781)	10515 (903)	43951

Table A.5

NAVY SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	26992 (1618)	14114 (892)	12881 (1032)	53987
1980	28124 (1488)	14998 (802)	13301 (928)	56423
1981	28323 (1463)	15123 (774)	13839 (896)	57285
1982	27995 (1458)	14892 (771)	13714 (892)	56601
1983	27398 (1435)	14580 (757)	13491 (876)	55469
1984	26378 (1383)	14028 (730)	12992 (844)	53398
1985	25466 (1335)	13544 (704)	12545 (815)	51555
1986	24785 (1297)	13184 (685)	12213 (792)	50182
1987	24496 (1281)	13033 (676)	12076 (782)	49605
1988	24601 (1285)	13091 (678)	12133 (785)	49825
1989	24635 (1289)	13107 (680)	12146 (787)	49888
1990	24098 (1263)	12817 (667)	11872 (771)	48787

Table A.6

NAVY SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	26992 (1618)	14114 (892)	12881 (1032)	53987
1980	28112 (1487)	14995 (802)	13299 (928)	56406
1981	27676 (1457)	14748 (770)	13848 (892)	56272
1982	25478 (1617)	13364 (859)	13234 (993)	52706
1983	22689 (2088)	11665 (1129)	11741 (1304)	46095
1984	20968 (2374)	10736 (1312)	10197 (1514)	41901
1985	20165 (2364)	10423 (1311)	9576 (1513)	40164
1986	19638 (2300)	10159 (1276)	9323 (1472)	39120
1987	19413 (2271)	10046 (1260)	9222 (1454)	38681
1988	19499 (2279)	10092 (1264)	9268 (1459)	38859
1989	19522 (2286)	10102 (1268)	9275 (1463)	38910
1990	19092 (2240)	9875 (1242)	9061 (1433)	38028

Table A.7

MARINES SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	8789 (591)	6503 (524)	7825 (987)	23117
1980	9677 (554)	6920 (482)	7935 (891)	24532
1981	9488 (548)	6795 (474)	8129 (867)	25512
1982	8827 (543)	6451 (470)	7987 (854)	23265
1983	8198 (538)	6107 (469)	7640 (860)	21945
1984	7425 (544)	5673 (482)	7225 (897)	20323
1985	7067 (544)	5435 (490)	6817 (935)	19319
1986	6909 (532)	5310 (479)	6607 (916)	18826
1987	6834 (525)	5252 (473)	6533 (904)	18619
1988	6868 (527)	5278 (474)	6565 (908)	18711
1989	6873 (528)	5283 (476)	6571 (910)	18727
1990	6715 (518)	5161 (466)	6422 (892)	18298

Table A.8

MARINES SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	8789 (591)	6503 (524)	7825 (987)	23117
1980	9677 (554)	6920 (482)	7935 (891)	24532
1981	9702 (548)	6893 (476)	8121 (873)	24716
1982	9628 (544)	6814 (473)	8035 (869)	24477
1983	9400 (535)	6647 (466)	7880 (857)	23927
1984	9050 (515)	6399 (449)	7590 (826)	23039
1985	8739 (497)	6180 (433)	7329 (797)	22248
1986	8508 (483)	6016 (421)	7134 (775)	21658
1987	8413 (477)	5949 (416)	7055 (765)	21417
1988	8453 (479)	5978 (417)	7088 (768)	21519
1989	8461 (480)	5984 (418)	7096 (770)	21541
1990	8270 (471)	5848 (410)	6936 (754)	21054

Table A.9

MARINES SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	8789 (591)	6503 (524)	7825 (987)	23117
1980	9673 (554)	6919 (482)	7936 (891)	24528
1981	9128 (552)	6631 (477)	8142 (866)	23901
1982	7602 (601)	5897 (532)	7900 (967)	21399
1983	5991 (730)	5108 (684)	7256 (1319)	18355
1984	5468 (802)	4802 (774)	6548 (1561)	16818
1985	5335 (798)	4676 (770)	6208 (1560)	16219
1986	5196 (776)	4554 (750)	6041 (1518)	15791
1987	5143 (767)	4505 (740)	5975 (1499)	15623
1988	5170 (760)	4528 (743)	6005 (1504)	15703
1989	5172 (771)	4532 (745)	6010 (1508)	15714
1990	5049 (756)	4426 (730)	5873 (1478)	15348

Table A.10

AIR FORCE SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	25611 (1857)	15617 (1440)	10482 (1580)	51710
1980	26203 (1709)	15783 (1258)	9954 (1378)	51940
1981	26897 (1670)	15877 (1133)	9884 (1241)	52658
1982	26284 (1651)	15599 (1151)	10008 (1260)	51891
1983	25095 (1646)	15127 (1206)	10041 (1322)	50263
1984	23604 (1690)	14486 (1271)	9949 (1394)	48039
1985	22234 (1720)	13852 (1327)	9690 (1456)	45776
1986	21531 (1681)	13471 (1304)	9422 (1431)	44424
1987	21274 (1660)	13313 (1287)	9312 (1413)	43899
1988	21362 (1665)	13370 (1292)	9353 (1418)	44085
1989	21396 (1670)	13389 (1296)	9367 (1422)	44152
1990	20937 (1636)	13099 (1269)	9163 (1393)	43199

Table A.11

AIR FORCE SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	25611 (1857)	15617 (1440)	10482 (1580)	51710
1980	26203 (1709)	15783 (1258)	9954 (1378)	5194
1981	26892 (1681)	15840 (1133)	9739 (1241)	52471
1982	26630 (1674)	15593 (1110)	9527 (1216)	51750
1983	26140 (1648)	15254 (1074)	9282 (1176)	50676
1984	25189 (1588)	14689 (1034)	8937 (1132)	48815
1985	24314 (1533)	14181 (998)	8628 (1093)	47123
1986	23660 (1490)	13800 (970)	8397 (1062)	45857
1987	23377 (1471)	13637 (958)	8300 (1049)	45314
1988	23473 (1476)	13696 (961)	8337 (1052)	45506
1989	23510 (1480)	13716 (964)	8349 (1055)	45575
1990	23008 (1451)	13419 (944)	8165 (1034)	44592

Table A.12

AIR FORCE SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	25611 (1857)	15617 (1440)	10482 (1580)	51710
1980	26211 (1708)	15789 (1257)	9964 (1378)	51964
1981	26861 (1673)	15920 (1146)	10108 (1254)	52889
1982	25774 (1856)	15634 (1309)	10787 (1434)	52195
1983	23334 (2392)	14911 (1718)	11380 (1888)	49625
1984	20899 (2716)	14021 (1994)	11193 (2194)	46113
1985	19790 (2705)	13477 (1997)	10809 (2197)	44076
1986	19251 (2633)	13119 (1944)	10520 (2138)	42890
1987	19022 (2599)	12965 (1919)	10397 (2111)	42384
1988	19102 (2608)	13020 (1926)	10442 (2118)	42564
1989	19131 (2616)	13039 (1931)	10458 (2125)	42628
1990	18719 (2563)	12756 (1892)	10231 (2082)	41706

Table A.13

DoD SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	87689	53705	54987	196381
1980	91564	55613	56310	213487
1981	91260	54836	57711	203807
1982	87853	52975	56704	197532
1983	83626	51022	54332	188980
1984	78301	48449	51453	178203
1985	74650	46615	48576	169842
1986	72641	45524	47076	165241
1987	71801	45004	46551	163356
1988	72116	45208	46764	164088
1989	72211	45263	46817	164291
1990	70625	44259	45767	160651

Table A.14

DoD SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	87689	53705	54987	196381
1980	91564	55613	56310	203487
1981	92051	55160	57605	204816
1982	91085	54273	56980	202338
1983	89054	52960	55864	197878
1984	85773	50923	53817	190513
1985	82807	49218	51964	183989
1986	80593	47906	50581	179080
1987	79655	47355	50009	177019
1988	80001	47569	50240	177810
1989	80110	47629	50300	178039
1990	78361	46576	49176	174113

Table A.15

DoD SUPPLY PROJECTIONS--CASE A,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	87689	53705	54987	196381
1980	91546	55613	56318	203477
1981	89901	54272	57827	202000
1982	82854	51051	56308	190213
1983	73922	47433	51924	173279
1984	68497	45419	46911	160827
1985	65882	44123	44528	154533
1986	64123	42974	43322	150419
1987	63389	42485	42840	148714
1988	63674	42678	43044	149396
1989	63751	42729	43090	149570
1990	62341	41778	42117	146236

Table A.16

ARMY SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	16383 (2625)	17471 (1075)	23799 (2353)	57653
1980	17242 (2602)	17912 (997)	25120 (2136)	60274
1981	16677 (2500)	17181 (976)	25853 (2081)	59711
1982	16016 (2422)	16641 (965)	25170 (2055)	57827
1983	15414 (2367)	16257 (959)	23838 (2059)	55509
1984	14577 (2307)	15659 (978)	22288 (2142)	52524
1985	14158 (2282)	15333 (989)	20888 (2210)	50379
1986	13833 (2232)	15020 (966)	20230 (2161)	49083
1987	13681 (2205)	14849 (954)	20008 (2134)	48538
1988	13747 (2212)	14917 (957)	20097 (2141)	48761
1989	13760 (2219)	14935 (959)	20120 (2148)	48815
1990	13446 (2174)	14603 (941)	19667 (2104)	47716

Table A.17

ARMY SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	16383 (2625)	17471 (1075)	23799 (2353)	57653
1980	17242 (2602)	17912 (997)	25120 (2136)	60274
1981	16875 (2527)	17304 (981)	25906 (2098)	60085
1982	16663 (2494)	16974 (977)	25704 (2091)	59341
1983	16190 (2433)	16479 (960)	25211 (2062)	57880
1984	15593 (2342)	15807 (926)	24298 (1987)	55698
1985	15058 (2260)	15313 (893)	23462 (1918)	53833
1986	14660 (2197)	14906 (868)	22837 (1864)	52403
1987	14498 (2169)	14736 (857)	22578 (1841)	51812
1988	14567 (2177)	14804 (860)	22682 (1847)	52053
1989	14582 (2183)	14822 (863)	22709 (1853)	52113
1990	14250 (2139)	14492 (845)	22203 (1815)	50945

Table A.18

ARMY SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	16383 (2625)	17471 (1075)	23799 (1353)	57653
1980	17237 (2601)	17910 (996)	25119 (2136)	60266
1981	16338 (2467)	16973 (978)	25729 (2082)	59040
1982	15037 (2415)	16156 (1074)	24387 (2341)	55580
1983	13931 (2590)	15749 (1352)	21547 (3143)	51227
1984	13612 (2758)	15860 (1517)	18973 (3652)	48445
1985	13303 (2734)	15547 (1510)	17935 (3643)	46785
1986	12947 (2661)	15142 (1470)	17438 (3544)	45527
1987	12806 (2628)	14969 (1452)	17246 (3499)	45021
1988	12869 (2637)	15038 (1457)	17329 (3511)	45236
1989	12880 (2645)	15056 (1461)	17347 (3522)	45283
1990	12584 (2591)	14721 (1431)	16952 (3450)	44257

Table A.19

NAVY SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	21154 (2050)	14114 (892)	12881 (1032)	48149
1980	22085 (2032)	14998 (802)	13301 (928)	50384
1981	22250 (1953)	14983 (769)	13845 (890)	51078
1982	21452 (1892)	14294 (762)	13539 (883)	49285
1983	20302 (1850)	13531 (767)	12813 (888)	46646
1984	18953 (1802)	12631 (794)	11991 (919)	43575
1985	17932 (1781)	11996 (820)	11181 (948)	41109
1986	17431 (1742)	11723 (803)	10817 (928)	39971
1987	17233 (1720)	11590 (792)	10698 (916)	39521
1988	17309 (1726)	11643 (795)	10749 (919)	39701
1989	17329 (1731)	11656 (798)	10759 (922)	39744
1990	16945 (1696)	11396 (781)	10515 (903)	38856

Table A.20

NAVY SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	21154 (2050)	14114 (892)	12881 (1032)	48149
1980	22085 (2032)	14998 (802)	13301 (928)	50381
1981	22432 (1973)	15123 (774)	13839 (896)	51394
1982	22206 (1946)	14892 (771)	13714 (892)	50812
1983	21760 (1898)	14580 (757)	13491 (876)	49831
1984	20952 (1827)	14028 (730)	12992 (844)	47972
1985	20229 (1763)	13544 (704)	12545 (815)	46318
1986	19690 (1714)	13184 (685)	12213 (792)	45087
1987	19464 (1692)	13033 (676)	12076 (782)	44573
1988	19549 (1698)	13091 (678)	12133 (785)	44773
1989	19573 (1703)	13107 (680)	12146 (787)	44826
1990	19142 (1669)	12817 (667)	11872 (771)	43831

Table A.21

NAVY SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	21154 (2050)	14114 (892)	12881 (1032)	48149
1980	22074 (2031)	14995 (802)	13299 (928)	50368
1981	21960 (1928)	14748 (770)	13848 (892)	50556
1982	20222 (1886)	13364 (859)	13234 (993)	46820
1983	17799 (2011)	11665 (1129)	11741 (1304)	41205
1984	16136 (2132)	10736 (1312)	10197 (1514)	37069
1985	15415 (2114)	10423 (1311)	9576 (1513)	35414
1986	15012 (2058)	10159 (1276)	9323 (1472)	34494
1987	14843 (2032)	10046 (1260)	9222 (1454)	34111
1988	14911 (2039)	10092 (1264)	9268 (1459)	34271
1989	14926 (2045)	10102 (1268)	9275 (1463)	34303
1990	14592 (2003)	9875 (1242)	9061 (1433)	33528

Table A.22

MARINES SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	7372 (892)	6503 (524)	7825 (987)	21700
1980	8231 (884)	6920 (482)	7935 (891)	23086
1981	8118 (849)	6795 (474)	8129 (867)	23042
1982	7515 (822)	6451 (470)	7987 (854)	21953
1983	6925 (804)	6107 (469)	7640 (860)	20672
1984	6210 (783)	5673 (482)	7225 (897)	19108
1985	5873 (774)	5435 (490)	6817 (935)	18125
1986	5738 (757)	5310 (479)	6607 (916)	17655
1987	5677 (748)	5252 (473)	6533 (904)	17462
1988	5706 (750)	5278 (474)	6565 (908)	17549
1989	5710 (753)	5283 (476)	6571 (910)	17564
1990	5576 (737)	5161 (466)	6422 (892)	17159

Table A.23

MARINES SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	7372 (892)	6503 (524)	7825 (987)	21700
1980	8231 (884)	6920 (482)	7935 (891)	23086
1981	8313 (858)	6893 (476)	8121 (873)	23327
1982	8263 (847)	6814 (473)	8035 (869)	23112
1983	8074 (826)	6647 (466)	7880 (857)	22601
1984	7774 (795)	6399 (449)	7590 (826)	21763
1985	7508 (767)	6180 (433)	7329 (797)	21017
1986	7310 (746)	6016 (421)	7134 (775)	20460
1987	7230 (736)	5949 (416)	7055 (765)	20234
1988	7265 (739)	5978 (417)	7088 (768)	20331
1989	7271 (741)	5984 (418)	7096 (770)	20351
1990	7105 (726)	5848 (410)	6936 (754)	19889

Table A.24

MARINES SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	7372 (892)	6503 (524)	7825 (987)	21700
1980	8228 (884)	6919 (482)	7936 (891)	23083
1981	7788 (837)	6631 (477)	8142 (866)	22561
1982	6372 (820)	5897 (532)	7900 (967)	20169
1983	4823 (876)	5108 (684)	7256 (1319)	17187
1984	4281 (928)	4802 (774)	6548 (1561)	15631
1985	4163 (920)	4676 (770)	6208 (1560)	15047
1986	4054 (896)	4554 (750)	6041 (1518)	14649
1987	4015 (885)	4505 (740)	5975 (1499)	14495
1988	4037 (888)	4528 (743)	6005 (1504)	14570
1989	4038 (890)	4532 (745)	6010 (1508)	14580
1990	3939 (872)	4426 (730)	5873 (1478)	14238

Table A.25

AIR FORCE SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	18980 (2449)	15617 (1440)	10482 (1580)	45079
1980	19401 (2428)	15783 (1258)	9954 (1378)	45138
1981	20471 (2333)	15877 (1133)	9884 (1241)	46232
1982	20142 (2260)	15599 (1151)	10008 (1260)	45749
1983	19122 (2210)	15127 (1206)	10041 (1322)	44290
1984	17891 (2153)	14486 (1271)	9949 (1394)	42326
1985	16610 (2128)	13852 (1327)	9690 (1456)	40152
1986	16008 (2082)	13471 (1304)	9422 (1431)	38901
1987	15819 (2056)	13313 (1287)	9312 (1413)	38444
1988	15886 (2063)	13370 (1292)	9353 (1418)	38609
1989	15909 (2069)	13389 (1296)	9367 (1422)	38665
1990	15566 (2027)	13099 (1269)	9163 (1393)	37828

Table A.26

AIR FORCE SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	18980 (2449)	15617 (1440)	10482 (1580)	45079
1980	19401 (2427)	15783 (1258)	9954 (1378)	45138
1981	20377 (2357)	15840 (1133)	9739 (1241)	45956
1982	20242 (2326)	15593 (1110)	9527 (1216)	45362
1983	19939 (2269)	15254 (1074)	9282 (1176)	44475
1984	19221 (2184)	14689 (1034)	8937 (1132)	42847
1985	18555 (2108)	14181 (998)	8628 (1093)	41364
1986	18056 (2049)	13800 (970)	8397 (1062)	40253
1987	17842 (2023)	13637 (958)	8300 (1049)	39779
1988	17916 (2030)	13696 (961)	8337 (1052)	39949
1989	17943 (2036)	13716 (964)	8349 (1055)	40008
1990	17558 (1995)	13419 (944)	8165 (1034)	39142

Table A.27

AIR FORCE SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	18980 (2449)	15617 (1440)	10482 (1580)	45079
1980	19411 (2427)	15789 (1257)	9964 (1378)	45164
1981	20577 (2303)	15920 (1146)	10108 (1254)	46605
1982	20006 (2254)	15634 (1309)	10787 (1434)	46427
1983	17833 (2408)	14911 (1718)	11380 (1888)	44124
1984	15271 (2556)	14021 (1994)	11193 (2194)	40485
1985	14211 (2534)	13477 (1997)	10809 (2197)	38497
1986	13815 (2467)	13119 (1944)	10520 (2138)	37454
1987	13653 (2435)	12965 (1919)	10397 (2111)	37015
1988	13711 (2444)	13020 (1926)	10442 (2118)	37173
1989	13730 (2451)	13039 (1931)	10458 (2125)	37227
1990	13432 (2401)	12756 (1892)	10231 (2082)	36419

Table A.28

DoD SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
MODERATE GROWTH

Year	I & II	IIIA	IIIB	Total
1979	63889	53705	54987	172581
1980	66959	55613	56310	178882
1981	67516	54836	57711	180063
1982	65125	52975	56704	174814
1983	61763	51022	54332	167117
1984	57631	48449	51453	157533
1985	54573	46615	48576	149765
1986	53010	45524	47076	145610
1987	52410	45004	46551	143965
1988	52648	45208	46764	144620
1989	52708	45263	56817	144788
1990	51533	44259	45767	141559

Table A.29

DoD SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
LOW GROWTH

Year	I & II	IIIA	IIIB	Total
1979	63889	53705	54987	172581
1980	66959	55613	56310	178879
1981	67997	55160	57605	180762
1982	67374	54273	56980	178627
1983	65963	52960	55864	174787
1984	63540	50923	53817	168280
1985	61350	49218	51964	162532
1986	59716	47906	50581	158203
1987	59034	47355	50009	156398
1988	59297	47569	50240	157106
1989	59369	47629	50300	157298
1990	58055	46576	49176	153807

Table A.30

DoD SUPPLY PROJECTIONS--CASE B,
HIGH QUALITY HIGH SCHOOL GRADUATES,
HIGH GROWTH

Year	I & II	IIIA	IIIB	Total
1979	63899	53705	54987	172581
1980	66950	55613	56318	178881
1981	66663	54272	57827	178762
1982	61637	51051	56308	168995
1983	54386	47433	51924	153743
1984	49300	45419	46911	141630
1985	47092	44123	44528	135743
1986	45828	42974	43322	132124
1987	45317	42485	42840	130642
1988	45528	42678	43044	131250
1989	45574	42729	43090	131393
1990	44547	41778	42117	128442

Appendix B

DATA

VOLUNTARY ENLISTMENTS

Two sources were used for these series. For the period July 1970 to December 1972, estimates of the numbers of true volunteers were provided by David Grissmer (The Rand Corporation and formerly with General Research Corporation).[1] These estimates were developed by GRC under the assumption that because no individuals with lottery numbers greater than 200 were drafted during the lottery period, the decisions to enlist of those with lottery numbers exceeding 240 represent the propensity to volunteer of the entire male population.

For the period January 1973 to September 1978, data were provided by the Defense Manpower Data Center (DMDC). No adjustments were made for the very small numbers of draftees who began active duty during the first months of 1973. Both sets of data represent active duty contracts signed; thus, Delayed Entry Program (DEP) enlistees are counted only when they enter active duty.

Because the accessions data came from two different sources, a simple test was made of the importance of differences between the two series. In several preliminary regression runs an indicator variable for the draft period was included. In all cases its estimated coefficient was extremely small and never differed significantly from

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[1] The data are very similar to those presented in Grissmer et al. (1974).

zero. Thus the hypothesis that the two series differ by some constant amount is rejected.

POPULATION POOL

Annual data on the total male population by age, 17 to 21, were adjusted as described below to yield estimates of NPS males. Linear interpolation was then used to produce monthly observations. The original data are those published by the U.S. Bureau of the Census (1977, 1978).

Previous studies have simply used Census estimates of the civilian population. This procedure errs, however, in ignoring the prior military service of some of the civilians of each age. These individuals are no longer part of the population eligible to be NPS enlistees, and so should be excluded from the population pool. Thus an improved procedure would be to use as a base the total population--rather than the civilian population--subtracting from the total for a given cohort in a given year the number of enlistments from that cohort in each preceding year. That is:

$$PA_{i,t} = PT_{i,t} - \sum_{j=1}^{i-17} E_{i-j,t-j} \qquad (B.1)$$

where:

$PA_{i,t}$ = adjusted population of age i at year t;

$PT_{i,t}$ = total population of age i at year t;

$E_{i,t}$ = enlistments in all active services in year t of individuals of age i.

Because data on actual enlistments by age were not available, they were approximated by applying the post-draft average proportions of enlistments of each age to the number of DoD enlistments of all ages (provided by DMDC).

$$PA_{i,t} = PT_{i,t} - \sum_{j=1}^{i-17} W_{i-j} ET_{t-j} \qquad (B.2)$$

where:

W_i = proportion of total enlistees of age i;

ET_t = total enlistments of all ages in year t.

For the projection period even this simplified procedure was not possible because enlistment data were lacking. An approximation to the number of enlistments by age was obtained by assuming that the same proportion of the NPS population at each age would enlist in each year of the projection period as actually enlisted during FY76, a fairly representative year. For example, if 5 percent of the NPS 18 year olds enlisted in FY76, and at the start of FY80 there were an estimated 2 million 18 year olds who did not enter the military as 17 year olds, then 100,000 18 year olds would be assumed to enlist in FY80 (and the FY81 population of 19 year olds reduced by that amount).

The population pool variable is a weighted average of the individual age population numbers thus derived, the weights being the same approximate proportions of total DOD enlistments of each age during

the post-draft years (age 17, .14; 18, .35; 19, .23; 20, .14; 21, .14). The weights were developed by Cooper (1977).

The NPS adjustment can be faulted on at least three grounds: (1) because the dependent variable is the enlistment rate for HSDGs, the adjustment should be based on high school graduate accessions; (2) similar adjustments should be made for the numbers of males deemed unqualified for military service; and (3) for the Case B projections (see Section III) the enlistment rates for FY78 should be used instead of those for FY76. In addition, the FY78 change, relative to previous years, in the proportion of enlistees in mental categories I and II seems to dictate a further adjustment. Although the decision not to make any of these additional adjustments was based solely on the pragmatic grounds of avoiding complexity, as a practical matter the distortions introduced by this decision turn out to be quite small. The change implied by point (3), for example, a decrease in assumed accession levels of more than 20 percent, increases the resultant population pool by only 2 percent. In principle it is possible to use projected accession levels in each year to adjust population pools in subsequent years, but the increase in precision this would introduce is not likely to justify the greatly increased computational complexity.

MILITARY PAY

The measure of military pay adopted is the average total regular military compensation (RMC) during the first year of service for enlistees with less than two years of service for pay purposes. That is, a weighted average of the annual RMC for each enlisted grade is taken, the weights being the proportion of first-year enlistees in each grade. These proportions differed slightly across services, but the

differences were unchanged over the sample period, so only the DoD averages were used to construct the military pay variable. The pay data were provided by David Grissmer.

This simple procedure may be criticized for not acccounting for all of the pay and benefits received by the typical recruit over his entire first term, appropriately discounted. Against this criticism it can be argued that: (1) too little is known about the time preferences of youths to make the selection of a discount rate anything but arbitrary; (2) the individuals considering military service lack sufficient information on advancement rates in either the military or the civilian sector to make the discounting calculation attributed to them; (3) because military pay enters the regressions as a ratio to the civilian pay variable, civilian pay should be similarly discounted using (largely unavailable) age earnings profiles for individuals with the same characteristics as the group of enlistees under consideration; and (4) the decision to enter military service is not a once and for all occupational choice for most individuals, as evidenced by reenlistment rates of substantially less than unity, and so should be considered in a life cycle context with appropriate discounting of post-service earnings.

Discounting of all of first-term pay is the most obvious change that could be made from the simple procedure followed here, but it is less obvious that it would provide the best, or even an improved, measure of the military pay variable actually considered by the potential enlistee. Without any direct evidence that the individuals who do enlist advance in salary (relative to their first-year pay)

at a different rate than they would have in the civilian economy, the justification for any particular discounting scheme is tenuous at best.

CIVILIAN PAY

The measure of pay in the civilian economy is the average weekly earnings in the total private economy, seasonally adjusted, taken from the Bureau of Labor Statistics, Employment and Earnings, various issues. Direct measures of youth earnings are not, unfortunately, available on a monthly basis. The average earnings in the retail trade sector was considered as an alternative, but it was found to be very highly correlated to the total private economy series finally used.

RECRUITERS

Recruiting effort is measured by the number of production recruiters (those with monthly recruiting quotas assigned) employed by the particular service. For the period July 1970 to December 1973, the data were taken from Grissmer et al. (1974). Data through June 1976 were collected from various sources by Richard V. L. Cooper, who supplied them to the author. Because more recent data were not available and informal evidence indicated that the numbers of recruiters remained approximately unchanged from FY76 through FY78, it was assumed that their numbers in June 1976 held through September 1978.

UNEMPLOYMENT

The tightness of the civilian youth labor market is measured by the seasonally adjusted unemployment rate for males aged 16 to 19, as reported by the BLS in Employment and Earnings, various issues. Although it might be argued that the rate for males 18 to 19, or 20 to

24, or both, would be preferable, these two series are so highly correlated with the 16 to 19 rate that it makes little practical difference which is chosen. Because 17 year olds make up a sizable proportion of enlistees, and preliminary experimentation in which both the 16-19 and 20-24 rates were included as independent variables in estimated enlistment supply equations showed that the 20-24 rate added no significant explanatory power, only the 16-19 rate was used in the final regressions.

Table B.1

SUMMARY MEASURES

	Mean	Standard Deviation	Minimum	Maximum
ACCESSIONS:				
Army				
I & II	2131.32	871.40	683	5482
IIIA	1346.93	620.87	504	3784
IIIB	1944.64	1066.43	647	5077
Navy				
I & II	2184.46	743.50	748	4528
IIIA	1178.95	475.47	378	2527
IIIB	1067.71	542.44	173	2494
Marine Corps				
I & II	727.58	360.89	244	2013
IIIA	511.43	279.87	165	1588
IIIB	600.19	335.25	197	1663
Air Force				
I & II	2052.35	562.29	1027	3646
IIIA	1244.48	373.76	570	2023
IIIB	1017.74	405.93	354	2321
POPULATION POOL	1885.94	122.66	1629.22	2034.76
PAY:				
Civilian	157.87	24.88	120.34	206.57
Military	6013.75	1318.40	3406.82	7711.00
Relative	37.75	4.23	27.89	41.45
RECRUITERS:				
Army	4182.28	822.73	2025	5199
Navy	2991.13	524.45	1979	3721
Marine Corps	1691.16	196.91	1262	2015
Air Force	1696.19	187.56	1438	2036
YOUTH UNEMPLOYMENT	16.76	2.13	12.6	21.5

Table B.2

MALE HIGH SCHOOL DIPLOMA GRADUATE NPS ACCESSIONS - ARMY

		I&II	IIIA	IIIB
1970	7	2282	1136	1192
1970	8	2071	1009	1150
1970	9	2019	1015	1068
1970	10	1703	936	934
1970	11	1430	655	711
1970	12	1239	568	647
1971	1	1804	1046	1156
1971	2	1491	877	1006
1971	3	1243	716	889
1971	4	1038	602	655
1971	5	1027	565	690
1971	6	2508	1631	1827
1971	7	1896	1184	1392
1971	8	1917	1204	1316
1971	9	2145	1204	1328
1971	10	1683	1106	1323
1971	11	1613	1052	1400
1971	12	1605	1066	1324
1972	1	2262	1398	1615
1972	2	1794	979	1222
1972	3	1636	908	892
1972	4	1391	764	857
1972	5	1128	627	977
1972	6	3405	2252	2723
1972	7	2686	1657	2056
1972	8	2897	1722	1976
1972	9	2973	1849	1972
1972	10	2284	1416	1564
1972	11	1760	1117	1159
1972	12	1717	985	1131
1973	1	3327	1687	1822
1973	2	2447	1427	1635
1973	3	1958	1057	1234
1973	4	1144	667	755
1973	5	1281	801	945
1973	6	3978	2983	3446
1973	7	2330	1622	2141
1973	8	2525	1638	2056
1973	9	2672	1552	1829
1973	10	1901	1214	1352
1973	11	1649	1020	1189
1973	12	1421	873	961
1974	1	2662	1550	1685
1974	2	2021	1288	1441
1974	3	1925	1150	1327
1974	4	1500	873	1111
1974	5	1526	1002	1222
1974	6	4021	2991	3986
1974	7	2646	1865	2480
1974	8	3141	2067	2542
1974	9	3235	2038	2508
1974	10	2616	1583	2004
1974	11	2228	1381	1715
1974	12	1149	651	787
1975	1	3115	1855	2199
1975	2	2325	1310	1684
1975	3	1720	1025	1159
1975	4	1563	936	1058
1975	5	2691	1720	2154
1975	6	5482	3784	4911
1975	7	3163	2380	2966
1975	8	3545	2458	3133
1975	9	3461	2461	3157
1975	10	2871	1865	2525
1975	11	2067	1429	1952
1975	12	2094	1179	1550
1976	1	2430	1370	2128
1976	2	2359	966	1604
1976	3	1972	657	1334
1976	4	1601	504	1058
1976	5	2091	698	1432
1976	6	4471	2292	4525
1976	7	2969	1506	2930
1976	8	4019	1640	3404
1976	9	3640	1721	3451
1976	10	2217	1173	2342
1976	11	1832	1164	2209
1976	12	1189	622	1205
1977	1	2156	1405	2358
1977	2	1622	1117	1957
1977	3	1516	1094	1962
1977	4	1150	768	1530
1977	5	1068	720	1376
1977	6	3065	2488	5077
1977	7	2445	2082	4391
1977	8	2321	1926	3761
1977	9	2732	2107	3854
1977	10	1353	1069	2207
1977	11	1131	955	2109
1977	12	683	540	1001
1978	1	1406	1181	2118
1978	2	1150	878	1667
1978	3	1040	759	1463
1978	4	693	525	1112
1978	5	794	655	1338
1978	6	2118	2321	4546
1978	7	1809	1847	4122
1978	8	1963	2021	4094
1978	9	1949	1947	4081

Table B.3

MALE HIGH SCHOOL DIPLOMA GRADUATE NPS ACCESSIONS - NAVY

		I&II	IIIA	IIIB
1970	7	1969	1139	730
1970	8	1866	1036	584
1970	9	1456	652	311
1970	10	1515	649	341
1970	11	1301	651	346
1970	12	957	535	335
1971	1	1775	924	459
1971	2	1657	782	420
1971	3	1409	685	401
1971	4	1017	421	259
1971	5	748	378	173
1971	6	1880	1173	695
1971	7	2325	1400	1117
1971	8	3101	1723	1277
1971	9	2233	1396	1118
1971	10	2379	1124	749
1971	11	1813	902	613
1971	12	1119	634	465
1972	1	2162	1162	955
1972	2	1767	839	735
1972	3	1429	750	733
1972	4	1026	499	510
1972	5	1047	618	567
1972	6	2325	1475	1579
1972	7	2619	1448	1461
1972	8	3219	1742	1499
1972	9	3075	1686	1608
1972	10	2001	1027	903
1972	11	1976	1029	773
1972	12	1407	561	534
1973	1	2345	849	599
1973	2	1751	697	518
1973	3	1743	828	600
1973	4	1379	681	493
1973	5	1306	674	606
1973	6	2782	1708	1753
1973	7	2518	1524	1647
1973	8	2841	1626	1643
1973	9	2892	1454	1485
1973	10	2239	1097	898
1973	11	1753	865	779
1973	12	1245	642	605
1974	1	2628	1200	1191
1974	2	1927	835	870
1974	3	1797	850	848
1974	4	1508	741	704
1974	5	1513	775	772
1974	6	3053	1928	1946
1974	7	2866	1597	1568
1974	8	3048	1614	1651
1974	9	3185	1605	1701
1974	10	2610	1266	1195
1974	11	1995	1028	1054
1974	12	1659	897	746
1975	1	2585	1454	846
1975	2	2161	1122	508
1975	3	2063	1126	545
1975	4	2004	1253	741
1975	5	2164	1313	872
1975	6	3667	2527	2149
1975	7	3238	2214	1642
1975	8	3283	2168	1737
1975	9	3445	2309	1673
1975	10	2775	1702	1176
1975	11	2217	1450	1023
1975	12	2143	1168	746
1976	1	2409	1112	903
1976	2	2093	813	756
1976	3	2148	672	676
1976	4	1890	555	602
1976	5	1939	573	687
1976	6	3121	1393	1850
1976	7	3805	1592	1911
1976	8	4528	1609	1860
1976	9	3669	1465	1813
1976	10	3265	1275	1727
1976	11	2913	1207	1242
1976	12	2095	909	1031
1977	1	2798	1339	1420
1977	2	2092	1069	1075
1977	3	1907	1061	1131
1977	4	1561	844	839
1977	5	1591	923	824
1977	6	2717	1917	2494
1977	7	3029	2130	2453
1977	8	3601	2365	2380
1977	9	2780	1766	1741
1977	10	1952	1279	1165
1977	11	1568	1045	983
1977	12	1357	862	869
1978	1	2070	1281	1159
1978	2	1543	929	946
1978	3	1448	895	855
1978	4	1005	699	660
1978	5	1249	737	845
1978	6	2184	1706	1803
1978	7	2421	1734	1986
1978	8	2427	1667	1764
1978	9	2186	1466	1473

Table B.4

MALE HIGH SCHOOL DIPLOMA GRADUATE NPS ACCESSIONS - MARINE CORPS

		I&II	IIIA	IIIB
1970	7	751	511	606
1970	8	980	689	693
1970	9	1002	573	666
1970	10	558	389	409
1970	11	469	331	338
1970	12	382	274	342
1971	1	628	369	485
1971	2	463	291	384
1971	3	396	247	263
1971	4	308	255	290
1971	5	270	204	234
1971	6	651	530	678
1971	7	793	563	635
1971	8	824	531	685
1971	9	814	498	661
1971	10	525	373	459
1971	11	351	254	337
1971	12	368	247	313
1972	1	646	385	479
1972	2	480	359	357
1972	3	442	312	417
1972	4	342	208	299
1972	5	264	244	311
1972	6	935	734	863
1972	7	830	535	625
1972	8	737	531	708
1972	9	802	490	567
1972	10	535	359	483
1972	11	382	275	426
1972	12	289	213	311
1973	1	709	424	566
1973	2	463	302	391
1973	3	333	222	276
1973	4	244	165	210
1973	5	304	225	235
1973	6	984	684	801
1973	7	784	607	628
1973	8	843	626	613
1973	9	831	516	560
1973	10	582	360	362
1973	11	416	286	317
1973	12	380	261	282
1974	1	682	431	449
1974	2	565	321	398
1974	3	460	311	375
1974	4	278	211	197
1974	5	327	252	274
1974	6	1377	1050	1062
1974	7	910	746	815
1974	8	1049	789	832
1974	9	1089	690	729
1974	10	753	541	544
1974	11	480	327	328
1974	12	473	291	304
1975	1	774	486	525
1975	2	770	488	420
1975	3	753	454	373
1975	4	666	381	273
1975	5	956	646	481
1975	6	2013	1588	1349
1975	7	1431	1113	962
1975	8	1472	1000	939
1975	9	1374	947	856
1975	10	883	671	613
1975	11	713	583	537
1975	12	879	567	507
1976	1	863	560	588
1976	2	829	404	466
1976	3	785	325	399
1976	4	565	229	328
1976	5	685	320	370
1976	6	1485	909	1135
1976	7	1586	826	1061
1976	8	1492	727	959
1976	9	1559	674	932
1976	10	998	455	666
1976	11	620	386	578
1976	12	575	414	619
1977	1	785	520	697
1977	2	656	446	572
1977	3	566	399	458
1977	4	387	253	347
1977	5	421	333	386
1977	6	1353	1196	1663
1977	7	1336	1188	1581
1977	8	1258	1116	1441
1977	9	1005	824	943
1977	10	509	443	607
1977	11	346	289	387
1977	12	402	282	387
1978	1	552	456	641
1978	2	419	341	472
1978	3	367	301	413
1978	4	306	239	332
1978	5	419	429	557
1978	6	924	1142	1624
1978	7	909	988	1479
1978	8	918	985	1405
1978	9	933	897	1219

Table B.5

MALE HIGH SCHOOL DIPLOMA GRADUATE NPS ACCESSIONS - AIR FORCE

		I&II	IIIA	IIIB
1970	7	1149	643	572
1970	8	1028	587	601
1970	9	1126	570	591
1970	10	1639	887	818
1970	11	1598	922	877
1970	12	1218	626	630
1971	1	1274	583	654
1971	2	1274	649	658
1971	3	1652	885	992
1971	4	1410	701	902
1971	5	1265	696	875
1971	6	2293	1460	1687
1971	7	2260	1426	1663
1971	8	2413	1551	1716
1971	9	2424	1401	1520
1971	10	1850	1078	1192
1971	11	1416	687	757
1971	12	1408	659	696
1972	1	1640	842	650
1972	2	1348	590	601
1972	3	1554	592	692
1972	4	1728	868	943
1972	5	2001	1189	1249
1972	6	2035	1180	1333
1972	7	2524	1764	2087
1972	8	2841	1592	1669
1972	9	2999	1600	1401
1972	10	2692	1452	1616
1972	11	2475	1289	1349
1972	12	1283	734	819
1973	1	3330	1465	1582
1973	2	2435	1264	1303
1973	3	1861	910	899
1973	4	1558	832	826
1973	5	1827	1114	1195
1973	6	2792	2023	2321
1973	7	2365	1506	1617
1973	8	2677	1609	1700
1973	9	2397	1376	1344
1973	10	2162	1314	1282
1973	11	1839	1141	1192
1973	12	1027	723	873
1974	1	2150	1408	1567
1974	2	1733	1132	1310
1974	3	1678	1186	1250
1974	4	1484	1011	1097
1974	5	1499	990	1147
1974	6	1663	1361	2176
1974	7	2036	1586	1661
1974	8	2117	1597	1687
1974	9	2167	1563	1236
1974	10	1862	1350	1143
1974	11	1729	1306	1045
1974	12	1194	823	738
1975	1	2216	1546	1195
1975	2	1828	1329	1004
1975	3	2012	1280	922
1975	4	2113	1319	927
1975	5	2175	1318	937
1975	6	2265	1738	1352
1975	7	2411	1715	1202
1975	8	2513	1725	1197
1975	9	2516	1721	1019
1975	10	2177	1609	1087
1975	11	2345	1524	956
1975	12	1734	1191	820
1976	1	2292	1460	988
1976	2	2320	1214	826
1976	3	2618	1243	721
1976	4	2514	1020	544
1976	5	2069	722	354
1976	6	2616	1445	924
1976	7	3318	1370	855
1976	8	3646	1396	775
1976	9	3592	1161	658
1976	10	3280	1189	592
1976	11	2337	979	528
1976	12	2320	1011	474
1977	1	2821	1566	820
1977	2	2313	1385	649
1977	3	2479	1533	746
1977	4	2028	1207	568
1977	5	1923	1071	464
1977	6	2594	2013	1063
1977	7	2215	1837	1040
1977	8	2623	1985	1069
1977	9	2395	1682	964
1977	10	1878	1342	761
1977	11	1689	1199	566
1977	12	1615	1251	632
1978	1	1681	1213	584
1978	2	1487	1054	542
1978	3	1827	1197	594
1978	4	1437	954	464
1978	5	1439	998	480
1978	6	2069	1886	1068
1978	7	1966	1889	1046
1978	8	2112	1885	993
1978	9	1966	1539	785

Table B.6

NPS MALE POPULATION (thousands)

		17	18	19	20	21	POOL
1970	7	1958	1835	1577	1342	1159	1629
1970	8	1962	1840	1585	1355	1164	1636
1970	9	1966	1844	1593	1367	1168	1642
1970	10	1970	1848	1601	1379	1172	1648
1970	11	1974	1853	1609	1392	1177	1655
1970	12	1978	1857	1617	1404	1181	1661
1971	1	1981	1862	1624	1417	1186	1667
1971	2	1985	1866	1632	1429	1190	1673
1971	3	1989	1871	1640	1442	1195	1680
1971	4	1993	1875	1648	1454	1199	1686
1971	5	1997	1879	1656	1466	1203	1692
1971	6	2001	1884	1664	1479	1208	1698
1971	7	2005	1889	1672	1491	1217	1706
1971	8	2008	1894	1680	1502	1231	1713
1971	9	2011	1899	1687	1513	1244	1720
1971	10	2015	1904	1695	1524	1258	1728
1971	11	2018	1910	1703	1535	1272	1736
1971	12	2021	1915	1711	1546	1286	1743
1972	1	2025	1920	1718	1557	1299	1750
1972	2	2028	1925	1726	1568	1313	1758
1972	3	2031	1931	1734	1579	1327	1766
1972	4	2035	1936	1742	1590	1341	1773
1972	5	2038	1941	1749	1601	1354	1781
1972	6	2041	1946	1757	1612	1368	1788
1972	7	2044	1951	1763	1622	1380	1795
1972	8	2046	1954	1768	1629	1391	1800
1972	9	2048	1957	1773	1637	1402	1805
1972	10	2050	1960	1777	1644	1412	1810
1972	11	2052	1963	1782	1652	1423	1815
1972	12	2054	1966	1787	1659	1434	1820
1973	1	2055	1969	1791	1667	1444	1824
1973	2	2057	1972	1796	1674	1455	1829
1973	3	2059	1975	1801	1682	1466	1834
1973	4	2061	1978	1805	1689	1476	1839
1973	5	2063	1981	1810	1697	1487	1844
1973	6	2065	1984	1815	1704	1498	1849
1973	7	2069	1987	1819	1711	1507	1854
1973	8	2076	1990	1824	1717	1515	1859
1973	9	2082	1993	1829	1723	1523	1864
1973	10	2088	1996	1834	1728	1531	1869
1973	11	2095	1998	1839	1734	1539	1874
1973	12	2101	2001	1844	1740	1547	1879
1974	1	2108	2004	1848	1746	1556	1884
1974	2	2114	2007	1853	1752	1564	1889
1974	3	2121	2009	1858	1758	1572	1894
1974	4	2127	2012	1863	1763	1580	1898
1974	5	2133	2015	1868	1769	1588	1903
1974	6	2140	2018	1873	1775	1596	1909
1974	7	2143	2022	1876	1780	1603	1913
1974	8	2144	2029	1879	1785	1609	1918

Table B.6 (cont.)

NPS MALE POPULATION (thousands)

		17	18	19	20	21	POOL
1974	9	2144	2035	1881	1790	1614	1922
1974	10	2144	2041	1884	1795	1620	1926
1974	11	2145	2048	1886	1799	1626	1930
1974	12	2145	2054	1889	1804	1631	1935
1975	1	2145	2060	1891	1809	1637	1939
1975	2	2146	2067	1894	1814	1643	1943
1975	3	2146	2073	1896	1818	1648	1947
1975	4	2146	2079	1899	1823	1654	1952
1975	5	2147	2086	1901	1828	1660	1956
1975	6	2147	2092	1904	1833	1665	1960
1975	7	2147	2095	1908	1836	1670	1964
1975	8	2146	2096	1915	1839	1675	1966
1975	9	2146	2096	1922	1842	1680	1969
1975	10	2145	2096	1928	1845	1684	1971
1975	11	2145	2097	1935	1847	1689	1974
1975	12	2144	2097	1942	1850	1694	1977
1976	1	2144	2097	1948	1853	1698	1979
1976	2	2143	2098	1955	1856	1703	1982
1976	3	2143	2098	1962	1858	1708	1985
1976	4	2142	2098	1968	1861	1712	1987
1976	5	2142	2099	1975	1864	1717	1990
1976	6	2141	2099	1982	1867	1722	1993
1976	7	2141	2099	1985	1871	1725	1994
1976	8	2140	2098	1986	1877	1728	1995
1976	9	2140	2098	1986	1883	1731	1997
1976	10	2139	2097	1987	1889	1734	1998
1976	11	2139	2097	1988	1895	1736	1999
1976	12	2138	2096	1988	1901	1739	2000
1977	1	2138	2096	1989	1908	1742	2001
1977	2	2137	2095	1989	1914	1745	2002
1977	3	2137	2095	1990	1920	1747	2004
1977	4	2136	2094	1991	1926	1750	2005
1977	5	2136	2094	1991	1932	1753	2006
1977	6	2135	2093	1992	1938	1756	2007
1977	7	2136	2093	1993	1942	1760	2008
1977	8	2139	2094	1994	1945	1767	2011
1977	9	2142	2094	1996	1948	1774	2013
1977	10	2145	2094	1998	1951	1781	2015
1977	11	2148	2095	1999	1954	1787	2017
1977	12	2151	2095	2001	1957	1794	2020
1978	1	2153	2096	2002	1960	1801	2022
1978	2	2156	2096	2004	1963	1808	2024
1978	3	2159	2097	2005	1966	1814	2027
1978	4	2162	2097	2007	1969	1821	2029
1978	5	2165	2097	2009	1972	1828	2031
1978	6	2168	2098	2010	1975	1835	2034
1978	7	2167	2099	2010	1976	1839	2034
1978	8	2164	2101	2009	1976	1841	2035
1978	9	2160	2103	2007	1976	1843	2035

Table B.7

NPS MALE POPULATION - PROJECTED (thousands)

		17	18	19	20	21	POOL
1978	10	2157	2105	2005	1976	1844	2035
1978	11	2154	2107	2004	1976	1846	2035
1978	12	2150	2109	2002	1976	1848	2035
1979	1	2147	2110	2001	1977	1850	2035
1979	2	2143	2112	1999	1977	1852	2035
1979	3	2140	2114	1998	1977	1854	2035
1979	4	2137	2116	1996	1977	1855	2035
1979	5	2133	2118	1994	1977	1857	2035
1979	6	2130	2120	1993	1977	1859	2036
1979	7	2127	2119	1993	1976	1860	2035
1979	8	2124	2116	1995	1975	1860	2034
1979	9	2121	2113	1997	1973	1860	2032
1979	10	2119	2109	1999	1972	1861	2031
1979	11	2116	2106	2001	1970	1861	2030
1979	12	2113	2103	2003	1969	1861	2029
1980	1	2111	2099	2004	1967	1861	2027
1980	2	2108	2096	2006	1966	1861	2026
1980	3	2105	2093	2008	1964	1861	2025
1980	4	2103	2089	2010	1963	1862	2023
1980	5	2100	2086	2012	1961	1862	2022
1980	6	2097	2083	2014	1960	1862	2021
1980	7	2095	2080	2013	1960	1861	2019
1980	8	2093	2077	2010	1962	1860	2017
1980	9	2090	2075	2007	1964	1858	2016
1980	10	2088	2072	2004	1966	1857	2014
1980	11	2086	2069	2000	1968	1855	2011
1980	12	2083	2067	1997	1970	1854	2010
1981	1	2081	2064	1994	1971	1852	2008
1981	2	2079	2062	1991	1973	1851	2006
1981	3	2076	2059	1987	1975	1849	2004
1981	4	2074	2056	1984	1977	1848	2002
1981	5	2072	2054	1981	1979	1846	2000
1981	6	2069	2051	1978	1981	1845	1998
1981	7	2064	2049	1975	1980	1845	1996
1981	8	2057	2047	1972	1977	1847	1993
1981	9	2049	2044	1970	1974	1848	1990
1981	10	2041	2042	1967	1971	1850	1988
1981	11	2034	2040	1965	1968	1852	1986
1981	12	2026	2038	1962	1965	1854	1983
1982	1	2019	2035	1960	1961	1855	1980
1982	2	2011	2033	1957	1958	1857	1977
1982	3	2004	2031	1955	1955	1859	1975
1982	4	1996	2029	1952	1952	1861	1972
1982	5	1988	2026	1950	1949	1862	1969
1982	6	1981	2024	1947	1946	1864	1967
1982	7	1973	2019	1945	1943	1866	1963
1982	8	1964	2012	1943	1940	1867	1959
1982	9	1955	2004	1941	1938	1869	1955
1982	10	1947	1997	1939	1936	1870	1950
1982	11	1938	1990	1937	1933	1871	1946

Table B.7 (cont.)

NPS MALE POPULATION - PROJECTED (thousands)

		17	18	19	20	21	POOL
1982	12	1929	1982	1935	1931	1873	1941
1983	1	1921	1975	1932	1928	1874	1937
1983	2	1912	1967	1930	1926	1876	1932
1983	3	1903	1960	1928	1923	1877	1928
1983	4	1895	1953	1926	1921	1878	1924
1983	5	1886	1945	1924	1919	1880	1919
1983	6	1877	1938	1922	1916	1881	1915
1983	7	1871	1930	1917	1914	1879	1909
1983	8	1866	1921	1910	1912	1872	1903
1983	9	1862	1913	1903	1910	1865	1896
1983	10	1858	1904	1896	1908	1859	1890
1983	11	1853	1895	1889	1906	1852	1883
1983	12	1849	1887	1882	1904	1845	1877
1984	1	1844	1878	1875	1901	1839	1870
1984	2	1840	1870	1868	1899	1832	1864
1984	3	1835	1861	1861	1897	1825	1857
1984	4	1831	1852	1854	1895	1819	1851
1984	5	1827	1844	1847	1893	1812	1845
1984	6	1822	1835	1840	1891	1805	1838
1984	7	1818	1829	1832	1887	1801	1832
1984	8	1815	1825	1824	1880	1799	1827
1984	9	1812	1820	1816	1873	1797	1822
1984	10	1809	1816	1808	1866	1795	1817
1984	11	1805	1812	1800	1859	1793	1812
1984	12	1802	1808	1792	1852	1791	1807
1985	1	1799	1803	1784	1845	1790	1802
1985	2	1796	1799	1776	1838	1788	1797
1985	3	1792	1795	1768	1831	1786	1792
1985	4	1789	1791	1760	1824	1784	1787
1985	5	1786	1786	1752	1817	1782	1782
1985	6	1783	1782	1744	1810	1780	1777
1985	7	1782	1778	1738	1803	1776	1773
1985	8	1784	1775	1734	1795	1769	1769
1985	9	1786	1772	1730	1787	1763	1765
1985	10	1787	1769	1726	1780	1756	1761
1985	11	1789	1766	1722	1772	1750	1758
1985	12	1791	1763	1718	1764	1743	1754
1986	1	1793	1759	1713	1756	1737	1750
1986	2	1795	1756	1709	1748	1730	1746
1986	3	1797	1753	1705	1740	1724	1742
1986	4	1798	1750	1701	1733	1717	1738
1986	5	1800	1747	1697	1725	1711	1735
1986	6	1802	1744	1693	1717	1704	1731
1986	7	1805	1743	1689	1711	1697	1728
1986	8	1809	1745	1687	1707	1690	1728
1986	9	1812	1747	1684	1703	1682	1726
1986	10	1816	1748	1680	1699	1675	1725
1986	11	1820	1750	1678	1695	1668	1724
1986	12	1824	1752	1675	1691	1660	1723
1987	1	1827	1754	1671	1687	1653	1722

Table B.7 (cont.)

NPS MALE POPULATION - PROJECTED (thousands)

		17	18	19	20	21	POOL
1987	2	1831	1756	1669	1683	1645	1721
1987	3	1835	1758	1666	1679	1638	1720
1987	4	1839	1759	1662	1675	1631	1718
1987	5	1842	1761	1660	1671	1623	1717
1987	6	1846	1763	1657	1667	1616	1716
1987	7	1850	1766	1656	1663	1610	1716
1987	8	1854	1770	1658	1661	1606	1718
1987	9	1858	1773	1659	1658	1603	1719
1987	10	1861	1777	1661	1654	1599	1720
1987	11	1865	1781	1663	1652	1595	1722
1987	12	1869	1784	1664	1649	1591	1722
1988	1	1873	1788	1666	1645	1588	1724
1988	2	1877	1792	1668	1643	1584	1725
1988	3	1881	1795	1669	1640	1580	1726
1988	4	1884	1799	1671	1636	1576	1727
1988	5	1888	1803	1673	1634	1573	1729
1988	6	1892	1806	1674	1631	1569	1730
1988	7	1887	1810	1677	1630	1566	1731
1988	8	1874	1814	1680	1632	1563	1731
1988	9	1861	1817	1684	1633	1560	1731
1988	10	1848	1821	1687	1635	1557	1731
1988	11	1834	1825	1691	1637	1555	1731
1988	12	1821	1828	1694	1638	1552	1731
1989	1	1808	1832	1698	1640	1549	1731
1989	2	1795	1836	1701	1642	1546	1731
1989	3	1781	1839	1705	1643	1544	1731
1989	4	1768	1843	1708	1645	1541	1731
1989	5	1755	1847	1712	1647	1538	1732
1989	6	1742	1850	1715	1648	1535	1731
1989	7	1731	1845	1719	1651	1535	1729
1989	8	1723	1833	1722	1654	1536	1725
1989	9	1715	1820	1726	1657	1538	1721
1989	10	1708	1806	1729	1661	1539	1717
1989	11	1700	1794	1733	1664	1541	1713
1989	12	1692	1781	1736	1667	1542	1709
1990	1	1684	1767	1740	1671	1544	1705
1990	2	1676	1755	1743	1674	1545	1700
1990	3	1668	1742	1747	1677	1547	1696
1990	4	1661	1728	1750	1681	1548	1692
1990	5	1653	1716	1754	1684	1550	1688
1990	6	1645	1703	1757	1687	1551	1684
1990	7	1640	1692	1753	1691	1554	1679
1990	8	1637	1684	1741	1694	1557	1674
1990	9	1634	1676	1728	1698	1560	1669
1990	10	1631	1669	1716	1702	1563	1664
1990	11	1628	1661	1704	1705	1566	1659
1990	12	1625	1653	1692	1709	1569	1654

Table B.8

AVERAGE FIRST YEAR ENLISTED RMC

1970	7	3406.82	1974	9	5996.50
1970	8	3406.82	1974	10	6518.70
1970	9	3406.82	1974	11	6518.70
1970	10	3406.82	1974	12	6518.70
1970	11	3406.82	1975	1	6518.70
1970	12	3406.82	1975	2	6518.70
1971	1	3632.20	1975	3	6518.70
1971	2	3632.20	1975	4	6518.70
1971	3	3632.20	1975	5	6518.70
1971	4	3632.20	1975	6	6518.70
1971	5	3632.20	1975	7	6518.70
1971	6	3632.20	1975	8	6518.70
1971	7	3632.20	1975	9	6518.70
1971	8	3632.20	1975	10	6916.60
1971	9	3632.20	1975	11	6916.60
1971	10	3632.20	1975	12	6916.60
1971	11	4351.00	1976	1	6916.60
1971	12	5173.80	1976	2	6916.60
1972	1	5398.60	1976	3	6916.60
1972	2	5398.60	1976	4	6916.60
1972	3	5398.60	1976	5	6916.60
1972	4	5398.60	1976	6	6916.60
1972	5	5398.60	1976	7	6916.60
1972	6	5398.60	1976	8	6916.60
1972	7	5398.60	1976	9	6916.60
1972	8	5398.60	1976	10	7203.40
1972	9	5398.60	1976	11	7203.40
1972	10	5398.60	1976	12	7203.40
1972	11	5398.60	1977	1	7203.40
1972	12	5398.60	1977	2	7203.40
1973	1	5792.90	1977	3	7203.40
1973	2	5792.90	1977	4	7203.40
1973	3	5792.90	1977	5	7203.40
1973	4	5792.90	1977	6	7203.40
1973	5	5792.90	1977	7	7203.40
1973	6	5792.90	1977	8	7203.40
1973	7	5792.90	1977	9	7203.40
1973	8	5792.90	1977	10	7711.00
1973	9	5792.90	1977	11	7711.00
1973	10	5996.50	1977	12	7711.00
1973	11	5996.50	1978	1	7711.00
1973	12	5996.50	1978	2	7711.00
1974	1	5996.50	1978	3	7711.00
1974	2	5996.50	1978	4	7711.00
1974	3	5996.50	1978	5	7711.00
1974	4	5996.50	1978	6	7711.00
1974	5	5996.50	1978	7	7711.00
1974	6	5996.50	1978	8	7711.00
1974	7	5996.50	1978	9	7711.00
1974	8	5996.50			

Table B.9

AVERAGE WEEKLY EARNINGS, TOTAL PRIVATE ECONOMY
SEASONALLY ADJUSTED

1970	7	120.53	1974	9	158.05
1970	8	120.95	1974	10	158.70
1970	9	120.34	1974	11	157.83
1970	10	120.66	1974	12	158.84
1970	11	121.40	1975	1	159.20
1970	12	122.14	1975	2	159.12
1971	1	123.25	1975	3	159.31
1971	2	123.98	1975	4	160.11
1971	3	125.09	1975	5	161.19
1971	4	125.46	1975	6	162.72
1971	5	126.57	1975	7	163.08
1971	6	126.94	1975	8	165.43
1971	7	126.62	1975	9	165.70
1971	8	128.41	1975	10	166.88
1971	9	127.37	1975	11	168.69
1971	10	129.15	1975	12	169.52
1971	11	129.87	1976	1	171.92
1971	12	130.98	1976	2	172.17
1972	1	133.21	1976	3	171.95
1972	2	133.57	1976	4	172.56
1972	3	134.68	1976	5	174.48
1972	4	135.79	1976	6	174.72
1972	5	135.42	1976	7	175.81
1972	6	135.79	1976	8	176.76
1972	7	136.16	1976	9	177.35
1972	8	137.27	1976	10	178.56
1972	9	138.38	1976	11	180.36
1972	10	139.87	1976	12	181.08
1972	11	139.86	1977	1	181.51
1972	12	140.21	1977	2	184.11
1973	1	140.94	1977	3	185.55
1973	2	142.08	1977	4	187.00
1973	3	143.21	1977	5	187.72
1973	4	144.32	1977	6	188.28
1973	5	144.30	1977	7	189.72
1973	6	145.04	1977	8	189.19
1973	7	146.52	1977	9	190.63
1973	8	146.12	1977	10	193.50
1973	9	147.23	1977	11	194.04
1973	10	147.57	1977	12	194.22
1973	11	149.48	1978	1	193.83
1973	12	149.41	1978	2	195.99
1974	1	149.37	1978	3	199.44
1974	2	150.88	1978	4	202.52
1974	3	151.20	1978	5	201.76
1974	4	150.33	1978	6	203.19
1974	5	153.35	1978	7	204.99
1974	6	155.18	1978	8	205.13
1974	7	155.55	1978	9	206.57
1974	8	156.59			

Table B.10

PRODUCTION RECRUITERS
ARMY

1970	7	2052	1974	9	4668
1970	8	2025	1974	10	4733
1970	9	2071	1974	11	4794
1970	10	2081	1974	12	5096
1970	11	2083	1975	1	5032
1970	12	2162	1975	2	4999
1971	1	2212	1975	3	5019
1971	2	2319	1975	4	5063
1971	3	2356	1975	5	4954
1971	4	2500	1975	6	4887
1971	5	2538	1975	7	4686
1971	6	2764	1975	8	4599
1971	7	2851	1975	9	4618
1971	8	2923	1975	10	4608
1971	9	3187	1975	11	4637
1971	10	3430	1975	12	4759
1971	11	3657	1976	1	4830
1971	12	3783	1976	2	4367
1972	1	4006	1976	3	4399
1972	2	4212	1976	4	4373
1972	3	4404	1976	5	4367
1972	4	4464	1976	6	4349
1972	5	4827	1976	7	4349
1972	6	4749	1976	8	4349
1972	7	4684	1976	9	4349
1972	8	4678	1976	10	4349
1972	9	4605	1976	11	4349
1972	10	4561	1976	12	4349
1972	11	4536	1977	1	4349
1972	12	4570	1977	2	4349
1973	1	4446	1977	3	4349
1973	2	4671	1977	4	4349
1973	3	4326	1977	5	4349
1973	4	4355	1977	6	4349
1973	5	4280	1977	7	4349
1973	6	4160	1977	8	4349
1973	7	3835	1977	9	4349
1973	8	4149	1977	10	4349
1973	9	4276	1977	11	4349
1973	10	4366	1977	12	4349
1973	11	4456	1978	1	4349
1973	12	4546	1978	2	4349
1974	1	5149	1978	3	4349
1974	2	4956	1978	4	4349
1974	3	5005	1978	5	4349
1974	4	5199	1978	6	4349
1974	5	5072	1978	7	4349
1974	6	4959	1978	8	4349
1974	7	4696	1978	9	4349
1974	8	4594			

Table B.11

PRODUCTION RECRUITERS
NAVY

1970	7	1979	1974	9	3707
1970	8	2022	1974	10	3687
1970	9	2021	1974	11	3694
1970	10	2091	1974	12	3695
1970	11	2095	1975	1	3715
1970	12	2107	1975	2	3677
1971	1	2094	1975	3	3721
1971	2	2072	1975	4	3641
1971	3	2099	1975	5	3655
1971	4	2083	1975	6	3589
1971	5	2087	1975	7	3473
1971	6	2079	1975	8	3440
1971	7	2039	1975	9	3326
1971	8	2065	1975	10	3211
1971	9	2090	1975	11	3097
1971	10	2122	1975	12	3031
1971	11	2193	1976	1	3064
1971	12	2213	1976	2	3034
1972	1	2258	1976	3	3004
1972	2	2372	1976	4	3017
1972	3	2433	1976	5	2986
1972	4	2548	1976	6	2996
1972	5	2680	1976	7	2996
1972	6	2751	1976	8	2996
1972	7	2875	1976	9	2996
1972	8	3105	1976	10	2996
1972	9	3223	1976	11	2996
1972	10	3320	1976	12	2996
1972	11	3344	1977	1	2996
1972	12	3321	1977	2	2996
1973	1	3322	1977	3	2996
1973	2	3314	1977	4	2996
1973	3	3295	1977	5	2996
1973	4	3502	1977	6	2996
1973	5	3490	1977	7	2996
1973	6	3453	1977	8	2996
1973	7	3372	1977	9	2996
1973	8	3364	1977	10	2996
1973	9	3211	1977	11	2996
1973	10	3182	1977	12	2996
1973	11	3206	1978	1	2996
1973	12	3205	1978	2	2996
1974	1	3623	1978	3	2996
1974	2	3609	1978	4	2996
1974	3	3603	1978	5	2996
1974	4	3619	1978	6	2996
1974	5	3647	1978	7	2996
1974	6	3602	1978	8	2996
1974	7	3660	1978	9	2996
1974	8	3710			

Table B.12

PRODUCTION RECRUITERS
MARINE CORPS

1970	7	1295	1974	9	1865
1970	8	1291	1974	10	1865
1970	9	1290	1974	11	1865
1970	10	1292	1974	12	1865
1970	11	1310	1975	1	1865
1970	12	1281	1975	2	1865
1971	1	1283	1975	3	1865
1971	2	1288	1975	4	1865
1971	3	1281	1975	5	1865
1971	4	1264	1975	6	1865
1971	5	1262	1975	7	1865
1971	6	1272	1975	8	1865
1971	7	1303	1975	9	1865
1971	8	1323	1975	10	1826
1971	9	1359	1975	11	1766
1971	10	1406	1975	12	1766
1971	11	1406	1976	1	1773
1971	12	1442	1976	2	1773
1972	1	1554	1976	3	1773
1972	2	1561	1976	4	1773
1972	3	1615	1976	5	1773
1972	4	1647	1976	6	1773
1972	5	1708	1976	7	1773
1972	6	1719	1976	8	1773
1972	7	1661	1976	9	1773
1972	8	1638	1976	10	1773
1972	9	1683	1976	11	1773
1972	10	1665	1976	12	1773
1972	11	1664	1977	1	1773
1972	12	1674	1977	2	1773
1973	1	1686	1977	3	1773
1973	2	1522	1977	4	1773
1973	3	1670	1977	5	1773
1973	4	1738	1977	6	1773
1973	5	1731	1977	7	1773
1973	6	1610	1977	8	1773
1973	7	1695	1977	9	1773
1973	8	1685	1977	10	1773
1973	9	1832	1977	11	1773
1973	10	1832	1977	12	1773
1973	11	1832	1978	1	1773
1973	12	1832	1978	2	1773
1974	1	1950	1978	3	1773
1974	2	1921	1978	4	1773
1974	3	2015	1978	5	1773
1974	4	1865	1978	6	1773
1974	5	1865	1978	7	1773
1974	6	1865	1978	8	1773
1974	7	1865	1978	9	1773
1974	8	1865			

Table B.13

PRODUCTION RECRUITERS
AIR FORCE

1970	7	1536	1974	9	1808
1970	8	1513	1974	10	1808
1970	9	1514	1974	11	1852
1970	10	1511	1974	12	1877
1970	11	1511	1975	1	1803
1970	12	1472	1975	2	1869
1971	1	1494	1975	3	1869
1971	2	1444	1975	4	1869
1971	3	1438	1975	5	1869
1971	4	1447	1975	6	1869
1971	5	1468	1975	7	1869
1971	6	1477	1975	8	1781
1971	7	1488	1975	9	1693
1971	8	1586	1975	10	1605
1971	9	1588	1975	11	1593
1971	10	1619	1975	12	1605
1971	11	1619	1976	1	1605
1971	12	1746	1976	2	1586
1972	1	1819	1976	3	1568
1972	2	1948	1976	4	1554
1972	3	2001	1976	5	1530
1972	4	2021	1976	6	1530
1972	5	2034	1976	7	1530
1972	6	2002	1976	8	1530
1972	7	2036	1976	9	1530
1972	8	2012	1976	10	1530
1972	9	1994	1976	11	1530
1972	10	1995	1976	12	1530
1972	11	1973	1977	1	1530
1972	12	1967	1977	2	1530
1973	1	1959	1977	3	1530
1973	2	1932	1977	4	1530
1973	3	1905	1977	5	1530
1973	4	1892	1977	6	1530
1973	5	1868	1977	7	1530
1973	6	1847	1977	8	1530
1973	7	1886	1977	9	1530
1973	8	1866	1977	10	1530
1973	9	1879	1977	11	1530
1973	10	1869	1977	12	1530
1973	11	1869	1978	1	1530
1973	12	1869	1978	2	1530
1974	1	1912	1978	3	1530
1974	2	1951	1978	4	1530
1974	3	1810	1978	5	1530
1974	4	1810	1978	6	1530
1974	5	1816	1978	7	1530
1974	6	1805	1978	8	1530
1974	7	1793	1978	9	1530
1974	8	1790			

Table B.14

UNEMPLOYMENT RATE FOR MALES, AGED 16 TO 19
SEASONALLY ADJUSTED

1970	7	15.0	1974	9	17.2
1970	8	15.5	1974	10	16.6
1970	9	16.3	1974	11	17.4
1970	10	16.8	1974	12	18.1
1970	11	16.3	1975	1	19.4
1970	12	16.8	1975	2	19.9
1971	1	16.9	1975	3	19.9
1971	2	16.1	1975	4	20.9
1971	3	16.6	1975	5	20.1
1971	4	16.0	1975	6	21.5
1971	5	16.6	1975	7	21.3
1971	6	17.4	1975	8	20.9
1971	7	16.9	1975	9	19.7
1971	8	16.8	1975	10	19.8
1971	9	16.1	1975	11	18.8
1971	10	16.9	1975	12	19.5
1971	11	16.1	1976	1	19.7
1971	12	16.8	1976	2	19.2
1972	1	17.0	1976	3	19.2
1972	2	19.0	1976	4	20.5
1972	3	17.6	1976	5	19.5
1972	4	16.1	1976	6	17.6
1972	5	15.7	1976	7	18.4
1972	6	14.6	1976	8	18.6
1972	7	14.0	1976	9	19.2
1972	8	16.0	1976	10	19.6
1972	9	15.6	1976	11	19.5
1972	10	14.9	1976	12	19.2
1972	11	15.4	1977	1	17.3
1972	12	15.3	1977	2	18.6
1973	1	13.1	1977	3	18.6
1973	2	14.1	1977	4	17.5
1973	3	13.5	1977	5	17.4
1973	4	14.7	1977	6	17.5
1973	5	14.5	1977	7	16.9
1973	6	12.8	1977	8	17.4
1973	7	13.5	1977	9	17.7
1973	8	13.7	1977	10	16.7
1973	9	14.1	1977	11	16.4
1973	10	14.0	1977	12	15.3
1973	11	14.4	1978	1	14.9
1973	12	14.1	1978	2	17.2
1974	1	13.8	1978	3	17.1
1974	2	14.4	1978	4	16.6
1974	3	14.4	1978	5	15.3
1974	4	14.4	1978	6	12.6
1974	5	14.7	1978	7	15.4
1974	6	15.3	1978	8	14.7
1974	7	15.5	1978	9	15.8
1974	8	14.8			

Appendix C

COMPARISON WITH PREVIOUS PROJECTIONS

In 1978 Rand undertook the projection of accession levels for each of the four services through 1990.[1] The current work differs in many details of data and methodology, as well as the obvious difference of the inclusion of more recent data, from this earlier study. It seems worthwhile, therefore, to compare the two studies and their projections to determine how much of the differences in projected accession levels can be accounted for by procedural differences and how much by the addition of new observations.

The principal procedural differences between the two studies are summarized in Table C.1. In addition to these, the projected economic scenarios differed somewhat, although for the middle case (which Grissmer called "less vigorous expansion") the aggregate unemployment rates are identical for 1984 and beyond. For this middle case only, Grissmer's projections for high school graduates in mental categories I, II, and III are reproduced in Tables C.2 through C.5.

As can easily be seen, the Grissmer study projects enlisted accession levels much higher than does the current work, especially if the comparison is made with the probably more realistic Case B (see Section III). An obvious and intuitively appealing approach to explaining these differences is to reestimate the current supply

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[1] David W. Grissmer, "Army Supply Projections - 1977-1990," and "Navy, Marine Corps and Air Force Supply Projections - 1977-1990," unpublished manuscripts, undated.

Table C.1

COMPARISON OF DATA AND METHODOLOGY

	Old	New
Estimation Period	July 1970-February 1977	July 1970-September 1978
Functional Form	Log-log	Linear
Lags	Pay and unemployment lagged zero, two, or six months	No lags for pay and recruiters. For unemployment, current month and 11 preceeding months included.
Estimation Procedure	Ordinary least squares	Cochrane-Orcutt iterative
Projection Groups	HS/NHS - mental categories I & II, III, & IV	HS, mental categories I & II, IIIA, and IIIB
Accession Data	GRC--includes adjustment in immediate post-draft years for depleted population pools	GRC--1970:7 - 1972:12 DMDC--1973:1 - 1978:9
Population Data	Civilian population by individual age, 17-23	Total population by individual age, 17-21, adjusted for numbers who have served or are serving
Civilian Pay	Average annual earnings of year-round full-time male workers--weighted average of ages 16-19 and 20-24	Average weekly earnings in total private economy, seasonally adjusted
Unemployment Data	Rate for males, 16-21, whose major activity is other than school	Rate for all males, 16-19, seasonally adjusted
Recruiter Data	None	Production recruiters

Table C.2

ARMY SUPPLY PROJECTIONS-GRISSMER
HIGH QUALITY HIGH SCHOOL GRADUATES
LESS VIGOROUS EXPANSION

Year	I & II	III	Total
1978	29645	44118	73763
1979	29452	43682	73134
1980	29217	43233	72450
1981	28952	42741	71693
1982	28384	41752	70136
1983	27581	40571	68152
1984	26748	39346	66094
1985	25890	38082	63972
1986	25203	37037	62240
1987	24829	36523	61352
1988	24885	36604	61489
1989	24686	36312	60998
1990	24312	35762	60074

Table C.3

MARINE SUPPLY PROJECTIONS-GRISSMER
HIGH QUALITY HIGH SCHOOL GRADUATES
LESS VIGOROUS EXPANSION

Year	I & II	III	Total
1978	9551	14217	23768
1979	9285	13928	23213
1980	9077	13686	22763
1981	8861	13432	22293
1982	8491	12975	21466
1983	8251	12608	20859
1984	8002	12227	20229
1985	7745	11835	19580
1986	7539	11521	19060
1987	7428	11350	18778
1988	7444	11375	18819
1989	7385	11285	18670
1990	7273	11114	18387

Table C.4

NAVY SUPPLY PROJECTIONS-GRISSMER
HIGH QUALITY HIGH SCHOOL GRADUATES
LESS VIGOROUS EXPANSION

Year	I & II	III	Total
1978	29256	29112	58368
1979	28893	28900	57793
1980	28547	28655	57202
1981	28172	28381	56553
1982	27446	27802	55248
1983	26670	27015	53685
1984	25864	26200	52064
1985	25034	25358	50392
1986	24370	24686	49056
1987	24008	24320	48328
1988	24062	24374	48436
1989	23870	24179	48049
1990	23508	23813	47321

Table C.5

AIR FORCE SUPPLY PROJECTIONS-GRISSMER
HIGH QUALITY HIGH SCHOOL GRADUATES
LESS VIGOROUS EXPANSION

Year	I & II	III[a]	Total[a]
1978	27221	43815	71036
1979	26988	43440	70428
1980	26735	43033	69768
1981	26455	42583	69038
1982	25880	41657	67537
1983	25148	40478	65626
1984	24389	39256	63645
1985	23605	37996	61601
1986	22979	36988	59967
1987	22639	36439	59078
1988	22689	36521	59210
1989	22508	36229	58737
1990	22167	35681	57848

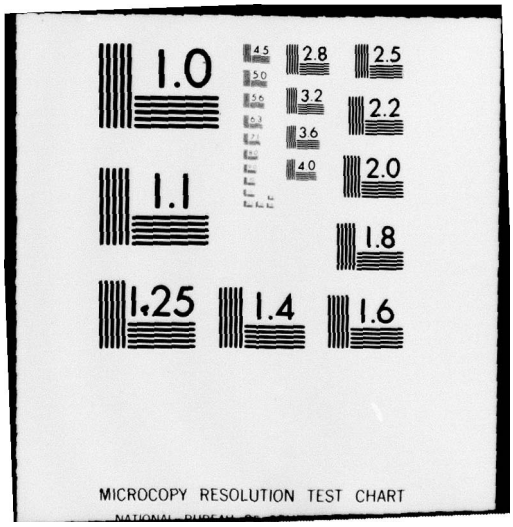
[a]Grissmer assumed that Air Force category III accessions were demand determined. Thus, these category III and total projections are not comparable to those of the current work.

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5.0
5.6
MICROCOPY RESOLUTION TEST CHART

functions using the sample period and economic scenarios of the Grissmer study, and to compare the resultant projections with Grissmer's. This approach was followed, and the comparisons for selected years are reported in Table C.6. Also reported are the differences when the recruiter variable is omitted in the reestimation.

It is tempting to conclude that the changes in data and methodology from the earlier study to the current account for an appreciable portion of the decline in projected accession levels. To do so, however, is to ignore the magnitudes of the estimated standard errors of the current projections. Given these magnitudes, the differences of Table C.6 do not appear statistically significant. That is, we cannot view Table C.6 as supporting the hypothesis that the differences in data and methodology have resulted in differences in projections.

One exception to this point should be noted. A comparison of Grissmer's estimated elasticities, given in Table C.7, with those of the current work (Table 5), reveals consistently higher unemployment elasticities for the latter. This is probably in large part because a distributed lag formulation is used here for the unemployment variable (see Section II). The effects of the larger unemployment elasticities are seen in Table C.6: The Grissmer method projects consistently smaller declines in accessions between 1979 and 1984--a period of assumedly falling aggregate unemployment--than those projected under the current method.

In summary, it appears that rather different variable specifications yield equally good (or equally bad) measures of the forces determining accessions over time. Even the choice of functional form seems to make little difference, probably because of the limited

Table C.6

METHODOLOGY COMPARISON
PERCENTAGE DIFFERENCE BETWEEN PROJECTIONS BASED
ON NEW METHODOLOGY AND DATA, AND GRISSMER'S PROJECTIONS[a]

	I & II		III	
	With RECR	Without RECR	With RECR	Without RECR
Army				
1979	2.54	2.77	-5.68	1.35
1985	1.10	1.34	-6.09	1.44
Navy				
1979	-3.71	0.67	-4.42	3.78
1985	-7.45	-1.96	-6.07	4.76
Marines				
1979	-3.86	-4.58	-9.41	-0.52
1985	-5.93	-6.52	-10.10	-0.42
Air Force				
1979	-2.47	2.95		
1985	-7.91	-1.71		

[a]Positive values indicate new projections greater than Grissmer's, and negative values the reverse. All projections are based on equations estimated with data from the period July 1970 to February 1977 and on Grissmer's "less vigorous expansion" economic scenario.

Table C.7

GRISSMER ELASTICITY ESTIMATES

	PAY	UNEM
Mental Categories I & II		
Army	.573	.199
Navy	.733	.460
Marines	.640	1.147
Air Force	.404	.289
Mental Category III		
Army	1.113	.348
Navy	.939	.232
Marines	.446	.812
Air Force	.548	-.376

range of variation of both the dependent and independent variables during the period studied. If the projections reported here turn out to be inaccurate, improvements will apparently require much more fundamental changes in methodology.

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