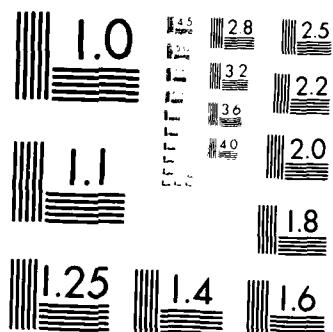END

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ACTIVE ENLISTED SUPPLY: PROSPECTS AND POLICY OPTIONS

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March 1984

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I. INTRODUCTION

In 1978, on the eve of the sixth anniversary of the All Volunteer Force, the Department of Defense study *America's Volunteers* summed up the prospects for the AVF in the years ahead:

> The major problems for the active force of the AVF lie in the prospective decline in the population of youths of recruiting age. The population declines 15% between 1980 and 1985 and about 25% by the early 1990s. Moreover, economic changes and other changes could compound these effects.[1]

Even as the report was being issued, the active services were experiencing recruiting shortfalls that by the end of fiscal year 1979 totaled 7 percent of the year's requirement. Enlistment supply studies suggested that the situation was not going to improve. Retention rates at the first and second reenlistment points were also falling, raising the possibility that career force strength might overshadow recruiting as the major problem area for military personnel policy. At the same time, it was becoming apparent that scores on the Armed Services Vocational Aptitude Battery (ASVAB), the test administered to all applicants to determine their suitability for military service, had for several years been erroneously inflated.[2] These three events-- recruiting shortfalls, plummeting retention rates, and the ASVAB scoring error--exacerbated fears that the services would fail to attract and retain enough high-aptitude individuals to meet the requirements of the modern military.

Fortunately, more recent events have sharply modified this pessimistic view. Retention rates have risen to new highs, and Army recruiting, a notable problem area in the late 1970s, has improved dramatically. A few years ago predictions of a return to peacetime conscription by the mid-1980s were common. Many now believe that goals for military personnel strength and quality can be achieved, provided the nation maintains its commitment to keeping military compensation, broadly construed, competitive with civilian compensation.

In this paper we show how the forces shaping enlisted supply in the 1980s will affect the services' abilities to attract and retain the numbers and types of individuals they want. We give special attention to the Army because its past recruiting problems have sparked greatest concern. For both DoD (all services together) and the Army, we present forecasts of high-quality male enlistments, of first- and second-term retention rates, and of the enlisted force structure. We also examine some alternative policy options for dealing with problems that our forecasts might suggest. We do not analyze whether the forecast force structure is the most cost-effective, nor do we treat the effects of changes in the military retirement system on accessions and retention. The retirement system is currently under study by the Fifth Quadrennial Review of Military Compensation.

A schematic of our forecasting approach appears in Figure 1, which also serves as a guide to the major sections of this paper. We begin (Sec. II) by discussing the major forces affecting the supply of enlisted personnel in the 1980s. Projections of youth population trends, the civilian wage structure, the unemployment rate, and two alternative paths of military pay increases, form the basis of our two principal scenarios. Using two forecasting models, we predict high-quality male enlistment levels and first- and second-term retention rates (Sec. III). These feed into a model that forecasts the future distribution of the enlisted force by year of service. We compare this force structure with today's. The model also forecasts accession requirements, allowing us to examine the extent to which those requirements can be met from high-quality enlistments. Next we discuss (Sec. IV) selected policy options that could be used if the predicted enlistment levels, retention rates, and force structures deviate from those desired. Our models could be used to track the effects of these policy changes through the rest of the circle, although that is not done in the current paper. The final section (Sec. V) gives our principal conclusions, and indicates areas in which further analysis would be particularly useful.
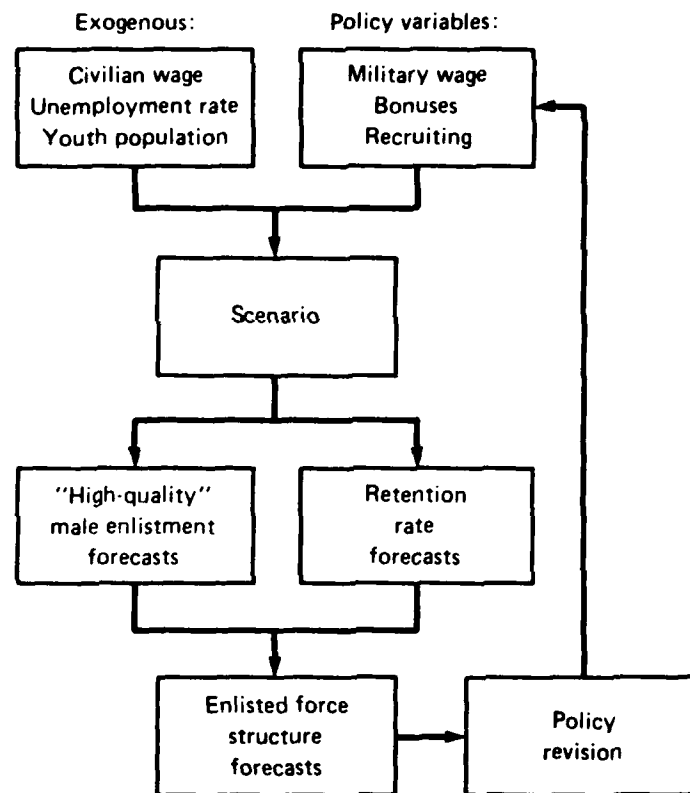
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          Exogenous:              Policy variables:

    ┌─────────────────────┐    ┌─────────────────────┐
    │   Civilian wage     │    │    Military wage    │
    │ Unemployment rate   │    │      Bonuses        │
    │  Youth population   │    │     Recruiting      │
    └─────────────────────┘    └─────────────────────┘
                │                          │
                └──────────┐     ┌─────────┘
                           ▼     ▼
                    ┌─────────────────────┐
                    │                     │
                    │      Scenario       │
                    │                     │
                    └─────────────────────┘
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                ┌──────────┴──────────┐
                ▼                     ▼
    ┌─────────────────────┐    ┌─────────────────────┐
    │   "High-quality"    │    │     Retention       │
    │  male enlistment    │    │       rate          │
    │     forecasts       │    │     forecasts       │
    └─────────────────────┘    └─────────────────────┘
                │                          │
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                           ▼
            ┌─────────────────────┐    ┌─────────────────────┐
            │   Enlisted force    │    │                     │
            │     structure       │──▶ │       Policy        │
            │     forecasts       │    │      revision       │
            └─────────────────────┘    └─────────────────────┘
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Fig. 1 — Schematic of forecasting approach

II. FORCES AFFECTING SUPPLY IN THE 1980S

Forecasting enlistments and retention requires an understanding of the forces that will be operating to affect individual decisions in the future. Four factors seem particularly important through the end of the decade: the decline in youth population, the improvement in the economy, possible changes in the ratio of military to civilian pay, and a coming change in the age structure of civilian pay. After describing these factors, we combine them into scenarios for our forecasting.

THE FACTORS

Youth Population Decline. Throughout the 1970s the number of young people reaching enlistment age rose steadily; during the 1980s the trend reverses. The Census Bureau projects 12 percent fewer 17-to-21-year-old males in 1990 than there were in 1983. This should translate into a decline in enlistments, but as our forecasts suggest the decline may be less than equiproportionate.

Improving Economy. The economic recovery, begun over a year ago, is expected to continue over the next few years. Forecasts of the speed of recovery made as recently as the spring of 1983 have proved too pessimistic; the adjusted forecasts we utilize were made by the Congressional Budget Office in August 1983. These cover the period 1983-1986; for 1987-1990 we have roughly interpolated between CBO's older optimistic and regular scenarios. Our unemployment series shows a persistent, gradual recovery, with unemployment falling from 9.7 percent in 1983 to 6.8 percent in 1988, and holding there through 1990. Given recent years of high unemployment, the 6.8 percent figure may seem too bullish, but as recently as 1977 the rate was under 6 percent, and it stood at 4.8 percent when the AVF began in 1973.

The future of the economy is, of course, very difficult to predict. Although the recovery may continue for several years, a new recession is certainly a possibility before the end of the decade. The declining unemployment rates that we assume should make enlistment and retention goals harder to achieve, other things equal, but a new rise in unemployment could reverse this trend.

Military/Civilian Pay Ratio. We specify two alternative pay series that should bracket the plausible range of variation in the military/civilian pay ratio. The first shows slower growth in military pay than in civilian, as occurred over the past two years and in the late 1970s--relative pay fell by 8 percent between 1976 and 1979.[3] Our series assumes a fall similar to that of the late 1970s, with military pay rising by about 2 percentage points less than civilian in each year from FY85 through FY87. Given the research evidence (and belief in Congress) that low pay contributed to the recruiting difficulties in the late 70s, one might think that this pay scenario would not materialize. Yet the same could have been said in 1973 of the pay history of 1976-1980.

The second series specifies that the FY85 military pay raise will match the average change in civilian pay, as will the raise in FY87 and beyond. For FY86, the budget cycle after the coming Presidential election, we assume a "catch-up" raise, offsetting the relative pay declines brought about by the 4 percent raise in FY83 and the delayed 4 percent raise in FY84.[4]

Civilian Pay Structure. Although it is widely known that the youth population will decline steadily through the mid-1990s, it is less well understood that the changing youth cohort size should affect the structure of civilian pay. The large influx of young workers in the 1970s forced their wages to fall relative to the average wage over all workers. This trend will reverse during the 1980s and into the 90s. As the proportion of youth in the labor market declines, their wages will tend to increase relative to the average wage. New entrants to the labor force will feel this effect first and most strongly. The wage increase will be smaller in size and later in coming for somewhat more experienced workers.

Recent Rand work has developed estimates of the effect of cohort size on wages.[5] Based on this work, Figure 2d (below) shows what will happen to the wages of recent high school graduates relative to the average wage across all education and experience groups. The high school graduates are divided into three experience groups: two years or less, three to five years, and six to nine years. These three groups

approximate the civilian wage trends relevant to the points of
enlistment, first-term reenlistment, and second-term reenlistment. By
extension, the figure also shows by how much military pay will fall
behind civilian at these three points if across-the-board military pay
increases match the rise in average civilian pay. For instance, the
estimates indicate shortfalls in 1990 of about 5 percent, 3 percent, and
less than 1 percent, for the three points respectively.

THE SCENARIOS

Table 1 and Figure 2 summarize the historical and projected values
of youth population, the unemployment rate, and the military/civilian
pay ratio. They define two scenarios, "low pay" and "high pay," based
on the two alternative pay series. The youth population and
unemployment rate series are common to the scenarios. The separate
panels in Fig. 2 for youth population, the unemployment rate, and the
military/civilian wage ratio show that these variables were at or near a
peak in FY82-83. Population and unemployment are expected to return to
the range observed in the recent past, FY1977-1981, but the path of
relative pay depends on the scenario. The figure also includes a panel
showing the change in the civilian wage structure, as discussed above.
In generating our forecasts (Sec. III), we use these relative pay
changes to adjust the military/civilian pay ratios shown here, creating
separate pay series for the enlistment, first reenlistment, and second
reenlistment points.

Table 1

HISTORICAL AND PROJECTED PATHS OF FACTORS AFFECTING ENLISTMENTS
AND RETENTION IN THE 1980S

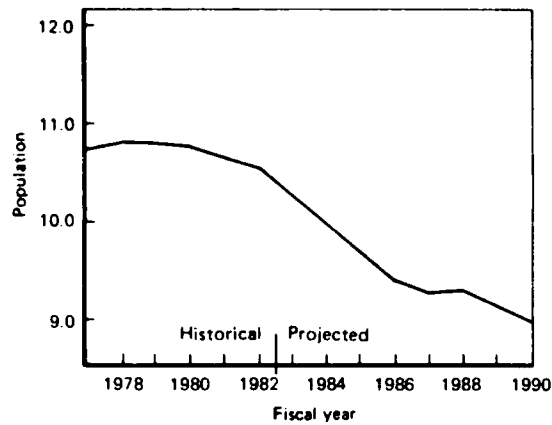| Fiscal Year	Male Youth Population[a]	Unemployment Rate (percent)[b]	Military/Civilian Pay Ratio[c]	
			Low[d]	High[e]
Historical				
1977	10,720	7.5	.95	
1978	10,826	6.4	.93	
1979	10,809	6.1	.90	
1980	10,758	7.1	.89	
1981	10,686	7.7	.90	
1982	10,524	9.4	.97	
Projected				
1983	10,229	10.9	.97	.97
1984	9,918	10.2	.93	.93
1985	9,602	9.2	.93	.95
1986	9,334	8.4	.92	1.00
1987	9,204	7.6	.90	1.00
1988	9,225	6.8	.90	1.00
1989	9,139	6.8	.90	1.00
1990	9,000	6.8	.90	1.00

[a]17 to 21 year old males, including Armed Forces overseas,
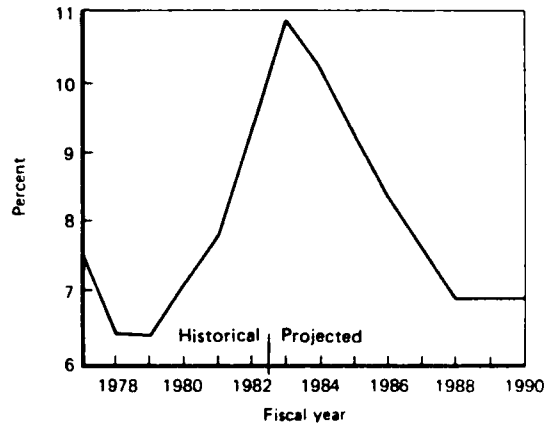   in thousands.
[b]For total labor force.
[c]Index: Oct. 1, 1981 = 1.00. Pay figures shown refer to
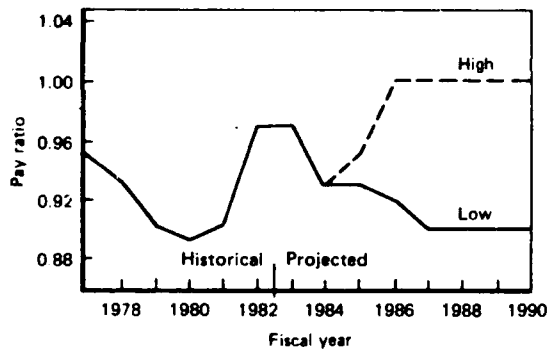   mid-fiscal year.
[d]Assumes no FY86 catch-up
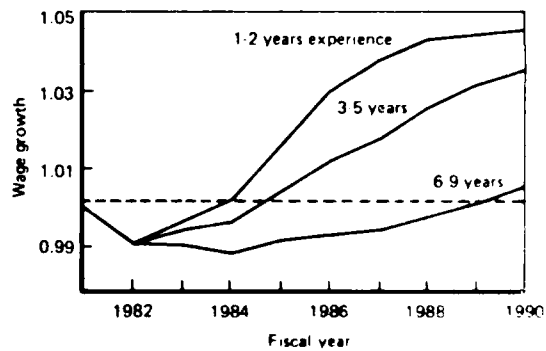[e]Assumes FY86 catch-up

2a. Male youth population age 17-21 (millions)

2b. Unemployment rate (percent)

2c. Military/civilian pay ratio

2d. Projected civilian male wage growth. Youth relative to average (Index 1981 = 100)

Fig. 2 — Recent and forecast paths of key variables

III. FORECASTS

This section presents enlistment and retention forecasts based on the two scenarios described in the previous section. Extending the traditional assessment method, we also trace the effects of these future levels and rates on the enlisted personnel force structure through the end of the current decade. This new analysis makes it clear that the transition from compulsory service to a volunteer force--even now only half completed--is profoundly affecting the force structure, so much so that, notwithstanding the declining youth cohort size and recovering economy, the traditional concern with recruiting should diminish in the 1980s

The forecasts derive from models of enlistments, retention, and force structure, that were developed at Rand.[6]

ENLISTMENTS

The enlistment model relates the enlistment rate for "high quality" males to measures of the military/civilian pay ratio, the state of the economy, the numbers of recruiters, and indicators for important policy changes (such as the introduction of the Army College Fund). The model is estimated separately for each service using monthly data. For the current forecasts these data cover the years 1975 to 1981. The estimation methodology explicitly allows for the tendency of enlistment rates in different states, and different services, to move together.

The model assumes that the number of "high-quality" male recruits-- high school graduates who score in the upper half of the AFQT--depends solely on the willingness of such individuals to enlist (their "supply" behavior), and not on the services' willingness to have them ("demand"). This assumption is a primary reason why studies of enlistment supply have focused on the high-quality group. The Army forecasts have been adjusted, however, to reflect the effects of a new system of recruiter incentives and recruiting quotas that was introduced during 1981. This change contributed to an unprecedented increase in Army high-quality enlistments between FY81 and FY82. Recent analysis has confirmed the link between the Army's changed recruiting policies and the subsequent

projections demonstrate the liklihood of a movement toward a more senior force over the remainder of the decade. In the final section of this paper (Sec. V) we consider whether the shift to a more senior force is desirable, and how such a force can be managed. Consideration of such questions, however, requires an understanding of the policy options available for changing the force structure, the subject of the next section.

Recent changes in military pay, unemployment, and reenlistment bonuses will also contribute to the development of a more senior force over the next seven years. Between FY79 and FY82 our military/civilian pay series grew from .90 to .97, and the unemployment rate rose from 6.1 percent to 9.4 percent. During the period FY79 to FY81 the proportion of first-term reenlistees covered by bonuses rose from 36 to 40 percent. At the second reenlistment point the coverage increase was even greater: from 22 to 42 percent. The average reenlistment bonus also rose, from $2,700 to $3,900 (in constant 1976 dollars) at the first reenlistment point and from $5,200 to $5,800 at the second reenlistment point. These changes helped boost retention rates to all-time highs. From 25.6 percent in FY77-78 the first-term retention rate had climbed to 38.6 percent in FY81-82. This increase was not due to the shift to an all-volunteer force, for since FY77-78 virtually everyone reaching the first-term reenlistment decision point has been a true volunteer.

In addition to the upsurge in retention rates, the level of accessions in the mid and late seventies was high. Large numbers of new enlistees were required to maintain overall force strengths in the mid seventies because the higher retention rates of the AVF had not yet fully manifested themselves. The decline in retention rates from FY77 through FY79 further fed the demand for accessions. This decline can in part be attributed to a fall in the military/civilian pay ratio and an improvement in national employment conditions (see Fig. 2).

The high accessions levels of the mid and late 1970s have combined with the recent high retention rates to create a relatively large stock of personnel in their second and third terms of service. These second- and third-term personnel, present in our benchmark year (FY82), constitute a major factor in the evolution toward a more senior force. The large stock of mid-career personnel in the 1982 enlisted force can be viewed as the product of the shift to an all-volunteer force, the rapidly rising retention rates of the last few years, and the large accession cohorts of the late seventies. In addition, the stock of personnel nearing the end of their first terms, in conjunction with high current first-term reenlistment rates, present further potential for senior force growth. Within this context, our force structure

The major reason for the common misperception of the AVF's sustainability appears to be a preoccupation with accession supply rather than the match between supply and demand.[16] The focus of policy concern and analysis has been the projected decline in supply resulting from the coming decline in youth cohort sizes and, more recently, from the expected recovery of the civilian economy. The even larger potential decline in accession requirements, however, has been overlooked.

The enlisted force has quietly evolved a solution to the accession supply problem by retaining people at historically unprecedented rates, thus reducing the demand for new enlistees. This tradeoff, substituting greater stocks of experienced personnel for the large flows of junior personnel through the first term that were characteristic of the draft years, has been taking place for a number of years. A good portion of the high retention can be attributed to four factors: the change to an all-volunteer force, recent increases in military/civilian compensation, the worsened national employment conditions, and increases in the coverage and level of reenlistment bonuses.

The change to an all-volunteer force is important because true volunteers can be expected to reenlist at a higher rate than draftees or draft-motivated volunteers. As a result, the retention experience since FY77-78, by which time virtually all of those reaching the first reenlistment point had entered after the draft ended, is better than it would have been under a pre-AVF type force. The actual increase in retention attributable to the AVF concept is difficult to quantify. However, we can gain a rough idea by examining the retention rate for enlisted personnel in the fourth year of service who are approaching their reenlistment decision point. (These refer to all personnel, not just the subgroup used for illustration above.) In FY71-72 the average rate was 13.0 percent; in FY77-78 it was 25.6 percent.[17] This near doubling in first-term retention created a "bow wave" of personnel moving toward the senior force. We are now seeing that wave penetrate the ten-plus year of service group.

relative to FY82 and 9 percent relative to FY76-82. Army data show
slightly higher percentage declines. The forecast declines in
requirements would keep accession quality comparable to that of the
excellent recruiting year of FY82 under both pay scenarios,
notwithstanding the youth cohort decline and falling unemployment rates.
A marked improvement would occur under the higher pay scenario.

These results raise a number of policy issues with respect to
enlisted force manning over the next seven years, as well as the
question of how the current situation has evolved and attracted so
little notice. If accurate, the projections show that the AVF is
definitely sustainable through 1990 under current force sizes and the
assumed pay conditions. Further, accession quality can be maintained
above historical levels despite declines in the youth cohort and
unemployment. This view of the AVF's future sharply contrasts with
recent assessments of the AVF.[15] We conclude this section by examining
the reasons for the disparity between our results and other assessments.

Table 3

COMPARISONS OF FIRST-YEAR ENLISTED PERSONNEL
REQUIRED TO MAINTAIN END STRENGTHS

	Historical		Projected FY90	
	FY76-82 Average	FY82	Low Pay Scenario	High Pay Scenario
DoD				
Personnel (000s)	307	292	279	241
% high quality	43.7	48.8	45.8	56.1
Army				
Personnel (000s)	133	110	101	92
% high quality	28.6	34.6	46.7	53.8

NOTE: Accession requirements would be somewhat greater
than the numbers shown here because of losses
during the first year.

The forecasts (Table 2) show enlisted force dynamics being dominated in the next seven years by a very dramatic increase in the size of the senior career force--if current personnel policies continue. The number of DoD enlisted personnel with ten or more years of service will increase by 35 and 42 percent between FY82 and FY90 under the low and high pay scenarios, respectively. For the Army the percentage growth in the senior career force is even larger--59 percent under the low pay scenario and 69 percent under the high pay scenario.

The dramatic increase in senior career force manning, if allowed to occur, will reduce FY90 nonprior service accession requirements to levels well below those of the recent past (Table 3). This is true for both DoD and the Army and under both pay scenarios. The high pay scenario shows an FY90 DoD requirement for nonprior service accessions 18 percent below the FY82 level and 22 percent below the average level for FY76-82. Under the low pay scenario the drop would be 5 percent

Table 2

ENLISTED EXPERIENCE MIX COMPARISONS, FY82-90

Year of Service	FY82	Low Pay Scenario		High Pay Scenario	
		FY90	% Change	FY90	% Change
DoD					
1-2	578	528	-8.7	458	-20.8
3-5	534	436	-18.4	414	-22.5
6-9	267	274	+2.6	336	+25.8
10+	408	549	+34.6	580	+42.2
Total	1787	1787		1787	
Army					
1-2	233	191	-18.0	173	-25.8
3-5	204	171	-16.2	159	-22.1
6-9	109	108	-.9	124	+13.8
10+	129	205	+58.9	218	+69.0
Total	674	674		674	

NOTE: Numbers in thousands. They may not sum to totals because of rounding.

Our assumption of an accession-managed end strength leads to predicted overall annual accession requirements, but does not specify the makeup of the accession groups. Assumptions are necessary as to the mix between prior service and nonprior service and the characteristics of the enlistees within each of these two groups. We assume annual levels of prior service accessions and of nonprior service female accessions equal to those in the services' current five year plans.[13] For male nonprior service accessions we assume that high-quality enlistments are given by the forecasts presented above (options for expanding this supply are discussed in Sec. IV). The remainder of the accession requirement is filled by a mix of lower-quality males determined by historical enlistment levels and by apparent service preferences.[14]

The above assumptions enable the force structure forecasting model to predict the experience distribution of the force, the nonprior service accession requirement, and the quality mix. We have produced forecasts for every year from FY83 to FY90. But for brevity we display only the FY90 structure and compare it with the structure existing in FY82, the last year for which complete data were available. We do not mean to imply that the structure in FY82 should be preferred to any other; rather, it provides a timely and tangible basis for comparison.

We represent a personnel force structure by the percentages of active duty personnel in four year-of-service categories: one to two years, three to five, six to nine, and ten or more. The first group consists of personnel largely occupied with basic and advanced training, or in their first duty assignments but not yet performing at journeyman level. The second and third groups correspond approximately to trained personnel in their first and second terms of service. The last group contains the senior careerists, individuals in their third terms and beyond whose jobs might comprise supervisory and managerial functions as well as direct skill-related tasks. The accession requirement that the structure implies we divide into two portions: that filled by high-quality males and females (based on the enlistment forecasts and an assumed quality mix among females), and that filled from other sources. This gives a simple picture of the quality mix.

PERSONNEL FORCE STRUCTURE

The retention forecasts, coupled with the delayed effects of rising retention rates during the past ten years, imply striking changes in the experience mix of the enlisted force. Changes in the experience mix of the force, while holding force size constant, mean changes in force costs, productivity, and force effectiveness. A more senior force, for example, would bring higher current compensation costs, greater future retirement benefit payments, and increased current costs of certain benefits such as medical and housing. It would also likely exhibit greater productivity and force effectiveness, as fewer personnel would be involved in initial skill training activities and the average enlisted person would have more job experience. Determining the "optimal" experience mix therefore means striking the right balance between productivity and effectiveness on the one hand and costs on the other. We do not attempt to determine the proper balance, but report the prospective changes in the experience mix and some of their implications.

Before discussing our force structure forecasts, we want to describe several important assumptions underlying the forecasts which will aid in their interpretation. Congress establishes an "end strength" *ceiling* for each service, specifying a required strength level as of the last day of the fiscal year. We assume that these end strength ceilings will stay constant at their FY82 levels through FY90,[12] and that the services will be able to meet their end-strength objectives as they have in the past. The services adjust their end strengths by controlling the flows of accessions and losses throughout the year. In practice, adjusting the flow of accessions is much easier and offers greater flexibility for making large short-term adjustments, so accession management is the most common short-term tool for meeting end strength objectives. For this reason, and because of our interest in exploring the consequences of a continuation of current policies, we assume for our forecasts that annual accessions will be adjusted to levels sufficient to meet end-strength goals. Thus, we ignore short-term policy adjustments that could affect losses, such as changes in reenlistment eligibility standards, promotion rates, or "early out" policies.
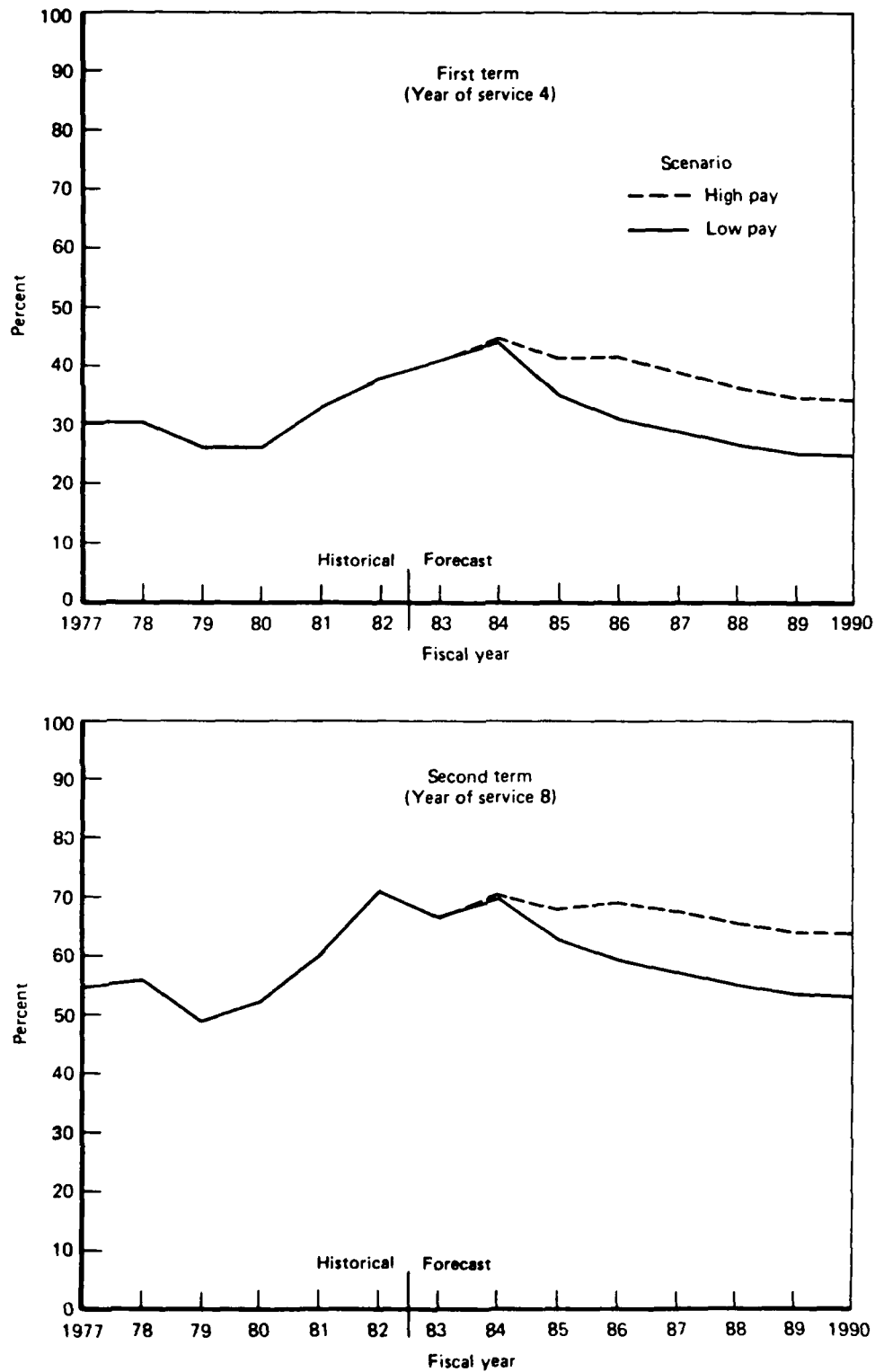
Fig. 5 — Actual and projected retention rates for Army,
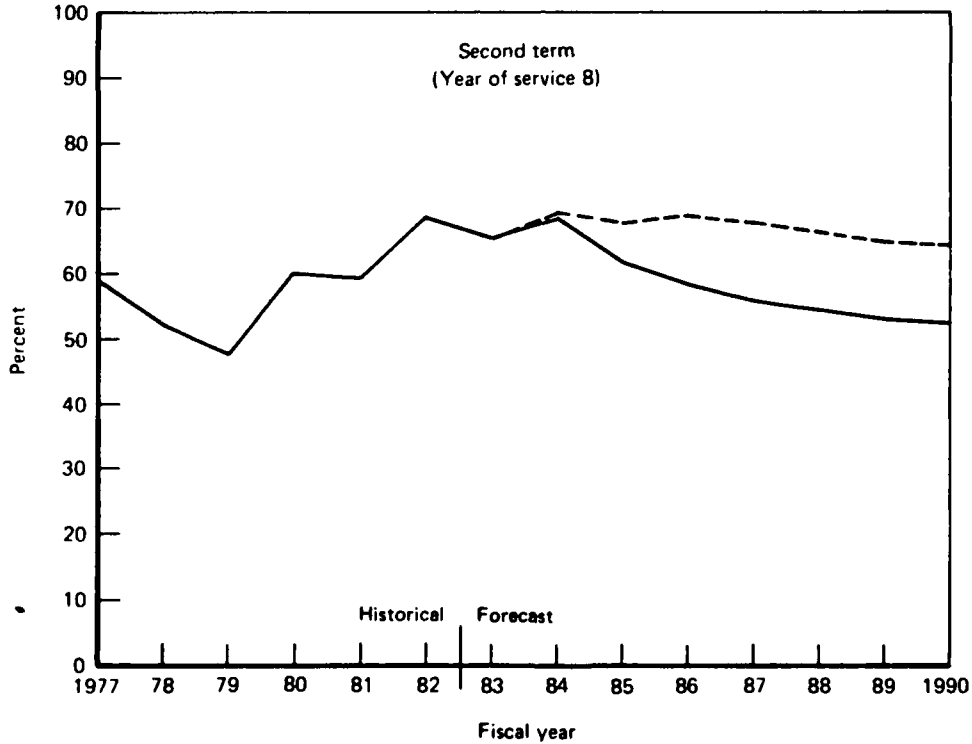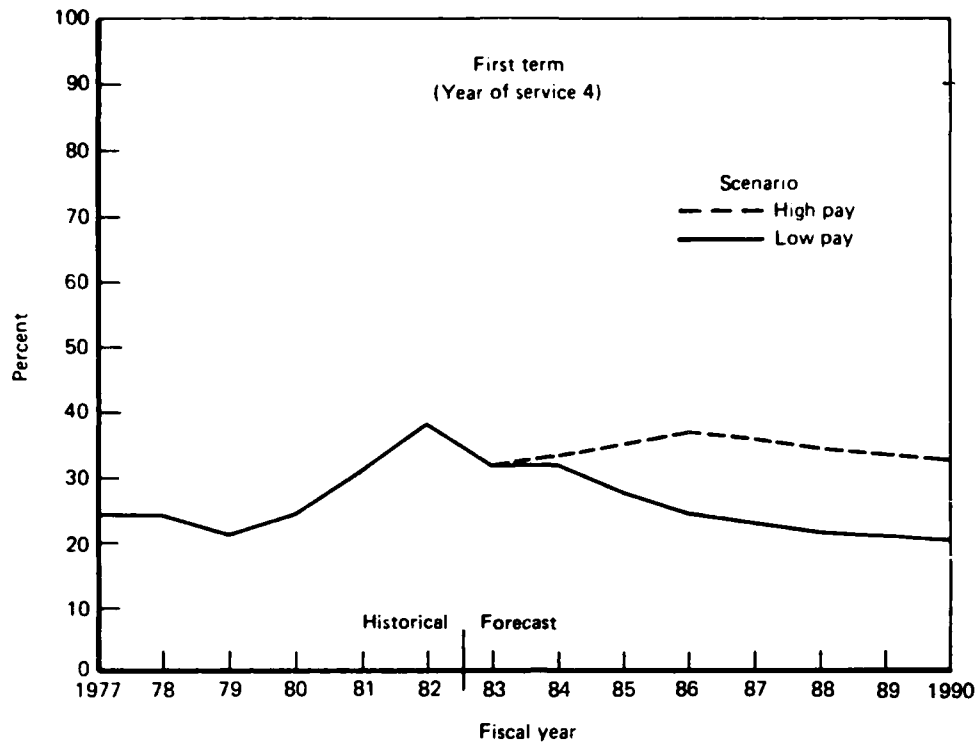white male high school graduates

Fig. 4 — Actual and projected retention rates for DoD,
white male high school graduates

recovered strongly. For instance, the first-term DoD retention rate goes from 24 percent (FY77) to 22 percent (FY79) to 38 percent (FY82)--a remarkable increase.

Over the forecast period, FY83-FY90, we observe sizable declines under the low pay scenario. Improving employment conditions and declining relative pay reduce the first-term DoD retention rate from 32 percent in 1983 to 21 percent in 1990, a drop of one-third. The higher pay scenario, in contrast, shows a modest near-term rise followed by a decline to 33 percent in 1990.[11] In other words, the high pay scenario sustains the robust retention climate of 1983.

The story for second-term retention is much the same. The low pay scenario diminishes the second-term retention rate from a forecast value of 66 percent in 1983 to 53 percent in 1990. The high pay scenario increases the rate from 66 percent to 69 percent in 1986, after which the rate declines to 65 percent in 1990.

The Army pattern (Fig. 5) follows DoD forecasts closely, although the first-term decline is a little more rapid. Under the low pay scenario first-term retention falls from 41 percent in 1983 to 25 percent in 1990--from one in every 2.4 men remaining to one in every 4.0. The rate drops only to 35 percent in 1990, however, under the high pay scenario. The second-term retention rate falls from a forecast 66 percent in 1983 to 54 percent (low pay) or 64 percent (high pay) by 1990.

In sum, the high pay scenario works toward maintaining the current prosperity of the force in retaining first- and second-term personnel. The scenario suggests that their retention rates may actually increase in the near term. Contrasting with the higher pay results, the low pay scenario produces retention rates so low as to raise serious concern about maintaining force strength in the mid-career years. The implications of the two scenarios for the personnel force structure are examined below.

RETENTION RATES

Movements in retention rates,[9] especially the first-term retention rate, carry implications for the ability of the AVF to meet its career manning requirements. The active duty military relies on new recruits for nearly all of its manpower. Because little lateral entry occurs, a decline in retention rates can create a shortage of trained, experienced personnel. Such a shortage would have to be accommodated by modifying personnel assignments as well as the pace of military operations and maintenance. Reduced retention rates would also trigger an increase in accession requirements, which while helping to maintain overall force strength would not solve the immediate problems raised by the shortage. Anticipating a shortage, then, and acting to prevent it would obviously be preferable to seeing one materialize.

To forecast retention rates, we use models of first- and second-term retention behavior. The models, estimated separately for DoD and for the Army, relate occupation-specific retention rates to explanatory variables that include the military/civilian pay ratio, the unemployment rate, the presence and level of a reenlistment bonus, whether the bonus was lump sum or installment, the percent nonwhite, and the percent without a high school education. The data cover the period from mid-FY76 to the end of FY81. By setting the demographic variables at appropriate values, we produced forecasts of the retention rates for four subgroups of male enlisted personnel (whites, nonwhites by high school, non-high school). These rates later feed into a model used to project enlisted force structure (see below).[10] Also, in obtaining the forecasts, we set the bonus variables, which are not a feature of the scenarios, at their average values for the period FY77-FY81.

To illustrate the historical and projected changes in first- and second-term retention rates, we focus on a single subgroup of personnel: white male high school graduates in their fourth year of service and within a year of the end of their first term of service. Figure 4 shows the DoD retention rates for this subgroup. The period from FY77 through FY82 depicts actual recent experience. The period from FY83 through FY90 displays forecast rates under the high and low pay scenarios. Historically, all of the retention rates fell from FY77 to FY79 and then

recruiter for every 300 male high school seniors. As a result, we do
not accept the usual assumption about population effects, and instead
have chosen to present forecasts based upon the smaller population
effect estimated in our enlistment model. On both pay and population
effects, however, we admit to some uncertainty about precise values.
The reader may wish to imagine 95 percent confidence bands extending
about 12 to 15 percentage points on both sides of each forecast line--
a little wider for the low-pay scenario--and widening over time.

The forecasts show the same general pattern as has been predicted
for some time, but the unexpected recruiting successes of the last few
years have shifted the scale upward. The projected declines are
considerable, but they should still leave DoD and especially the Army in
a much better position than they were in the late 1970s. It does not
appear, however, that even the high pay scenario can maintain current
high-quality enlistment levels. Still higher military pay--at least
another 10 percent--would be required to offset the effects of the
declining youth population and the recovering economy.

Will the projected supply meet the services' "needs" for high-
quality recruits? Total accession requirements depend on end strength
objectives and retention rates, but requirements for quality are not so
easily defined. Further, the measurement of "quality" is not the simple
task implied by our use of the standard high-quality definition: "high
school graduate above the 50th percentile." Thus, we cannot say whether
the projected decline in high-quality enlistments indicates trouble for
the services, or whether the improvement over what was expected a few
years ago means that the rest of this decade will be considered a
succession of good recruiting years. As will be seen below, however, a
focus on accession supply alone may give a misleading, overly
pessimistic picture of the AVF's future. Past, present, and future
retention rates, and their effects on the demand for new enlistees,
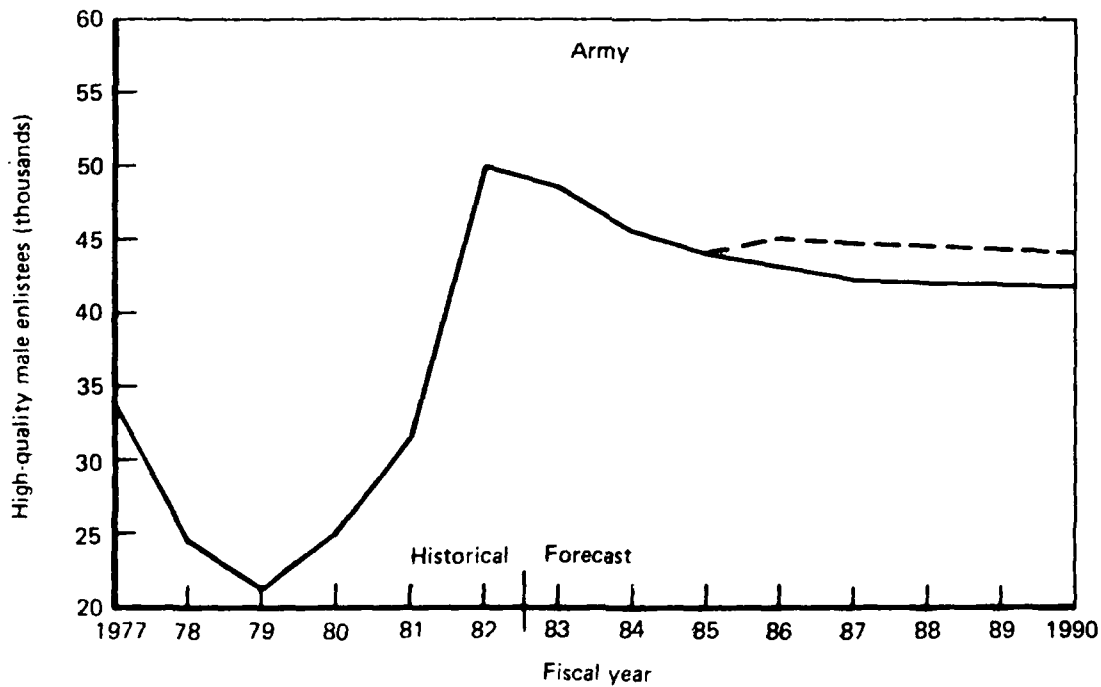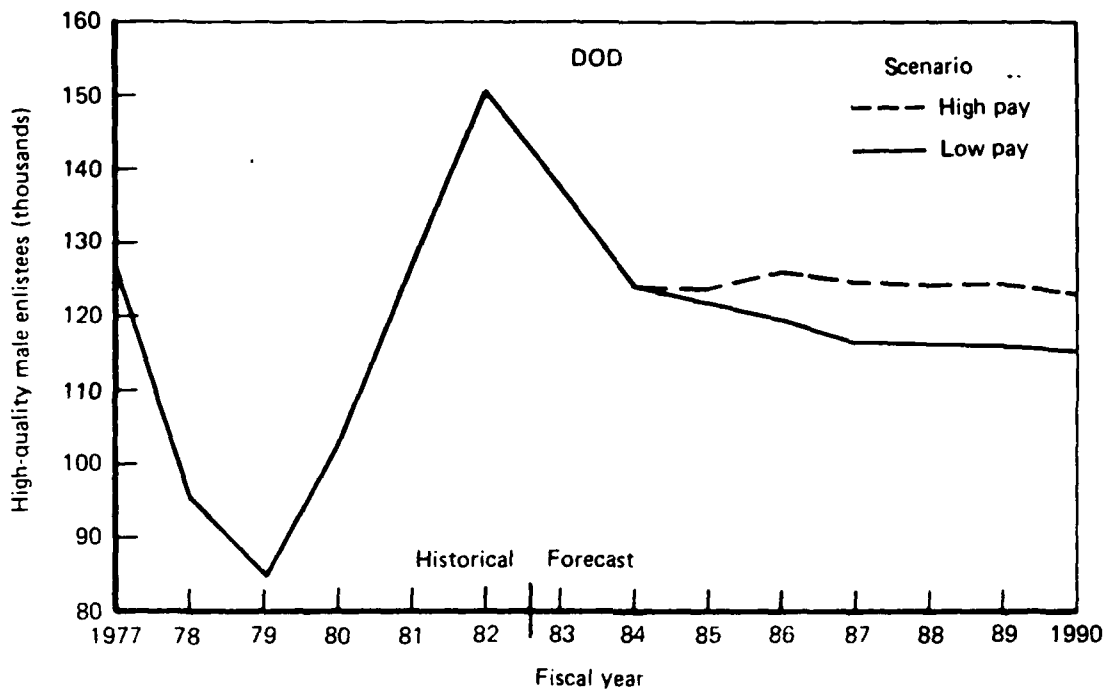deserve equal attention.

Fig. 3 — Actual and projected high-quality male enlistments (thousands),
DoD and Army

enlistment gains, indicating that the gain is not likely to be short lived.[7]

The principal assumptions behind the forecasts are that (1) no changes will be made in the number of recruiters fielded by each service and (2) no new major enlistment incentives will be introduced. Because the forecasting model does not estimate the effects of advertising, we implicitly assume no change in advertising expenditures or effectiveness. Further, the underlying taste of young men with respect to the military, whether determined by patriotism or by other factors, is presumed to remain unchanged.

Figure 3 shows the projected levels of high-quality male enlistments under the two pay scenarios, both for DoD and for the Army, as well as the actual levels since FY77.[8] The solid lines indicate enlistments under the low pay scenario (continued decline in relative pay); the dashed lines show the higher enlistment levels of the high pay scenario (the relative pay cuts of FY83 and FY84 are restored in FY86). Both sets of forecasts reflect the gradual erosion in relative pay (about 5 percent by 1990) that will result from the projected rise in the wages of young workers relative to the average civilian wage. Without this adjustment to the military/civilian pay ratio series shown in Table 1 (above), the enlistment forecasts would be about 3 percent higher.

In examining the forecasts, the reader should be aware that the forecasting model we have used shows smaller estimates of the effects of pay and population changes than do some other models. The commonly used estimate that pay changes cause equiproportionate changes in high-quality enlistments, for example, would push the lower forecast lines down by about four percentage points in FY88 and beyond, or about about 5,000 fewer high-quality male enlistments for DoD as a whole and 1,700 fewer for the Army. Similarly, it is generally thought that a one percent decline in the youth population would, other things equal, cause a one percent decline in high-quality enlistments. If this were true, it would move both of our forecast lines down by six to eight points in the later years. This common view, however, implies that recruiters have completely saturated the "market," when in fact even the Army, the service with the largest number of field recruiters, has only one

IV. SELECTED POLICY OPTIONS

For reasons we discuss in the concluding section, policy actions may be taken in the future to reduce the growth or alter the composition of the senior force. Therefore, even though our forecasts indicate the potential to meet tomorrow's end strength goals and accession requirements, it is valuable to consider policy options that can affect the quantity, quality, and skills of personnel recruited and retained. The options we consider include educational benefits, two-year enlistment terms, enlistment bonuses, recruiting resources, and reenlistment bonuses. These options can help insure that high quality individuals continue to enter the force. They also aid in channeling personnel into hard-to-fill occupations and in preventing shortages of trained personnel. Other options, such as changes in promotion rates or reenlistment eligibility criteria, also deserve attention. They, too, will surely be used to shape the force. We do not discuss them because at present considerably less is known about their quantitative effects on enlistments and retention.

POSTSERVICE EDUCATIONAL BENEFITS

The current basic program of postservice educational assistance in all four services is the Veterans Educational Assistance Program (VEAP). This program differs in two important respects from the GI Bill, which it replaced on 1 January 1977. First, VEAP requires the individual to make monthly contributions to his own benefit fund, which are later matched two-for-one by the government. Second, VEAP is less generous; the maximum government payment is $5,400, compared to the more than $13,000 available under the GI Bill to enlistees who entered the military before 1977. In the legislation establishing VEAP, however, the Congress authorized the Secretary of Defense to enhance the benefits offered to selected enlistees. This authority was exercised in the Multiple Option Recruiting Experiment of 1979, in which lump-sum enhancements of up to $6,000, called "kickers," were offered to high-quality enlistees entering specified "critical skills." However, the

results of this experiment with respect to the kickers were inconclusive.[18] The kickers were retained by the Army in FY80 and expanded in amount to a maximum of $12,000 as part of the FY81 Educational Assistance Test Program (EATP). In that larger amount they form the major incentive in the current Army College Fund. Kickers are not currently offered by the other services.

The best evidence on the effectiveness of educational benefits as enlistment incentives comes from the FY81 experiment.[19] Among its results, the EATP showed that the large kickers of the Army College Fund produced a 9 percent increase in Army high quality accessions.[20] The magnitude of this gain was confirmed when the Army College Fund was extended nationwide in FY82. A 9 percent response may not seem large, given estimates of up to 30 percent for the effect of ending the GI Bill,[21] but it must be remembered that the Army College Fund was being compared with a control program that already included smaller kickers.

The EATP results do not bear directly on the desirability of a more broadly-based program, such as the old GI Bill, or on whether the Army College Fund is a cost-effective means for maintaining or improving recruit quality. They do provide some guidance, however, on how the most cost-effective educational benefits program should be designed. First, it would retain the contribution requirement of VEAP. A noncontributory version of the basic program, tested in the EATP, did not raise enlistments appreciably. Although some observers claim that the contributory feature has made VEAP a failure by discouraging participation,[22] this feature appears to have done more to limit the cost of the program than to limit its effectiveness as an enlistment incentive. Second, the most generous benefits would be reserved for enlistees in selected hard-to-fill specialties. Such "skill targeting" further limits program costs, and ensures that most of the program dollars spent go to those enlistees with the greatest commitment to pursuing further education. Finally, to be most effective an educational assistance program should be narrowly targeted on those specialties, and services, where its effects are most needed. When the list of specialties eligible for the Army College Fund kickers was broadened midway through the EATP, many recruits were drawn away from the combat arms specialties that comprised the initial list. A second

test program, which equalized benefits across the four services, reduced Army enlistments.

Estimates of the annual steady-state costs of broad-based programs range as high as two billion dollars or more.[23] Consequently, the cost-limiting features described here may make the difference between a program that serves primarily as an aid to recruiting, and one that should perhaps be viewed as an extensive federal grant to the higher education of military veterans.

Another concern in the use of an educational benefit program as an enlistment incentive is it. possible adverse effect on retention. Because these benefits are used primarily *after* the individual leaves the military, the introduction of a more generous program may reduce retention rates at the end of the first term. This will likely be true not only for those servicemembers whose initial enlistments are directly attributable to the program, but also for others who, though they entered the military for other reasons, find the lure of a free or low-cost college education too great to resist. The latter phenomenon should be more pervasive in a broad-based program. At present, we have no way to estimate the adverse retention effects of VEAP educational benefits. Within the next few years such estimates will come from the retention decisions of enlistees who came in during the EATP period.

OTHER ENLISTMENT INCENTIVES

The two-year option. A two-year enlistment option was tested as part of the Multiple Option Recruiting Experiment of 1979. In general the option was limited to high-quality recruits, tied to certain specialties (primarily combat arms in the Army), and offered in conjunction with educational benefit kickers of $2,000.[24] It was hoped that the option might appeal to college-bound youths who, though discouraged from enlisting by the three- or four-year commitments usually required, would find a shorter break in their educations more appealing. Two separate analyses of the two-year option test, however, found no appreciable effect of the option on the number of high-quality male enlistments in the Army, the service with the most extensive test.[25] Smaller-scale Navy and Marine Corps tests showed larger effects when the option was open to enlistees in all specialties, but these

effects could not be estimated with any precision. Given the potential
that shorter enlistment tours have for drawing recruits away from the
standard tour lengths--a potential that seems to have been fully
realized in the Army--the two-year option does not appear to be a
valuable tool for improving force manning.[26]

Enlistment bonuses. Enlistment bonuses have been used primarily
as a tool for channeling quality recruits into hard-to-fill specialties
and for eliciting additional man-years of service in those specialties.
They require longer than normal enlistment tours and are limited to high
school graduate enlistees scoring above the 30th percentile on the AFQT.
The availability of enlistment bonuses has not, in general, been
advertised. This situation has been changed, however, in the Army's
Enlistment Bonus Test, begun in July 1982. For this test, Congress
authorized bonuses to high-quality enlistees in selected specialties who
choose the standard three-year tour. The test also includes higher
bonuses for a four-year tour. As the test results become available over
the course of the next year, we should learn whether skill-targeted
enlistment bonuses can, like the kickers in the Army College Fund, yield
an enlistment response that is larger than might be expected given the
limited number of specialties covered.

RECRUITING RESOURCES

"Recruiting resources" consist of recruiters, recruiters' aides,
advertising, and a variety of less-quantifiable factors such as funds
available to recruiters for transporting potential recruits to testing
centers and support given to recruiters to help them identify the most
likely candidates. Of these, the numbers of recruiters has received the
most study. The effects of advertising were studied in a 1980 Navy
experiment and are now under study in an experiment covering all four
services, but firm conclusions are not yet available.

Early studies indicated that adding one percent to the size of a
service's recruiting force would increase high-quality male enlistments
by perhaps one-half percent.[27] More recent estimates place the effect
in the 0.7 to 0.8 percent range.[28] Based on these higher estimates, the
projected 10 percent decline in high-quality male enlistments (high pay
scenario) could be offset by a 13 percent increase in the number of

recruiters DoD-wide--1,800 additional recruiters, with about 750 of those going to the Army. Estimating the cost of additional recruiters is difficult, but it is probably in the vicinity of $40,000 per recruiter per year. This would make the cost of the 1800 added recruiters in excess of $70 million annually. We caution, however, that the estimates of recruiter effects were based on data from the mid- to late 1970s; as the youth population declines, the contribution of an additional recruiter may fall.

The Army's recruiting successes of the last two years demonstrate that gains in high-quality enlistments may be achieved *without* corresponding increases in the resources devoted to recruiting.[29] The Army's improvement was obtained largely through a restructuring of its recruiter incentive system. The basic element of this restructuring was the introduction of the *mission box*. This gives each recruiter a specific quota for recruits, or "mission," broken out by AFQT category, high school graduate/nongraduate, and sex. Previously, each recruiter had been expected to achieve a total quota, but there were only informal pressures on him to concentrate on high school graduates or to avoid low-AFQT individuals. The mission box gave the Army Recruiting Command, for the first time, a mechanism for maximizing the proportion of its accession requirement taken from the most desirable categories, and the ability to do so even in the face of rapidly changing recruiting conditions.

Whether the other three services can make gains similar to the Army's remains to be seen. The Air Force probably stands to gain least from a switch to more detailed quotas because its enlistment standards already exclude most low-scoring and nongraduate applicants. The Navy also starts from a position of higher average quality in its recruits than did the Army, but it has begun to examine whether it could gain from the introduction of a system like the Army's mission box.

REENLISTMENT BONUSES

The Selective Reenlistment Bonus (SRB) program offers reenlistment bonuses in selected skills in order to reduce manning shortages in those skills. Analysis indicates that such bonuses can increase the retention rates. Because they target particular skills, reenlistment bonuses are

probably more cost effective for eliminating specific shortages than is an across-the-board increase in military pay. Reenlistment bonuses also offer greater flexibility, for they can readily be removed from a skill whereas a pay increase cannot be. Bonuses can help control transitory shortages, and the persistence of bonus payments in many skills indicates that they also play a role in alleviating long term imbalances due to such factors as persistently differing civilian pay levels or disamenities of particular military occupations. Reenlistment bonuses currently constitute under two percent of the military personnel appropriation (less than $1 billion of about $45 billion in FY83).

Although bonus coverage and (real) bonus amounts rose from 1977 to 1980, and the jump in bonus coverage among second-term reenlistees from 1980 to 1981 was a phenomenal leap from 22 percent to 40 percent, the prospects seem to be for reenlistment bonus usage to return to the levels experienced in the late 1970s. Nonetheless, should shortages in critical skills grow rapidly, DoD would presumably request additional SRB dollars.

In Table 4 we show estimates of the amount of increase in bonus amounts required to offset the effect of a one percent decline in relative pay (e.g., from 1.0 to 0.99) or a one percentage point drop in the unemployment rate (e.g., 9 percent to 8 percent).[30] The indicated increases would be enough to hold the retention rate constant in a typical bonus skill. Without going into the details of the SRB system, we note that the changes indicated by the table are well within the range of routine operation except for the largest amount shown, which is not far outside the usual range.

Aggressive use of the existing SRB system could blunt the effects of declining pay and unemployment on retention in critical skills. Moreover, because SRBs are payable only to personnel who sign on for three or more years, they tend to lengthen the average term of commitment. This in turn would increase the number of man-years of service, improve the military's return on its training investment, and reduce accession requirements.

Table 4

SRB BONUS INCREASES REQUIRED TO MAINTAIN
THE RETENTION RATE
(1983 DOLLARS)

Change	First-term	Second-term
One percent decrease in military/civilian pay ratio	$1,930	$2,010
One percentage point decrease in unemployment rate	$2,380	$6,970

V. CONCLUSIONS

Five years ago it appeared that the future of the All-Volunteer Force could be summarized easily: through the 1980s the numbers of young men and women reaching enlistment age would be declining, raising serious doubts that the services could meet their accession requirements for skilled personnel. These requirements are expected to grow as the process of force modernization continues. More recently, this pessimism has waned, but fears remain that the recruiting successes of the early 1980s would not have been achieved without a prolonged, deep national recession. Adding to this concern, new research indicates a faster-than-average rise in the wages of young workers--five percentage points by 1990--because of the falling numbers of such workers available to civilian employers.

As the AVF heads into its second decade, it is time to recognize that the traditional method of assessing its success has been too limiting. The picture of the AVF's future painted by a single line tracing high-quality supply leaves equally important parts of the canvas blank. Our work draws attention to major trends within the entire enlisted force. Absent any major policy changes, the current decade will see a shift toward a more senior force, requiring fewer and fewer new enlistees. The projected decline in the supply of high-quality accessions creates less alarm, then, when accession demand is also forecast to decline. As in the past, it will be important to monitor accession quality. But we believe it will be equally important to monitor the emerging trend in force structure. In addition, policymakers need to consider the costs and benefits of this trend. We raise such considerations below after presenting several caveats to our analysis.

We think the general picture presented by our forecasts is correct, but three qualifications should be borne in mind. First, our forecasts of high accession quality depend in part on estimates of the effects on enlistment supply of youth population changes, and of relative pay, that some may find implausibly low. Some researchers believe the "baby bust" will have more telling effects, and military pay erosion more serious

consequences, than our forecasts show. Thus, despite the reduced accession demand that the future force structure will generate, concerns about recruit quality may not disappear. Second, our forecasts of career force growth depend, to a certain extent, on assumptions about continuation rates for the individuals who have recently reenlisted in such large numbers. Individuals induced to stay for an additional term of service by generous reenlistment bonuses and especially high unemployment may reenlist at lower rates at the second and subsequent reenlistment points than we have predicted, at least over the next few years.[31] We should note, however, that our low pay scenario allows military compensation to decline to what is probably an unrealistically low level. Were pay somewhat higher, it would tend to offset the possibly optimistic retention projections.

Third, there are reasons to question whether the force-structure changes we predict will be allowed to happen. "A continuation of current policies" has meant, for the purposes of our forecasts, that mid-career servicemembers can expect the same opportunities for promotion to the senior enlisted grades as their predecessors. Grade table constraints, however, might force slower promotion or reduced promotion opportunities. Whether these changes would significantly reduce continuation rates we cannot say. In addition, the ASVAB misnorming of the late 1970s has focused new concern on the *quality* of recent reenlistees. Pressures may arise to force out some of those mid-careerists whose test scores, when they first entered the services, were inflated. Such a policy might be ill-advised--an individual's promotion history would seem to be a better measure of his "quality" at the reenlistment point than his initial test scores, and low scorers are promoted almost as rapidly as high scorers[32]--but it has been urged, and if instituted would obviously reduce continuation rates below those we forecast.

The future may not follow our forecasts exactly, but the general nature of the coming force structure evolution will very likely obtain if nothing major is done to change it. The movement toward a more senior force, however, raises some fundamental questions, among them: How is such a force to be managed? Is it sustainable? Is a more senior force desirable? If it is not desirable, what can be done to forestall it?

The principal management question arising from the evolving force structure is what is to be done with all these senior careerists. As noted above, current grade table limits seem likely both to slow promotion and to reduce promotion opportunities. Some relaxation of the present limits would therefore be necessary if morale (and perhaps retention) were not to suffer. Permitting an increase in the number of senior NCOs, however, would require a parallel change in the services' definitions of job responsibilities. Instead of the situation in the past where junior NCOs were filling the slots of E-6s and E-7s, in a more senior force many direct job-skill tasks would fall to individuals with 10, 15, or even 20 years of service.

A principal obstacle to the long-run sustainability of a more senior force is, paradoxically, the sharply reduced accession requirements that current tendencies are forcing. The "bow wave" moving into the senior career force was generated, in part, by the large accession demands of the last ten years. Lowered accession requirements in the 1980s may help to maintain recruit quality, but they will likely generate a trough moving into the senior force in the next decade that will pose new management problems and lead once again to higher requirements. Avoiding such a boom and bust cycle will require dampening the current wave--perhaps tightening reenlistment standards across the board--and ensuring that reenlistment rates for the coming smaller cohorts are not allowed to fall too low simply because end strengths can be met with smaller numbers of second- and third-termers. In addition, minimum accession levels could be maintained to ensure that flows into the mid-career years are sufficient to support the new force structure. This might require relaxing both end strength and budget constraints. Another option would be to plan for a policy of lateral entry in the nineties, if needed.

On the question of the desirability of the evolving personnel force structure we offer no judgements. Instead, we outline some of the considerations that should affect such judgements. First, the structure of personnel costs could change significantly. If end strengths are held constant, more money will be spent on basic pay, on retirement benefits, and on in-service benefits such as medical, subsistence,

schooling, and housing. Less will be spent on training and on supporting junior personnel through their largely unproductive first and second years. There may be more spent on retraining or cross-training senior personnel, however. Second, given constant end strengths the force should be much more productive and effective, particularly in areas where training and experience are more important than youth and vigor. This is, in effect, the benefit corresponding to the higher cost of the more senior force. Third, reduced flows through the first term may adversely affect Selected Reserve manning, and will raise concerns that the "citizen Army" concept is being lost. On both points, we note that although the absolute numbers of recruits flowing into the services each year will fall, the *percentages* of successive youth cohorts serving in the military will actually rise, even under our high pay scenario (which leads to lower accession requirements than the low pay scenario). In addition, the trend in Reserve accessions is now toward greater reliance on individuals without prior active service. Even so, the reserves can attempt to counter a decline in prior service recruits by offering larger enlistment incentives. Finally, adaptation to the more senior force will require active management initiatives, restructuring job tasks to conform to the availability of personnel at various experience levels.

If DoD policymakers believe action should be taken to modify the trend toward a more senior force, such action should be taken fairly soon. We have identified the presence of a relatively large stock of personnel with three to nine years of service. Many of these personnel will be making first or second reenlistment decisions in the next three years. It is at these reenlistment points, rather than later ones, that personnel management and compensation policies can be most readily tailored to trim the force and insure the retention of high quality personnel. Also, because personnel shortages and overages vary from skill to skill, as does the quality of personnel, such policy changes should probably be skill specific. Delaying actions to trim the force until the late 1980s will deny policymakers much of the leverage they could exercise today.

FOOTNOTES

1. Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics), *America's Volunteers: A Report on the All-Volunteer Armed Forces*, December 31, 1978, p. 183.

2. The extent of the ASVAB mis-scoring is shown in: Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics), *Aptitude Testing of Recruit.: A Report to the House Committee on Armed Services*, July 1980.

3. Our military/civilian pay variable employs the average hourly wage in manufacturing as the civilian wage series. This wage series does not always change from period to period by the same percentage as the Professional, Administrative, Technical, and Clerical (PATC) wage index, which is used as the basis for adjusting the pay of federal civilian employees and for gauging the extent of adjustment required in military pay. The PATC index, however, has been criticized as being unrepresentative of military jobs (an alternative, the Employee Cost Index, was recently proposed but not accepted as a replacement for PATC). The average wage in manufacturing seemed to us to be at least as appropriate a measure of civilian pay as the PATC index, and possibly more so. We were, after all, interested in a wage series reflecting civilian earnings opportunities in jobs that were similar to those in the military. For those who would have preferred PATC we note that the two series have moved fairly closely together, so that our forecasts would have been roughly the same had we used the PATC index instead.

4. We compute the size of this "catch-up" as the Congress probably would, comparing the 4 percent raises to the corresponding changes in the PATC index. This results in a larger raise than would be necessary, according to our civilian pay variable, to restore the pay ratio to its FY82 level.

5. Hong W. Tan and Michael P. Ward, *Forecasting the Wages of Young Men: The Effects of Cohort Size*, The Rand Corporation, R-3082-MRAL, forthcoming.

6. Robert F. Cotterman, *A Time Series of Cross Sections Model for Forecasting Enlistment Supply*, forthcoming. James R. Hosek and Christine E. Peterson, *Selective Reenlistment Bonuses and Retention Behavior*, forthcoming. David W. Grissmer and Corazon Francisco, *Forecasting Enlisted Force Trends*, forthcoming. This research was sponsored by the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics; now Manpower, Installations, and Logistics)--OASD(MIL). The forecasts do not necessarily reflect the position of OASD(MIL).

7. James Dertouzos, *Recruiter Incentives, Goals, and the Supply of High Quality Enlistments*, The Rand Corporation, forthcoming.

8. At the time the enlistment projections were produced, enlistment data for FY83 were not available. The projected levels for that year (shown in Fig. 3) have proved to be too low. More recent projections from the same model, reestimated to include FY83 data, show approximately the same levels of high-quality enlistments in FY84 and beyond as those appearing in the figure.

9. As used here, a retention rate is the percentage of individuals completing a given term of service who continue into a subsequent term. Those retained includes both reenlistees (additional commitment of two years or more) and extenders (additional commitment of less than two years).

10. In addition, the force structure forecasting model requires information on the retention behavior of women. For this we simply employ an average of recent female retention rates.

11. The small initial rise in the forecast retention rates may appear puzzling. It occurs because the underlying retention rate model allows for a lagged response to unemployment and the unemployment rate was rising in the early 1980s. This causes a positive effect on retention which dominates the negative effect from the declining relative wage.

12. Active duty enlisted strength stood at 1.78 million and Army strength at 0.674 milliion in 1982. Although current plans call for increased end strengths for the Navy and Air Force, Congress has recently deleted these active force increases and instead directed reserve force expansions. With current federal budget realities, constant force size seems a reasonable assumption, although the force structure model can easily accommodate alternate force size assumptions.

13. The assumed annual female accession level for FY83-90 is 41,000. This is approximately equal to the average level for FY80-82 and to current service planning submission estimates for FY84-89. The assumed education and AFQT distribution for these women is similar to that of FY77-82. For prior service accessions we use estimates made by the services in planning submissions. The average level of these over FY83-90 (24,000) is somewhat below recent experience (28,000 over FY77-82). We assume that prior service accessions will be distributed by years of service as they were in FY82.

14. The lower quality male enlistment groups in the model are assigned maximum values based on the highest enlistment levels achieved between FY76-82, and each is given a recruiting priority. The priorities are such that high school graduates are always enlisted before nongraduates, and that within equivalent education groups higher-AFQT enlistees are chosen before lower.

15. The quote that opens this paper sums up the DoD view of the future in 1978: major problems for the AVF in the 1980s as youth cohorts decline in size, possibly exacerbated by cyclical employment conditions.

A summary of the perceived strengths and weaknesses of the AVF, and a prediction of a return to the draft in the 1980's due to a failing AVF, appears in James L. Lacy, "The Case for Conscription," in *Military Service in the United States*, General Brent Scowcroft, editor, Prentice Hall, 1982. Arguing even more strongly for a return to a draft are Andrew J. Goodpaster, Lloyd H. Elliott, and J. Alan Hovey, Jr., *Toward a Consensus on Military Service: Report of the Atlantic Council's Working Group on Military Service*, Pergamon Press, New York, 1983.

16. By "demand" we specifically mean the level of accessions needed to achieve force strength goals, given projected retention behavior. In other contexts, demand might refer to manning requirements built up from assessments of the number and skill mix of personnel needed to man fully capable units. The accession requirements implied by the latter approach will not necessarily equal the accession demand we refer to.

17. Other factors probably contributed to the increase in first-term retention. Retention may have been held down in FY71-72, for example, by the Vietnam conflict, or by service attempts to reduce their force sizes during the withdrawal from Vietnam. The retention increase cannot be attributed, however, to the large military pay raise in November 1971. This raise affected only the most junior personnel.

18. See Gus W. Haggstrom, et al., *The Multiple Option Recruiting Experiment*, The Rand Corporation, R-2671-MRAL, November 1981.

19. In addition to experiments, researchers have attempted to analyze the effects on high quality accessions of dropping the GI Bill. Unfortunately, such analyses are hampered by the one-time nature of the change. Comparisons of pre- and post-G.I. Bill enlistment levels may confound the effects of the change with those of other forces operating at the same time. This problem was eliminated in the EATP. The test programs, of which the Army College Fund was one, were offered in limited areas of the country. In half of the country, potential enlistees were offered only the educational assistance program available nationwide during the preceding year--the "control" program.

20. Principal test findings and some results from a survey of military applicants during the test period appear in J. Michael Polich, Richard L. Fernandez, and Bruce R. Orvis, *Enlistment Effects of Military Educational Benefits*, The Rand Corporation, N-1793-MRAL, February 1982. Complete test results are given in Richard L. Fernandez, *Enlistment Effects and Policy Implications of the Educational Assistance Test Program*, The Rand Corporation, R-2935-MRAL, September 1982.

21. See, for example, the Army results in Lawrence Goldberg, *Enlisted Supply: Past, Present, and Future*, Center for Naval Analyses, CNS-1168, Alexandria, VA, September 1982.

22. See, for example, a statement by Congressman Duncan Hunter in U. S. House of Representatives, *New Educational Assistance Program for the Military to Assist Recruiting*, H. A. S. C. No. 97-45, U. S. Government

Printing Office, Washington, D. C., 1982, p. 364.

23. See Congressional Budget Office, *Improving Military Educational Benefits: Effects on Costs, Recruiting, and Retention*, Washington, D.C., March 1982.

24. For a complete discussion of the test format and results, see Haggstrom et al., op. cit.

25. A small-scale test of the two-year option was continued into 1980. This was the baseline comparison period for the FY81 EATP, so the analysis of that later experiment also yielded an estimate of the two-year option effect.

26. We are aware of alternatives to the AVF proposing mandatory national service, one option of which would be a short tour in the military. Discussion of such alternatives is beyond the scope of this paper.

27. See, for example, J. M. Huck and J. Allen, *Sustaining Volunteer Enlistments in the Decade Ahead: The Effect of Declining Population and Unemployment*, General Research Corporation, McLean, Virginia, September 1977.

28. See Goldberg, op. cit., and and Cotterman, op. cit.

29. The conclusions drawn here are based on the work reported in Dertouzos, op. cit.

30. The example draws from Hosek and Peterson, op. cit.

31. Warner and Simon found that roughly one-half of those induced to reenlist by bonuses leave at the next expiration of term of service (John T. Warner and Bruce D. Simon, *An Empirical Analysis of Pay and Navy Enlisted Retention in the AVF: Preliminary Results*, Center for Naval Analyses, Memorandum 79-1878, Alexandria, Virginia, December 1979). In unpublished simulations, Gotz and McCall estimated similar effects for officers. The retention model predicting these results is reported in Glenn A. Gotz and John J. McCall, *A Dynamic Retention Model for Air Force Officers*, The Rand Corporation, R-3028-AF, forthcoming.

32. A telling analysis of enlistee "quality" as indicated by the persistent tendency of some individuals to be promoted faster than others, almost regardless of their AFQT scores and, to a lesser extent, of their education, is presented in Michael P. Ward and Hong W. Tan, *The Retention of High Quality Personnel in the U. S. Armed Forces*, The Rand Corporation, forthcoming. Characteristics of the individual that do not appear in his personnel records, but that are presumably clear to his superiors, apparently carry more weight when his "quality" is evaluated within the military than do the traditional measures based on entry characteristics.

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