Analysis of the Post-9/11 GI Bill Benefits

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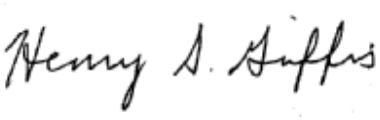

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Background and method

Passage of the Post-9/11 GI Bill in July 2008 increased the educational benefits for all servicemembers who had served more than 90 days on active duty since September 11, 2001. The previous educational benefit level was defined by the Montgomery GI Bill (MGI Bill). CNA was asked to study the impact of these increased benefits on retention and benefit use.

We investigated the retention and benefit use behavior of Sailors who had previously enlisted and received the Navy College Fund (NCF). The NCF also offered educational benefits that were significantly higher—roughly 50 percent higher—than what could be obtained through the MGIB. Although the Post-9/11 GI Bill offers benefits that vary by location, it is likely to offer increases that are roughly comparable in magnitude.

We focused on 1995-2001NCF accessions since these Sailors had completed their initial enlistments. We estimated models at the individual level of the probability that Sailors would reenlist, and the probability that they would use benefits if they left the Navy. These models enabled us to estimate the separate effects of specific Sailor characteristics, including whether they had received the NCF when they enlisted. In addition to historical data on Sailors who had received the NCF, we obtained a Department of Defense survey of over 9,000 enlisted and officers that provided information on their intentions to use the Post-9/11 GI Bill and the potential impact of an option to transfer the benefits to either their spouses or children in return for reenlisting.

Findings

We found that the NCF caused a statistically significant decrease in the retention of Sailors, but by a small amount—less than 1 percentage

point. While the Post-9/11 GI Bill could have a slightly larger effect due to benefit levels that were about 30 percent larger, its negative effect on retention is well within the range of variation that the Navy typically manages each year. Also, we found that the selective reenlistment bonus (SRB) has a strong and positive effect on reenlistment rates, and would be able to address any specific retention problems.

Our model showed that the NCF had a strong and positive effect on benefit use. Sailors who received the NCF were projected to start using their benefits at about a 13-percent higher rate than MGIB-eligible Sailors within 6 years of separation. We anticipate that the Post-9/11 GI Bill Sailors who do separate will have even higher benefit use rates.

The Defense Manpower Data Center survey provided insight into the potential effects of the Post-9/11 GI Bill and benefit transferability. The survey results, however, reflect only retention intentions, not actual retention behavior. The survey found a modest decrease in retention intentions for both officers and enlisted personnel associated with the new benefit levels: 3 percentage points for officers and 5 percentage points for enlisted. In contrast, two different questions on transferability found substantially larger positive effects on retention intentions—9 to 15 points for officers, and 14 to 24 points for enlisted. It is possible that the net effect of the Post-9/11 GI Bill will be to increase retention; however, this survey was conducted well in advance of when people will actually make their decisions, so it is difficult to assess how accurately the survey intention results will translate into behavior.

Implications and recommendations

A principal concern about the Post-9/11 GI Bill was its possible adverse effect on retention. In fact, benefit transferability was added to the legislation primarily to obviate the potential for adverse retention.

Our analysis of Navy retention indicates that the effects on retention will actually be minimal. We calculate that the aggregate effect from increased benefits was on the order of a 1-percentage-point reduction. Our analysis found that the decision of reenlisting and going to college can be modeled as if they are separate decisions. The Sailor's decision to reenlist is most strongly affected by marital status, occupation, paygrade, and especially SRB. Benefit use is affected by such factors as age,

Armed Forces Qualification Test, the NCF, and, to a lesser degree, marital status. Many of the important factors overlap, but it appears that Sailors make these decisions separately. This is reinforced by the observation that the decision to use benefits increased significantly with the time that the Sailor had been separated. Sailors make the decision on whether to stay in the Navy at one time. Many of the people who use benefits do not do so until after they have been out of the Navy for a year or more.

The adverse effect of educational benefits on retention is well within the range of variation that the Navy addresses annually with SRBs and other internal mechanisms. For example, we found that the annual variation in baseline retention rates produced by changing economic conditions has been on the order of nearly 5 percentage points, with annual changes of up to 10 percentage points not uncommon.

We found, based on the Navy data, that the transferability of benefits was largely unnecessary from a retention standpoint. Furthermore, transferability will be most attractive to those Sailors and officers who are married and have children. These groups currently have high retention rates. So, there is the potential for an increase in the retention differential between single and married Sailors.

The survey results of the impact of transferability on retention indicated that the attractiveness of transferability may end up increasing retention. If this is the case, SRBs may not need to be used as extensively in the future. However, our historical analysis of the NCF and the survey intention findings should be supported with analysis of current reenlistment decision behavior to quantify the net effects of the actual program.

We also note that the increased educational benefits will likely have a positive effect on recruiting that is not accounted for in today's resource accounting. The increase in benefits for the Post-9/11 GI Bill is over $27,000 above the MGIB. The DOD actuary currently would assess the Navy $4,391 for an educational benefit kicker of this amount. Thus, the Post-9/11 GI Bill has added an increase in money for college that would have cost the Navy over $170 million if it had used NCF kickers to acquire it. Given that educational benefits have been one of the principal attractants for Navy recruiting, the Post-9/11 GI Bill should contribute considerably to fulfilling the Navy's requirements for recruiting resources in the future.

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Background

In July 2008, the Post-9/11 GI Bill was passed by Congress and signed into law by the President. This legislation increased the benefits for all military personnel who had served 90 or more days on active duty since September 11, 2001. CNA was asked to investigate the impact that this benefit increase could have on retention and benefit use.

The Post-9/11 GI Bill offers a number of enhancements over the Montgomery GI Bill (MGIB). First, the Post-9/11 GI Bill does not require any contributions to participate. The MGIB required pre-tax contributions of $100 per month from each enrollee. Second, all officers and enlisted personnel are eligible for the Post-9/11 GI Bill. Officers who entered from one of the military academies or ROTC were not eligible to participate in the MGIB.

The most significant changes in the Post-9/11 GI Bill come from the way it provides benefits. The MGIB provided a maximum monthly payout for up to 36 months of benefits. Benefit levels were periodically adjusted, but a Sailor leaving the service would receive a level of benefits that would be fixed, based on when he or she separated.

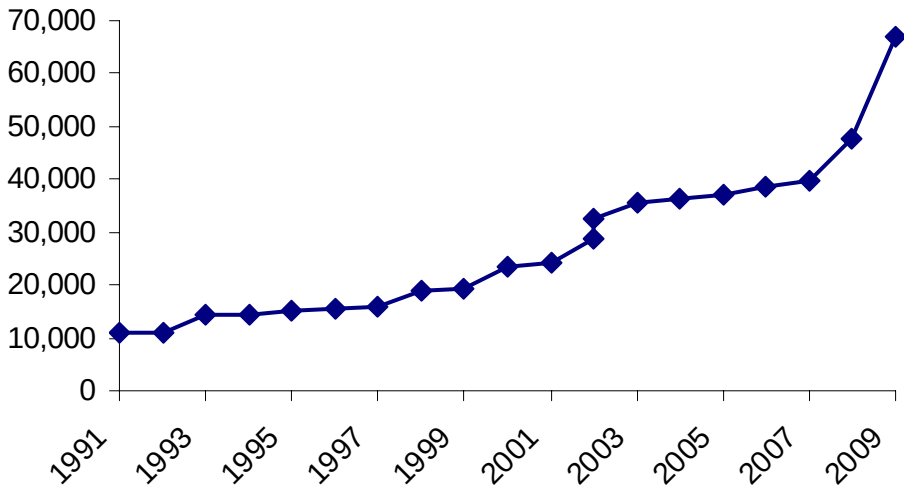
In contrast, the Post-9/11 GI Bill offers benefits that vary depending on the cost of attending school. The three principal financial benefits are full tuition, a monthly stipend, and money for books and supplies. The Post-9/11 GI Bill will pay up to the maximum tuition charged by a public university in each state, as well as fees. Each full-time student will also receive a monthly housing stipend, based on the E5 married rate for their location. For example, in 2009 a student at Pennsylvania State University (PSU) would receive a stipend of $1,106 per month. Also, a student will receive up to $1,000 annually for books and supplies, including computer equipment.

Unlike the MGIB, whose benefits were established at the time of separation, the Post-9/11 GI Bill benefits can vary considerably, depending on the tuition and E5 housing allowance in different locations.

The benefits for attending a top public university, such as PSU, could reach $100,000 or more for tuition, fees, monthly stipend, and supplies. The College Board [1] found that, in 2008–2009, the average annual tuition and fees were $6,585 to attend a public 4-year college and $2,402 for a 2-year school. We estimate that the average current benefits that would be awarded over 4 years would be about $67,000.

Figure 1 shows the benefit levels awarded under the MGIB for 1991 through 2009, including those projected for the Post-9/11 GI Bill in 2009. We converted amounts to their 2008 purchasing power based on an education cost deflation factor. Adjustments to the MGIB have periodically raised benefits, particularly in 2000 and 2002–2003. The Post-9/11 GI Bill will constitute an even larger increase in education purchasing power than any increases that have occurred since 1991. Post-9/11 GI Bill benefits will increase by over 50 percent from the levels expected when today's Sailors enlisted.

Figure 1. GI Bill benefits (1991–2009) in real dollars



In addition to increasing the benefits for college attendance, and offering benefits to all officers, the Post-9/11 GI Bill permits certain personnel to transfer their benefits to either a spouse or child. Military personnel who have at least 6 years of service who commit to at least an additional 4 years can transfer their benefits. The intention of offering transferability is to encourage people to remain on active duty, rather than leave to use the benefits themselves.

Approach

We addressed the following policy questions in our analysis of the Post-9/11 GI Bill:

- What impact will the Post-9/11 GI Bill have on Sailor retention?
- How will the Post-9/11 GI Bill affect benefit use?
- What will be the impact of increased benefits on a critical field, such as nuclear power?
- What can survey results tell us about the intentions of officers and enlisted personnel to use benefits?
- What can surveys tell about the potential impact of transferability?

We address the first three questions with the analysis of historical data from the retention and benefit use data from previous educational benefit programs, notably the Navy College Fund (NCF). In addition to analyzing the overall impact on Sailors, we examine in detail specific occupations of interest to Navy planners, paying particular attention to the nuclear power field. The other two topics we address through our analysis of a survey of Department of Defense (DoD) personnel conducted by the Defense Manpower Data Center (DMDC) in August 2008 [2]. This survey asked over 9,000 officers and enlisted personnel about their retention plans, as well as how their behavior might be affected by educational benefit programs.

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Previous analyses of the impacts of educational benefits on Sailor retention and benefit use

The Post-9/11 GI Bill that was passed in 2008 has been a retention concern for the Navy. Such a program would likely increase future enlistments. However, the Post-9/11 GI Bill applies retroactively to virtually all Sailors currently serving in the Navy. Unlike previous educational benefit expansions, such as the NCF, which increased enlistments before producing any retention impact, the Post-9/11 GI Bill can expect to produce an immediate impact on retention.

The incentive to leave the Navy and use benefits could be potentially large. One study estimated that, to counteract educational incentives to leave the service, selective reenlistment bonuses (SRBs) would need to be increased by as much as $300 million a year [3].

One substantial study of the possible effects of the Post-9/11 GI Bill has been performed thus far. Warner [4] investigated the effects of education benefits on both retention and benefit use for recruits who entered the services from 1988 through 2001. He examined both the educational benefits available to a recruit upon entry, as well as the benefits available when the person reached his or her reenlistment decision point, since benefits were frequently raised by Congress while the person was in the military. By decomposing the effect of benefits into both an enlistment level, which would be known to the recruit, and a portion that changed during his or her service, he could analyze whether unexpected benefit increases resulted in different behavior. The shock of unexpected benefit changes during service is particularly useful in identifying the impact of the Post-9/11 GI Bill because the benefit change could not have been anticipated.

Warner found that increased educational benefits were usually associated with negative retention effects and increased benefit use. Although he found this effect for other services, he did not find any

consistent impact for Navy Sailors. Warner's analysis, however, did not include a measure of the SRB, nor was he able to control for service-specific occupational effects. These two factors are important both for understanding the impact of educational benefits and for assessing the costs of responding to retention effects.

The Navy uses the SRB to increase reenlistment in ratings and Navy Enlisted Classifications (NECs) that are undermanned. The SRB is set by rating and years of service. Sailors with 17 months to 6 years of service are in zone A, those with 6 to 10 years of service are in zone B, and those with 10 to 14 years of service are in zone C. For example, a Sailor in the nuclear field, with the NEC Code of 3353 (submarine nuclear power plant operator-reactor control) who has between 6 and 10 years of service at the time of reenlistment would be entitled to a reenlistment bonus multiplier of 7.5.

The amount of the SRB is determined by the bonus multiplier, monthly base pay, and number of years reenlisting for. For example:

SRB = (BONUS MULTIPLIER) X (MONTHLY BASE PAY)
X (NUMBER OF YEARS REENLISTING FOR) .

In the above case, the Sailor in the nuclear field who reenlists for 6 years would receive a bonus of 7.5*6 years*the monthly base pay. Currently, the maximum zone B bonus permitted by the Navy is $75,000.

The Navy varies the SRB frequently—both across jobs and over time. Past research [5] has found that the SRB multiplier has had a strong effect on retention rates, ranging from 0.4 up to 5.5 percentage points in different studies.

These are important factors for program managers. SRBs can be targeted against particular skills, and modified relatively quickly to reflect changing conditions. Maintaining high retention is especially important for Sailors serving in positions with expensive or long training programs, such as the nuclear power field. SRBs are the principal policy lever available for increasing retention. A model that explicitly contains this tradeoff among its factors will be able to directly extrapolate the amount of SRB required to counteract education benefit increases in specific jobs.

Modeling retention and benefit use

To understand the effects of educational benefits, we examined historical changes in educational benefits that were available to Sailors and followed them through the retention point and into the post-service timeframe. Sailors have had two sources of educational benefits available to them: the Montgomery GI Bill (MGIB) and the Navy College Fund (NCF). The MGIB is available to all Sailors, provided they do not explicitly decline coverage during the beginning of their enlistment. The NCF provides additional educational benefits that are offered to Sailors who select it as an enlistment option. The Sailor must also enroll for the MGIB in order to receive the additional benefits (known as kickers) from enrolling in the NCF. Initially, NCF was used as a "deal closer" and was offered to a limited number of high-quality recruits to induce them to enlist [6].

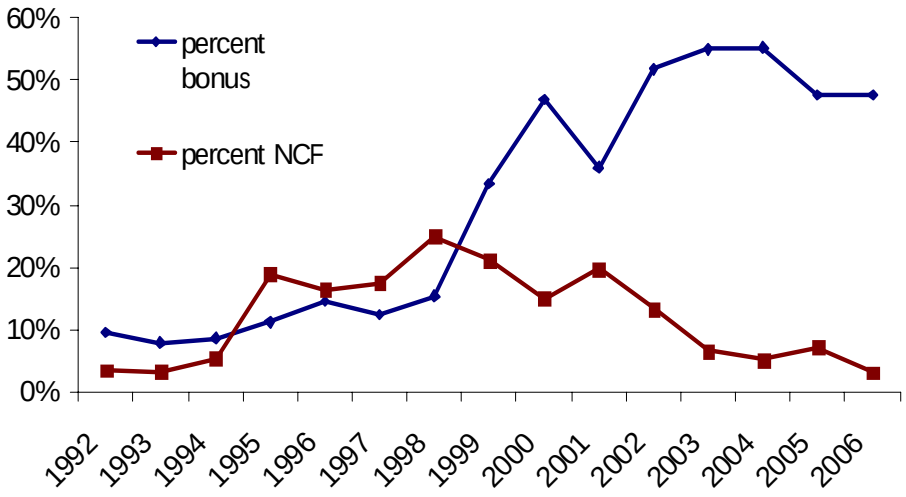
In FY 1995, the Navy expanded the NCF and offered it to all high-quality recruits who enlisted in specific ratings or programs, resulting in over a fivefold increase in NCF enlistments. The purpose of the expanded NCF was to increase the supply of high-quality recruits by advertising educational benefits as an enlistment incentive [6]. A Sailor was required to enlist in ratings and programs where the Navy experienced shortages. The number of jobs offering NCF benefits increased, including general detail positions and 3-year enlistments.

During FY 1995, the NCF offered $25,000 in educational benefits, compared with $14,400 offered through the GI Bill. The NCF kicker is fixed at the enlistment point, so the actual value of the benefits will decrease due to education inflation by the time the Sailor begins using the benefits.

Figure 2 shows the percentage of Sailors enlisting who received either the NCF or an enlistment bonus (EB). (Until the end of FY 1999, a Sailor had to select either the NCF or an enlistment bonus. Beginning in FY 2000, recruits in the nuclear filed were offered a combination

of a reduced bonus with the NCF kicker.) From FY 1995 to FY 1998, the NCF was used more extensively than the enlistment bonus.

Figure 2. Enlistment incentive use: 1992-2006



We used the NCF as a measure of the impact of educational benefits on retention and benefit use. First, the NCF represented a substantial increase in benefits over the basic GI Bill. In FY 1995, an NCF recipient received 74-percent larger benefits than a GI Bill recipient. The relative difference in benefits between the MGIB offered to all recruits and the NCF provided a treatment effect for evaluating the impact of providing increased educational benefits to Sailors.

Second, large numbers of Sailors who were offered either the MGIB or the NCF since FY 1995 have completed their initial enlistment and can be followed for several post-service years. This history enables us to compare their retention and benefit use behavior with similar Sailors who did not select the NCF at enlistment.

However, the effects of the NCF, while comparable to the Post-9/11 GI Bill, are not necessarily identical. NCF recipients explicitly selected educational benefits as an enlistment incentive, while the recent GI Bill increase was unexpected. Therefore, NCF recipients could show decreased retention effects, while Post-9/11 GI Bill

recipients may not. So, we believe that any adverse retention effect found for the NCF could be considered an upper bound for the likely effect of the Post-9/11 GI Bill increases.

We estimated equations for the probabilities of retention and benefit use for Sailors:

$Ri = f(NCF, EB, SRB, X_i)$

$BUi = f(NCF, EB, X_i)$,

where *R* is the probability that a Sailor (indicated by subscript *i)* will remain in the Navy past his or her enlistment point, and *BU* is the probability that a Sailor will have begun to use educational benefits after separating from the Navy. *NCF* is a categorical variable that is 1 if the Sailor selected. Other variables in the equations included enlistment bonus as a dichotomous variable, and the selective reenlistment bonus *(SRB)* multiplier, which ranged from 0 to 11.5. A large number of other factors are included in *X*, such as individual characteristics, rating, and fiscal year cohort. The specific components of the set of factors in *X* will be discussed in more detail later.

The most direct and simplest approach is to estimate separate equations of retention, then of benefit use for those who separate. This approach assumes that each decision is made independent of the other. That is, those who decide to remain in the service would behave the same as those who separate, and would react to an increase in educational benefits the same way as those with similar characteristics who have chosen to separate.

Previous econometric modeling, such as that of Heckman [7], has found that this assumption may be prone to bias. We only observe the benefit use of those who chose to separate. It is possible that those choosing to leave are self-selected based on their expectation of higher benefits from attending college, and those choosing to remain in the service are similarly self-selecting to remain in the Navy.

Warner [4] estimated the impact of educational benefit use using both a simple probit model and a two-stage model that corrected for selection bias in benefit use. He found that the two-stage model was

significantly different from the single stage for the Navy, and that the simple probit provided an estimate of entry benefits that was 17 percent higher than the two-stage model.

We used both approaches in our estimation of the effects of educational benefits. First, we estimated separate equations for retention and benefit use using a logistic regression model. Then we used the two-stage Heckman model that uses the retention results in estimating the effects of increasing educational benefits on benefit use. The Heckman model also provides an explicit test of self-selection bias. The use of the two-stage estimates would affect the modeling of benefit use effects. If there is a significant self-selection bias, we would use the results from the retention model in the projection of expected benefit use.

Development of the data for modeling

We constructed a data set of recruits who entered the Navy in FY 1995 through FY 2001. This period included many Sailors who selected the NCF, as well as considerable variability in terms of enlistment ratings and cohorts. These sources of variation over 7 years of enlistments provide a data set that should be able to identify significant differences in retention and benefit use behavior for NCF recipients.

We were able to obtain the Navy portion of the enlistment data that Warner had used in his analysis of enlisted retention and benefit use. We merged Warner's data set with Navy data on additional factors, including the person's rating and the SRB multiplier offered at the retention decision point. These additional factors enabled us to produce rating-specific estimates of retention rates, as well as the impact of the SRB on retention.

Appendix A provides the mean values for the variables in the combined data set for three populations of interest:

- All Sailors reaching the retention decision point
- Sailors remaining on active duty
- Sailors separating at the retention decision point.

Fifty percent of the Sailors who reached the reenlistment point reenlisted, and 51 percent of those who separated had begun using educational benefits by June 2005. Twenty-three percent of the Sailors who reached the reenlistment point had NCF benefits, and 24 percent of those not reenlisting had selected NCF benefits at enlistment; 27 percent of those who had used benefits were NCF recipients.

We created two data sets for analysis. For estimation of the two-stage model, we used Sailors who accessed from FY 1995 through FY 2001. These years provided a large sample of people who made their retention decision over periods of both increasing and declining unemployment, and included large numbers of people who had received the Navy College Fund (NCF) as an enlistment incentive.

Since the original data set contained benefit use data only through June 2005, we only included Sailors who had made their reenlistment decision before December 2004. This permitted everyone at least 6 months to begin using benefits. This data set included 125,557 observations.

Because we had the data on retention behavior for Navy personnel through FY 2008, we were able to estimate a second retention model over a larger period of time. This data set included 151,843 observations of Sailors who had made their first retention decision.

Our data set included over 150 explanatory variables, which we grouped into the following categories:

- Economic incentives
- Sailor characteristics
- Enlistment characteristics
- Environmental factors.

Economic incentives include the key policy variables of greatest interest in this study: the NCF and the SRB. We included whether the Sailor received an enlistment bonus since this factor could also be associated with later retention behavior. On one hand, it may be that Sailors self-select at the enlistment point with those most likely to leave the service selecting the NCF, while those most interested in a

career in the Navy choose the bonus. On the other hand, both groups could be associated with lower retention since they selected economic inducements to enlist.

Retention estimation results

The data set used for our analysis contained 151,843 Sailors who accessed between 1995 and 2001. Appendix B provides results from the estimation of the separation model from this sample. The dependent variable was the probability of remaining in the Navy after the first reenlistment point. Fifty percent of the Sailors separated at this point. Positive coefficients are associated with increased retention (and decreasing separation rates.)

Appendix B provides the results from the estimation of the reenlistment model. The dependent variable was the probability that a Sailor remained in the Navy past the first reenlistment decision point. The explanatory variables include whether the Sailor had selected the NCF as an enlistment option, as well as a number of other factors hypothesized to affect reenlistment behavior. The model was estimated using a logistic regression on individual observations. Positive coefficients are associated with increased reenlistment probabilities.

The factors that we focused on in the retention model include:

- Navy College Fund (1 if selected at enlistment, 0 otherwise)
- Enlistment bonus (EB) (1 if selected at enlistment, 0 otherwise)
- SRB multiplier (ranging from 0 to 11.5).
- Initial enlistment obligation (categorical variables for years of service ranging from 2 to 6)
- Age
- Female (1 if female, 0 if male)
- Race/ethnicity (categorical variables for black, Hispanic, Asian/Pacific Islander, native American, and other)
- Married (1 if married at enlistment, 0 otherwise)

- Children (number of children at enlistment)
- Married at the reenlistment decision point (1 if married, 0 otherwise)
- Children at reenlistment (number of children at the reenlistment decision point)
- Education (categorical variables for high school degree, GED or nongraduate, some college, bachelor's degree, and other)
- Armed Forces Qualification Test (AFQT) score
- Median family income (measured at the state level during the year of enlistment)
- College attendance (the percentage of high school graduates, age 17-21, enrolled in college, measured at the state level during the year of enlistment)
- Veteran population (percentage of male population age 35 and above that had military service, measured at the state level)
- Paygrade at decision point
- Year of reenlistment decision
- Rating.

NCF was significant at the 99-percent confidence level and was associated with lower retention. Both EB and SRB were associated with significantly higher retention rates. Initial enlistment term also was a useful retention indicator, with 3-year obligors associated with lower retention (i.e., lower than 4-year obligors), and 5- and 6-year obligors associated with higher retention rates.

Demographics also played important roles in the retention model. Younger Sailors were significantly more likely to reenlist, as were blacks, Asian / Pacific Islanders, native Americans, and Hispanics. The retention rates for men and women were not significantly different.

Marriage and children were also significantly related to retention. We included two types of measures: marital status at enlistment and at the retention decision point, as well as having one or more dependents

at both enlistment and the decision point. Being married or having a dependent was associated with higher retention, both at the enlistment point and at the retention decision. In both cases, the retention effects were larger when measured at the retention decision point, but those people who entered service married or with dependents, and were still married and/or with dependents at the retention decision point, had the highest retention rates.

Higher AFQT scores were associated with lower retention rates. Sailors who had a college degree were less likely to stay in the Navy, while GED recipients were more likely to remain than high school graduates.

Paygrade was an important variable in explaining retention rates. Sailors who had not attained E4 were very likely to not remain in the Navy past their retention decision point, whereas those who had achieved E5 were more likely to remain.

Rating was also an important factor in retention behavior. All other things equal, Sailors enlisting as yeoman (YN), musician (MU), and cryptologic technician (CTA) would have some of the highest retention rates. Conversely, such ratings as aviation ordnanceman (AO), electronics technician (ET), fire controlman (FC), and nuclear field (NF) would have some of the lowest retention rates.

Decision year also provided significant explanatory power in the estimation of retention rates. Since we did not include economic indicators in the model, fiscal year factors could be a surrogate for economic conditions. FY 1999 was our reference year. Every other year had significantly higher retention than 1999 during 1995 through 2005 when our cohorts reached the retention point. FY 2003 had the highest retention rate during this period.

Also available to us were three other socioeconomic factors that had proven useful in enlistment models. Each socioeconomic variable is drawn from the Sailor's area of residence at the time of enlistment.

- Family income
- College attendance

- Veteran population.

All three factors were associated with decreasing retention rates. This could be expected for college attendance and income, but it was surprising that Sailors enlisting from areas that had higher percentages of veteran population experienced lower retention rates.

Benefit use estimation results

We estimated benefit use probabilities using two models:

- Two-stage model of the separation and benefit use equation
- Separate single equation of benefit use probability.

The two benefit use equations produced nearly identical results. All the variables (other than enlistment rating) that were significant in the two-stage model remained significant in the single benefit use equation, with the exception of EB. EB went from being significant at the 5-percent level to only the 10-percent level.

The factor lambda, the inverse Mills ratio, is not significantly different from zero. This is equivalent to a test of the independence of the two equations, indicating that there is not significant sample selection bias. Since the separate equation models and the self-selection results are statistically equivalent, we used the separate equation models in our projections.

We examined the effect of NCF and other factors on the probability that a Sailor who had separated from the service would use benefits. While most of the factors used in the model are the same ones that are in the retention model, there are several differences:

- Two variables measure the time since the Sailor had separated (months out and months out squared).
- SRB was dropped from the benefits use model.

Sailors differ substantially in the amount of time they have been separated from the Navy. Previous analyses of educational benefits had found that many individuals begin using the benefits shortly after separating from the service [8]. One technique to control for different

lengths of time to use benefits is to establish a cutoff point to control for time since separation [4]. This approach, however, would eliminate many Sailors from the most recent cohorts. We chose to include a specific measure of time since the Sailor separated. By including both a month and a month-squared variable in the model, we can determine how quickly Sailors typically begin benefit use and can make projections of benefit use over time.

While SRB played an extremely important part in the retention decision, we excluded it from the benefit use equation. Once a Sailor has left the Navy, it should not affect whether he or she chooses to attend college. The effects of SRB and rating on reenlistment are two reasons why we did not find any significant self-selection effects in our two-stage estimation. Warner did not have SRB data in his specification, and he had only aggregate broad occupational categories. SRB not only plays an important role in identifying separate reenlistment and benefit use effects; SRB was the single most important factor in the reenlistment model, with an effect over 68 times the standard error estimate. Omitting SRB from the reenlistment equation would likely introduce bias in other coefficients.

We estimated the benefit use model from the single equation from Sailors who had separated by September 2004. We had 62,055 observations in this model. The key variables in the estimation of the probability of benefit use included:

- Navy College Fund
- Enlistment bonus
- Months since separation
- Months since separation squared
- Initial enlistment obligation
- Age
- Female (1 if female, 0 if male)
- Race/ethnicity (categorical variables for black, Hispanic, Asian/Pacific Islander, native American, and other)
- Married (1 if married at enlistment, 0 otherwise)

- Children (number of children at enlistment)
- Married at the reenlistment decision point(1 if married, 0 otherwise)
- Children at the reenlistment decision point (number of children)
- Education (categorical variables for high school degree, GED or nongraduate, some college, bachelor's degree, and other)
- Armed Forces Qualification Test (AFQT) score
- Median family income
- College attendance rate
- Veteran population
- Paygrade at decision point
- Year of reenlistment decision
- Rating.

The NCF was related to increased probability of using benefits, with a coefficient more than 16 times its standard error. Both months and months squared were strongly related to the probability of benefit use, with months being positive and the months squared coefficient negative. This indicated that the probability of beginning benefit use increased rapidly when the Sailor first separated but declined over time.

Enlistment bonus remained in the model as a potential indicator of self-selection effects for benefit use. Those recruits who initially opted for bonuses could be Sailors who thought that they would be less likely to use benefits. If fact, we found that bonus recipients were somewhat more likely to use benefits. Similarly, we expected Sailors with shorter enlistments would be more likely to use benefits, and those with longer enlistments would be less likely. We found this to be true for those Sailors with the longest enlistment (6-year initial obligation) and the shortest enlistment (2-year obligation).

Sailor characteristics, such as age, gender, and race/ethnicity, were found to be significant factors in benefit use. Women were far more likely than men to use benefits . In fact, a woman would be more likely to use benefits than a man who had received the NCF. Blacks, Hispanics, and Asian/Pacific Islanders were all significantly more likely to use benefits as well. Age was also strongly related to benefit use, with younger Sailors much more likely to use benefits.

Family characteristics were also significant factors in beginning benefit use. Those Sailors married and/or with children were much less likely to use benefits.

Education and AFQT are related to benefit use. AFQT has one of the strongest relationships to benefit use. An AFQT difference of about 30 points is equivalent to the effect of having the NCF available to a Sailor. Education was a more complex series of effects. Those with either a college degree or only a GED were least likely to use benefits, while those with some college were most likely to begin benefit use.

We tested whether paygrade was related to benefit use. We found that Sailors who separated below E4 were least likely to use benefits, while those who had achieved E5 were more likely to use benefits. Those who had achieved E6, however, were not more likely to use benefits.

Decision year was also a significant factor in benefit use, although its effects will be intermixed with months since separation. FY 1998 had the highest year of benefit use, while FY 2001 was the lowest for those cohorts that had been observed for at least 2 years.

Enlistment rating was an important factor in explaining differences in benefit use. Although less significant than retention effects, there were significant differences across ratings, perhaps indicating possible relationships between military skills acquired and their transferability to the civilian workplace. The ratings with the highest benefit use included administrative jobs—religious program specialist (RP), administration (ADMN), and personnelman (PN), as well as aerographer's mate (AG). Ratings with the lowest use of benefits included construction ratings, such as builder (BU), construction engineer (CE), construction mechanic (CM), equipment operator (EO), and utilitiesman (UT), as well as air traffic controller (AC).

We also evaluated the effects of the socioeconomic indicators on benefit use. Each socioeconomic variable is drawn from the Sailor's area of residence at the time of enlistment. The percentage attending college was positively related to benefit use, while veteran population was negatively related. Family income was not significantly related to benefit use.

Projecting the effects on retention and benefit use

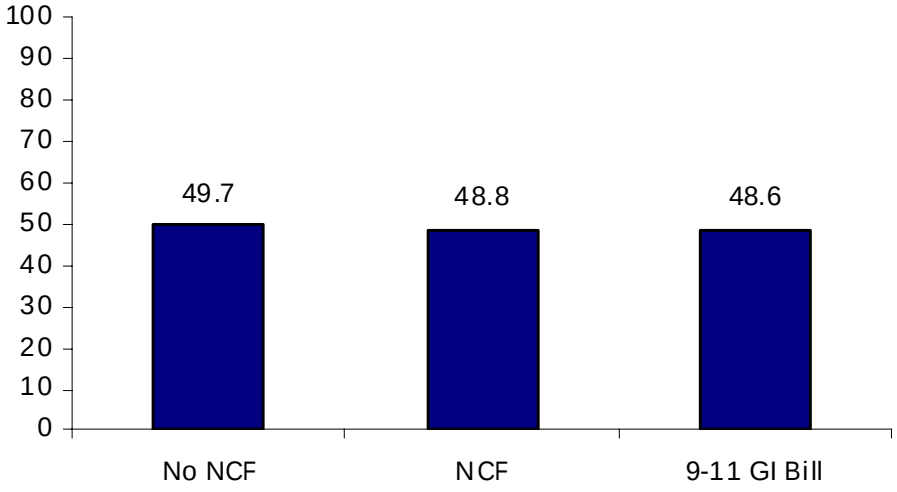
We used the logistic models of retention and benefit use probabilities to estimate how much changing specific factors could affect rates. We applied the regression model to the individuals in the cohort, while varying the values of selected parameters of interest. We focused on the following types of effects:

- Educational benefits
- Economic incentives
- Marriage and dependent status
- Ratings
- Cohorts.

NCF participation was used to identify the effects of education incentives on retention. The NCF was used as a major enlistment incentive during this period, offering benefits of $25,000 or more for college from 1995 to 2001. For comparison, we estimate that the expected benefits of the Post-9/11 GI Bill currently are about $67,000. When we converted both of these amounts into 1995 dollars based on changes in college tuition and fees, we find that the Post-9/11 GI Bill is worth approximately 30 percent more than the median NCF benefit. Thus, we multiplied the effect of the NCF by a factor of 1.3 to estimate the impact of the Post-9/11 GI Bill.

Figure 3 shows the estimates of retention rates for Sailors without the NCF, with the NCF, and with the Post-9/11 GI Bill. While the effect of the NCF was statistically significant, it would be expected to lower the retention rate by about 2 percent, or slightly under 1 percentage point. The Post-9/11 GI Bill would have a somewhat larger effect, but only slightly more than 1 percentage point.

Figure 3. Retention effects of NCF and Post-9/11 GI Bill



We believe that the NCF impact is likely to overstate the effect of the Post-9/11 GI Bill. Sailors who received the NCF in our sample explicitly selected the NCF as an enlistment incentive. Recruits either had to choose the NCF over an enlistment bonus or receive a much smaller EB. Current Sailors receiving the Post-9/11 GI Bill benefits would not have had to make any conscious decision on their preference for educational benefits.

Economic incentives would be expected to have a much greater impact. Figure 4 illustrates the key effects we found for SRB and EB. Increasing the SRB multiplier by 1 to a rating would increase retention by nearly 17 percent, or 8 percentage points. We found that awarding an enlistment bonus also had a surprisingly large effect on retention, with those enlisting with a bonus being retained at a 13-percent higher rate than those without a bonus.

The positive retention effect of an enlistment bonus on retention is somewhat surprising. Previous research [9] had found that Army recruits who had received bonuses in the 1980s had reenlistment rates 3 percentage points lower. However, more recent research on Army retention [10] found that bonus recipients were more likely to reenlist than other similar recruits. It may be that more recent cohorts are behaving differently from past cohorts. Or, it may be that the enlistment bonus is being used to achieve a number of policy

objectives, and is moving motivated recruits into occupations and time periods in which the Navy requires an increase in supply. Bonuses during this period were used to modify Delayed Entry Program times, reward recruits with college credits, and take longer enlistment terms, as well as choose occupations. There is little evidence that they increased the enlistments of marginally motivated recruits; they were used to redistribute people who had already decided to enlist.

Figure 4. Retention effects of enlistment bonus and SRB multiplier

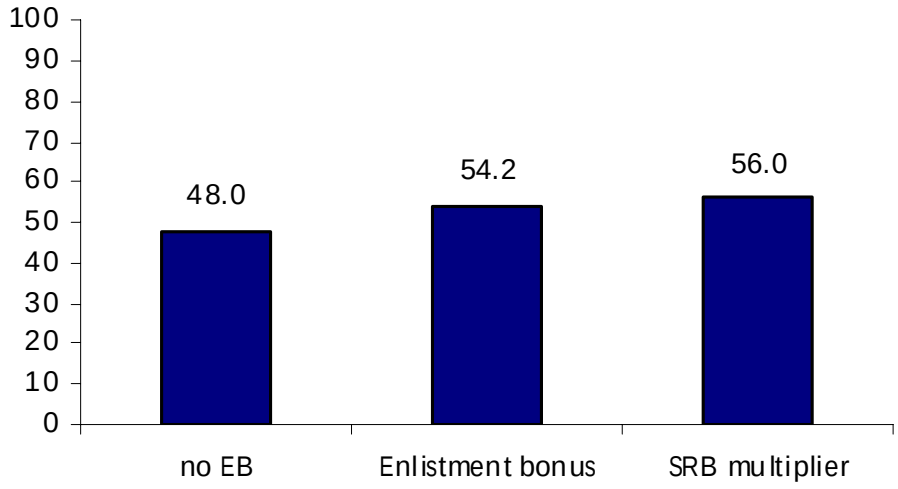


Figure 5 shows the effects of marriage and children on retention rates. Sailors married at the retention decision point had retention rates nearly 6 percentage points, or 12 percent, higher than unmarried Sailors. Retention rates of those both married and with dependents were 20 percent higher than the rates of unmarried Sailors.

Figure 6 illustrates the magnitude of the effects of selected ratings on the expected retention rate. Retention rates vary by nearly 40 percentage points due to occupational differences. Yeoman had the highest retention rate (69.4 percent), while electronics technician had one of the lowest rates (30.3 percent), other factors being equal. ETs and NF Sailors would reenlist at less than half the rate of YNs. All else being equal, many technical ratings would have very low retention rates if SRBs were not used to maintain desired retention levels.

Figure 5. Retention effects of marriage and children

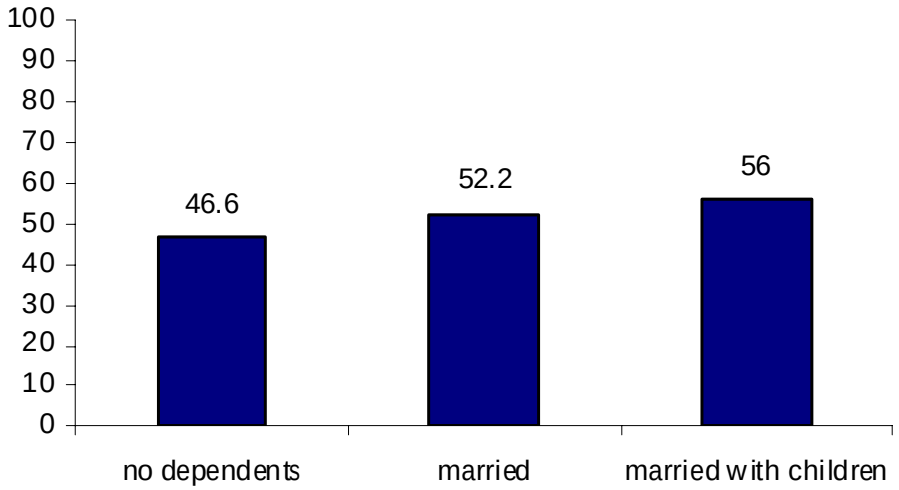


Figure 6. Retention estimates for certain ratings

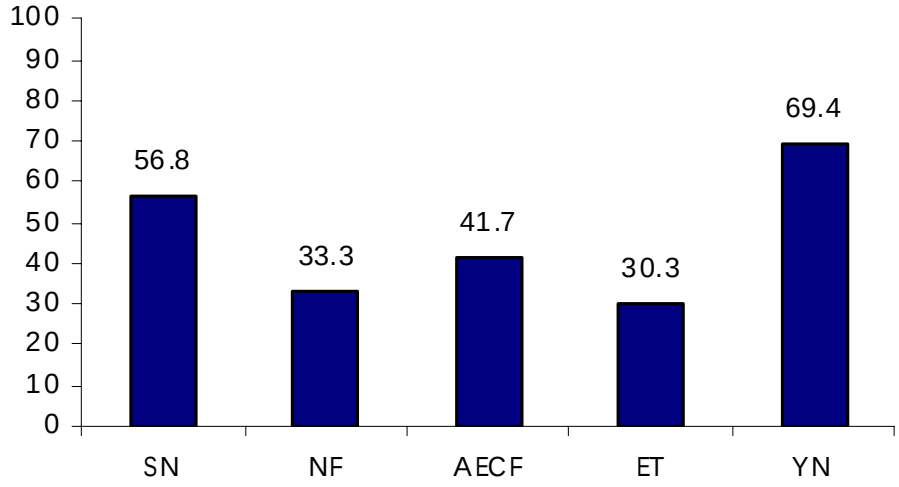
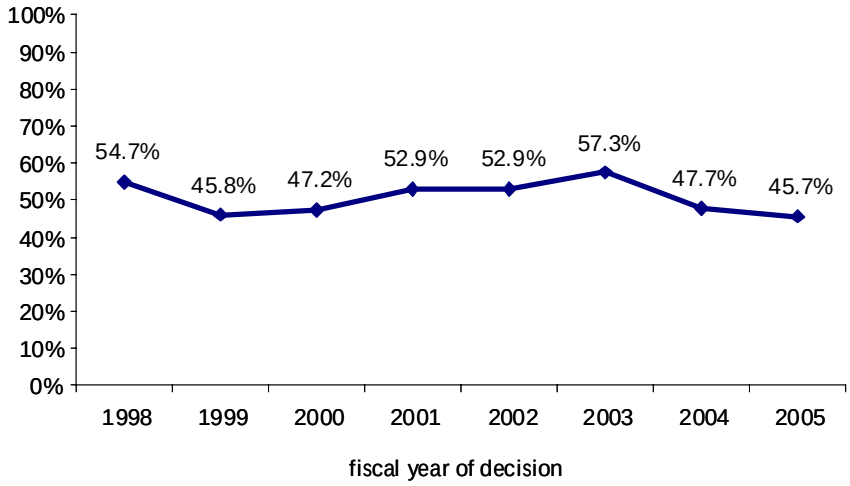


Figure 7 illustrates the cohort effects. FY 2003 had the highest retention rate (57.3 percent), while 2005 had the lowest rate (45.7 percent) for the cohorts evaluated. While we did not have economic factors in our model, we believe that the cohort effects are likely to be related to economic conditions for most years. This range of retention effects provides some guidance as to how much economic factors are likely to affect Navy retention in the future.

Figure 7. Fiscal year retention effects



We also examined how educational benefit use would change as a result of expanded benefit programs. Our data showed that about 50 percent of the Sailors who had separated had used benefits as of the end of our benefit use data (2005), ranging from 48.8 percent for a Sailor with GI Bill benefits only, up to 57.8 percent for NCF recipients.

We expect that benefit use will increase over time, especially for Sailors who have had limited time since separation. Figure 8 shows how the probability of benefit use increases over time, based on the months and months-squared factors we estimated in our benefit use model. Benefit use increases rapidly for about 3 years but does not reach a peak until about 6 years after separation.

We applied a factor of 6 years (72 months) to our data set to estimate what percentage of Sailors would eventually use benefits under different benefit levels. Figure 9 provides the results of these projections. Here we can see the effects of the NCF. We expect that the NCF would result in benefit use rates more than 8 percentage points higher than the GI Bill and that the Post-9/11 GI Bill would generate more than a 10-percentage-point increase in benefit use.

Figure 8. Cumulative probability of using benefits by time since separation

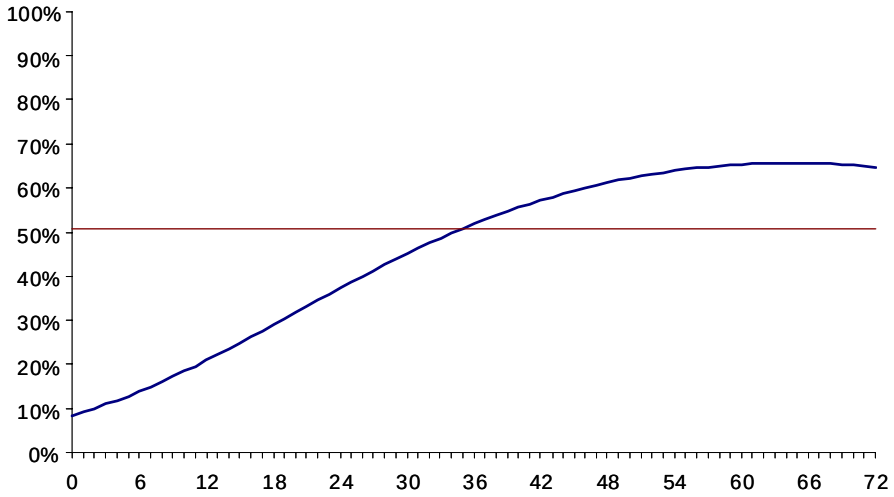
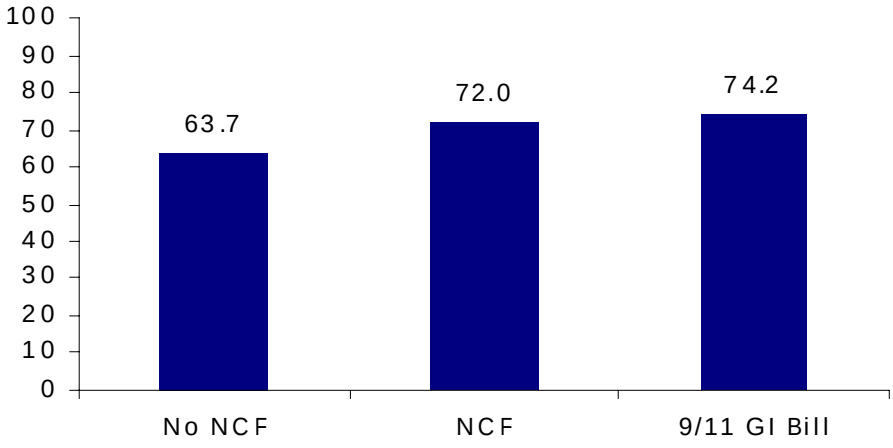


Figure 9. Projected cumulative benefit use for NCF and Post-9/11 GI Bill



Retention effects for NF Sailors

In addition to analyzing the overall impact on Sailors, we focused on nuclear field Sailors in a separate model. We include the same explanatory variables to determine if the increase in education benefits

could have a larger impact on NF Sailors. Our sample of NF accessions between 1995 and 2001 included over 10,000 Sailors, 62 percent of whom reenlisted.

Our analysis does find a larger impact of the new GI Bill for NF Sailors. The new education benefits can be expected to decrease retention of NF Sailors by almost 5 percentage points. However, SRB had a significant positive impact on retention, similar to other ratings. An increase in the SRB multiplier by 1 unit would cancel any effect of the NCF.

The likelihood of NF Sailors reenlisting was positively related to being married at the decision point, whereas females and Hispanics were significantly less likely to reenlist. We also find that Sailors who make their reenlistment decision as an E4 are more likely to reenlist than Sailors at any other paygrade.

NF Sailors were just as likely to use benefits as Sailors in other ratings, with 51 percent of our sample using GI Bill benefits compared with 50 percent of the overall sample. Those NF Sailors who took the NCF experienced an increase of about 9 percentage points in the likelihood of using benefits, similar to the increase found in other ratings.

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Analysis of benefit transferability

One of the innovative parts of the Post-9/11 GI Bill is that the program offers military personnel the opportunity to transfer benefits to a spouse or child. This provision is intended to provide the services with a way to obviate the expected negative retention effects of the increased educational benefits.

The Defense Manpower Data Center surveyed over 9,000 active duty military personnel during July and August 2008 on a variety of topics, including retention and perception of the changes to military education benefits. In addition to questions on retention intentions, current GI Bill benefit eligibility, and use intentions, the survey asked a number of questions about the Post-9/11 GI Bill. The survey included officers and enlisted personnel, as well as background characteristics, such as paygrade, years of service, and marital and dependent status.

Our approach to analyzing the survey was to focus on three questions that addressed use of GI Bill benefits and transferability. We combined these questions with an initial question on reenlistment intentions. The baseline question on reenlistment was:

> Suppose that you have to decide to stay on active duty. Assuming you could stay, how likely is it?

We used this question as a baseline for judging the incremental effects of changing educational benefit policy. For looking at the effect of increasing benefits, we examined how many people who initially answered that they intended to reenlist would change their intention.

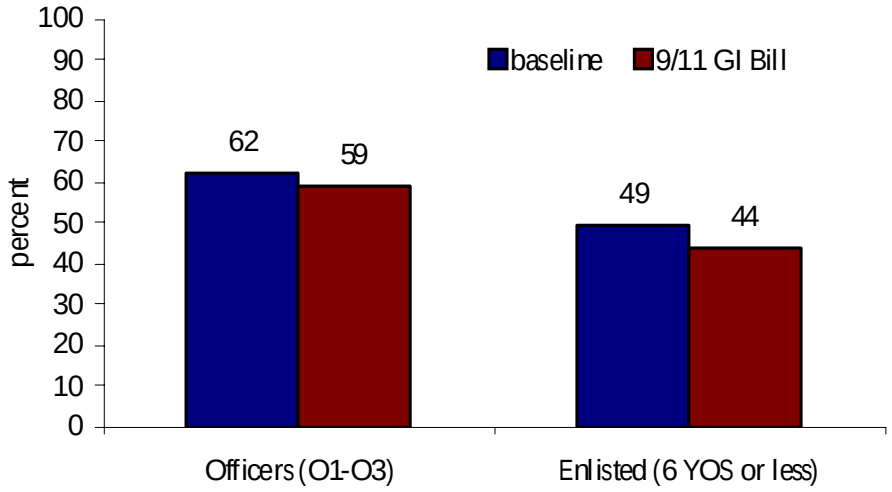
For the Post-9/11 GI Bill effect, the question provided was:

> Suppose you have a GI Bill benefit that covers a monthly cost-of-living stipend and the full cost of in-state tuition at a public university/college. When would you use that benefit?

We would classify those people who selected "I would exit the military at my earliest opportunity to use this benefit" as intending to leave the military because of educational benefits.

Figure 10 shows the results for this question for enlisted personnel with 6 years or less of service and for officers with the rank of O3 or less. Initially, 49 percent of enlisted personnel and 62 percent of officers stated that they planned to stay. The MGIB Compass report indicated that 23 percent of enlisted personnel and 9 percent of officers would leave at the first reenlistment point. Our analysis, restricting the effects to only those who had initially not planned to leave, found that enlisted intentions to reenlist would decline by 11 percent and officers' intentions would decline by 5 percent.

Figure 10. Survey estimate of Post-9/11 GI Bill retention effect

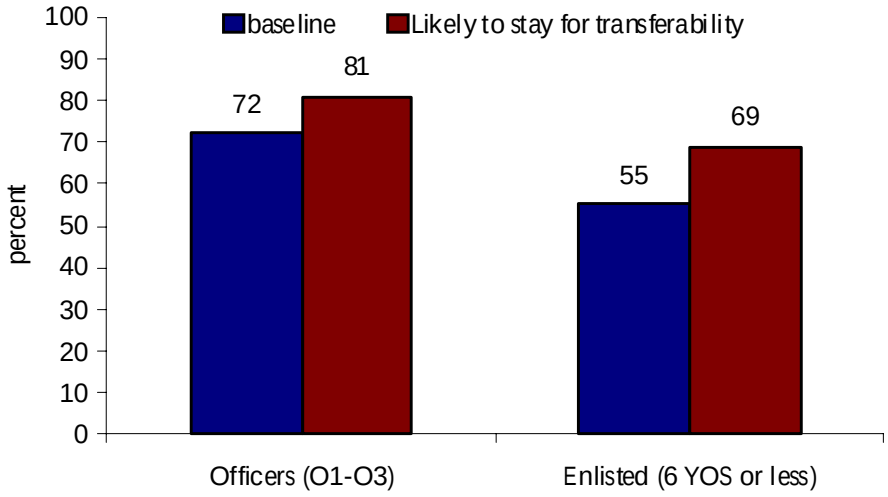


For identifying the effects of transferability, we used two questions from the Compass survey. The first question asks those who are married or have dependents:

> Suppose to be able to transfer GI Bill benefits to your spouse and/or child(ren) you had to reenlist or extend your service commitment. How likely would you be to do this?

Figure 11 shows the results from this question for officers and enlisted personnel. Again, focusing on less senior officers and enlisted personnel, we found that transferability would have a large impact on retention rates, even though these groups had relatively high retention rates to begin with. Officer intentions would increase by 13 percent (9 percentage points), and enlisted rates would increase by 25 percent (14 percentage points).

Figure 11. Survey estimate of retention effect of transferability for personnel with dependents



The second transferability question was addressed to all survey respondents:

> To what extent would you be more likely to stay on active duty if you had the following GI Bill benefits?

We analyzed on the response to the following choice:

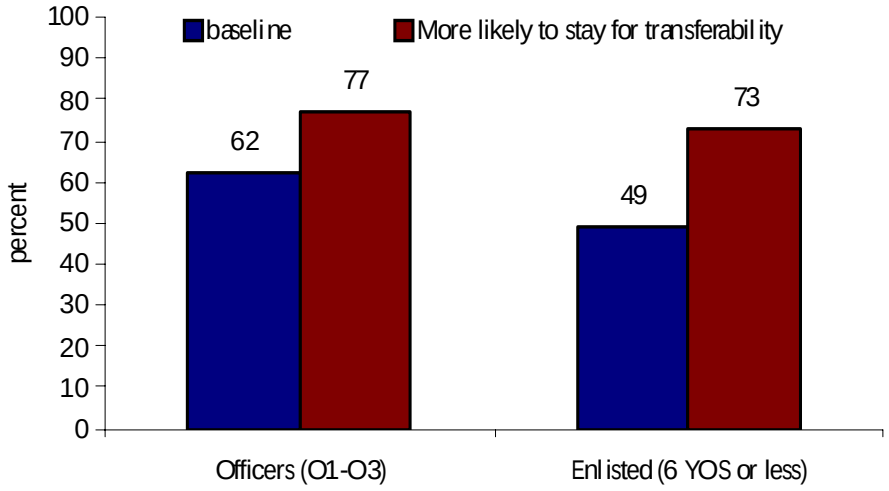
> GI Bill benefit that offers the ability to transfer benefits to spouses and/or child(ren).

The question was asked with a scale ranging from 1 (not at all) to 5 (a very large extent). We focused on those respondents who in their initial assessment of their likelihood of retention had responded with a

3 (neither likely nor unlikely) or less. If respondents indicated that their likelihood of staying would increase by either a large extent (4) or a very large extent (5), we would code them as having increased their intention to stay because of the transferability of benefits.

Figure 12 shows the impact of this definition of transferability retention intention. Offering transferability would increase officer retention rates by 24 percent (15 percentage points) and enlisted retention by 49 percent (24 percentage points). While we don't know to what extent intentions will translate into actual behavior, it does appear that transferability is an attractive feature for all military personnel, including those who currently are neither married nor have dependents.

Figure 12. Survey estimate of increased retention for all personnel



Discussion

We found that the Post-9/11 GI Bill is likely to have a very small effect on retention. The effects we estimated from the NCF may slightly overstate the potential impact, at least in the short run, since NCF takers were presumably self-selecting the benefit (i.e., recruits who chose NCF should be those who are more likely predisposed to attend college). The current Sailors who have the opportunity to receive the Post-9/11 GI Bill benefits did not make any such selection.

The survey data confirm that there will be a negative effect, although the survey data overstate the effect. We estimated that the reduction in retention would be on the order of 1 percentage point, while the survey estimated a 5-percentage-point decline.

In contrast, the survey data indicate that benefit transferability is an attractive feature. Transferability will be most attractive to married Sailors, especially those with children, and these individuals already find military benefits an attractive reenlistment inducement. An increase in the SRB of less than 0.5 (the smallest increment used) would be more than sufficient to counteract the adverse retention effect we projected. Another way to view the effect is to compare the projected adverse retention effect from the Post-9/11 GI Bill with the year-to-year variability in reenlistment rates. Historically, the Navy has managed reenlistment rates that vary from 46 to 57 percent. A change of 1 percentage point would be well within the typical yearly fluctuation.

Given that the survey data refer to intentions and not behavior, the survey data may overstate the impact of transferability. The Navy does not yet have data on service member response to transferability (beyond these survey results), so it will be important to collect these data as they become available.

The SRB will be an effective tool to counteract any adverse retention that would arise from the Post-9/11 GI Bill. To test the sensitivity of this hypothesis, we estimated our retention model separately on the subset of Sailors who had selected the NCF. The SRB produced as strong an effect on this group as it did on the entire Navy population. For example, we found that married Sailors were reenlisting at 6 percentage points higher rate than unmarried Sailors, and those who were married with children reenlisted at a rate nearly 10 percentage points higher. Thus, we are confident that the SRB should be as effective at increasing retention in response to the greater education benefits offered by the Post-9/11 GI Bill.

Economic effects, however, are likely to overwhelm any retention impacts from increased educational benefits. Current retention is extremely high, and our cohort analysis indicates that a decrease on the order of 10 percentage points is possible with improved economic conditions.

While we found that the retention effects of increased educational benefits were small for the Navy, other services may find different results. The DoD actuary [10] provides cost estimates for the college fund based on length of enlistment and historical service benefit use. The actuarial rate charged to the Army for a 4-year enlistment is 59 percent larger, and for the Marines it is 85 percent greater. These higher benefit use factors are likely tied to higher separation rates.

Appendix A: Means of selected variables used in the model

Reenlistment equation used zone A recruits who accessed from 1995-2001.

MGIB equation drops decisions made after December 2004, which cuts off most 2001 accessions.

Reenlistment variables

Table 1. Reenlistment equation variables

Variable	All Zone A decisions	Reenlisters	Non-reenlisters
Count	153,175	75,845	77,330
% Reenlisted	0.50	1.00	0.00
Enlistment Bonus	0.24	0.28	0.20
Navy College Fund	0.23	0.21	0.24
NCF & EB	0.01	0.01	0.004
SRB	1.66	2.03	1.29
2 YO	0.00	0.003	0.01
3 YO	0.08	0.05	0.12
4 YO	0.62	0.60	0.63
5 YO	0.13	0.14	0.12
6 YO	0.16	0.20	0.13
Age	19.65	19.81	19.50
Female	0.16	0.16	0.17
White	0.70	0.65	0.74
Black	0.20	0.24	0.17
Asian/Pacific Islander	0.06	0.07	0.05
Native American	0.03	0.03	0.03
Other ethnicity / Unknown	0.01	0.01	0.01
Hispanic	0.16	0.15	0.16
Married	0.04	0.05	0.03
Children	0.05	0.06	0.03

Table 1. Reenlistment equation variables (continued)

Variable	All Zone A decisions	Reenlisters	Non-reenlisters
High school degree	0.84	0.83	0.85
GED	0.03	0.03	0.02
Some college	0.10	0.11	0.09
Bachelor's degree	0.01	0.01	0.01
Other education	0.005	0.005	0.01
AFQT	59.53	60.13	58.94
% College attendance	35.42	35.35	35.49
% Veterans	35.20	34.98	35.41
Median family income	41752.52	41464.09	42035.33
E1 at decision	0.001	0.0001	0.003
E2 at decision	0.01	0.001	0.01
E3 at decision	0.12	0.08	0.17
E4 at decision	0.57	0.60	0.54
E5 at decision	0.29	0.32	0.27
E6 at decision	0.01	0.004	0.01
Married at decision	0.33	0.37	0.29
Children at decision	0.27	0.33	0.21
FY95 decision	0.00003	0.00003	0.00004
FY96 decision	0.0001	0.0001	0.0001
FY97 decision	0.004	0.005	0.003
FY98 decision	0.03	0.02	0.05
FY99 decision	0.09	0.07	0.11
FY00 decision	0.12	0.12	0.13
FY01 decision	0.15	0.17	0.13
FY02 decision	0.13	0.14	0.11
FY03 decision	0.14	0.16	0.12
FY04 decision	0.13	0.12	0.13
FY05 decision	0.13	0.13	0.13
FY06 decision	0.06	0.05	0.06
FY07 decision	0.02	0.01	0.02
FY08 decision	0.00005	0.00003	0.0001

MGIB variables

This is only looking at those in the prior sample who did not reenlist, and it cuts off the decision date at December 2004.

Table 2. MGIB equation means (those who didn't reenlist)

Variable	All MGIB observations	MGIB users	Non-MGIB users
Count	62,512	31,715	30,797
% Using MGIB benefits	0.51	1.00	0.00
Months since reenlistment decision	44.81	49.51	39.82
Enlistment Bonus	0.15	0.11	0.19
Navy College Fund	0.23	0.27	0.18
NCF & EB	0.001	0.001	0.001
SRB	1.23	1.34	1.13
2 YO	0.01	0.01	0.01
3 YO	0.14	0.16	0.12
4 YO	0.64	0.62	0.66
5 YO	0.11	0.11	0.11
6 YO	0.11	0.10	0.11
Age	19.51	19.38	19.65
Female	0.17	0.19	0.14
White	0.75	0.74	0.75
Black	0.17	0.17	0.17
Asian/Pacific Islander	0.05	0.05	0.04
Native American	0.03	0.03	0.03
Other ethnicity / Unknown	0.01	0.01	0.01
Hispanic	0.16	0.17	0.14
Married	0.03	0.02	0.03
Children	0.03	0.03	0.04
High school degree	0.85	0.86	0.84
GED	0.02	0.02	0.03
Some college	0.09	0.10	0.09
Bachelor's degree	0.01	0.01	0.02
Other education	0.005	0.003	0.01
AFQT	58.26	60.23	56.27
% College attendance	35.33	35.44	35.21
% Veterans	36.15	36.48	35.80

Table 2. MGIB equation means (those who didn't reenlist) (continued)

Variable	All MGIB observations	MGIB users	Non-MGIB users
Median family income	42061.84	42370.53	41745.04
E1 at decision	0.003	0.002	0.004
E2 at decision	0.01	0.01	0.02
E3 at decision	0.18	0.16	0.19
E4 at decision	0.55	0.55	0.55
E5 at decision	0.25	0.27	0.23
E6 at decision	0.01	0.01	0.01
Married at decision	0.26	0.22	0.30
Children at decision	0.20	0.16	0.24
FY95 decision	0.00005	0.00003	0.00003
FY96 decision	0.0002	0.0002	0.0002
FY97 decision	0.004	0.01	0.003
FY98 decision	0.06	0.07	0.04
FY99 decision	0.14	0.16	0.12
FY00 decision	0.16	0.18	0.14
FY01 decision	0.17	0.19	0.14
FY02 decision	0.14	0.16	0.12
FY03 decision	0.14	0.15	0.14
FY04 decision	0.16	0.09	0.24
FY05 decision	0.03	0.002	0.06

Appendix B: Regression model results

Table 3. Reenlistment equation

Variable	Coefficient	Standard Error	Z
Enlistment Bonus	0.27	0.02	15.49
Navy College Fund	-0.05	0.02	-3.38
NCF & EB	0.06	0.08	0.72
SRB	0.32	0.00	68.10
2 YO	-0.05	0.13	-0.38
3 YO	-0.40	0.03	-14.75
5 YO	0.75	0.12	6.43
6 YO	0.77	0.05	16.09
Age	0.03	0.00	11.34
Female	-0.03	0.02	-1.84
Black	0.68	0.02	43.27
Asian/Pacific Islander	0.59	0.03	23.49
Native American	0.12	0.03	3.73
Other ethnicity / Unknown	0.30	0.05	6.19
Hispanic	0.08	0.02	4.50
Married	0.21	0.03	6.25
Children	0.06	0.03	1.94
GED	0.14	0.03	4.12
Some College	0.00	0.02	-0.03
Bachelor's Degree	-0.58	0.06	-10.10
Other education	0.01	0.08	0.12
AFQT	-0.01	0.00	-20.21
% College Attendance[a]	0.00	0.00	-2.53
% Veterans	-0.02	0.00	-15.65
Median family income	0.00	0.00	-8.62
E1 at decision	-3.17	0.36	-8.78
E2 at decision	-2.54	0.13	-19.48
E3 at decision	-0.64	0.02	-33.46
E5 at decision	0.10	0.01	7.13
E6 at decision	-1.16	0.08	-14.69

Table 3. Reenlistment equation (continued)

Variable	Coefficient	Standard Error	Z
Married at decision	0.26	0.01	19.07
Children at decision	0.17	0.01	15.37
FY95 decision	3.56	0.99	3.59
FY96 decision	1.90	0.60	3.19
FY97 decision	1.23	0.10	12.92
FY98 decision	0.41	0.04	10.39
FY00 decision	0.06	0.02	2.59
FY01 decision	0.32	0.02	13.19
FY02 decision	0.32	0.03	12.55
FY03 decision	0.53	0.03	19.96
FY04 decision	0.08	0.03	2.99
FY05 decision	-0.01	0.03	-0.23
FY06 decision	-0.32	0.03	-9.28
FY07 decision	-1.00	0.05	-19.92
FY08 decision	-1.58	0.89	-1.78
ABE rating	-0.59	0.08	-7.25
ABF rating	-0.51	0.09	-5.48
ABH rating	-0.50	0.08	-5.92
AC rating	-0.68	0.13	-5.13
AD rating	0.23	0.05	4.77
ADMN rating	0.28	0.30	0.95
AE rating	-0.20	0.05	-3.90
AEC rating	-0.73	0.06	-12.57
AG rating	0.20	0.09	2.19
AIC rating	-0.65	0.13	-5.09
AIR rating	-0.80	0.13	-6.37
AK rating	0.41	0.08	4.91
AM rating	-0.01	0.06	-0.10
AME rating	-0.10	0.08	-1.21
AMH rating	-0.03	0.09	-0.36
AMS rating	-0.20	0.07	-2.79
AN rating	-0.26	0.02	-11.09
AO rating	-0.58	0.05	-12.75
AORD rating	-0.08	0.48	-0.16
AS rating	0.20	0.08	2.64
AT rating	-0.42	0.04	-10.79
AV rating	0.21	0.10	2.03
AZ rating	0.34	0.08	4.49

Table 3. Reenlistment equation (continued)

Variable	Coefficient	Standard Error	Z
BMA rating	-0.18	0.34	-0.52
BT rating	-0.92	0.17	-5.53
BU rating	-0.20	0.13	-1.49
CE rating	-0.30	0.15	-1.96
CM rating	-0.32	0.14	-2.22
CONT rating	0.37	0.54	0.68
CT1 rating	-0.34	0.31	-1.09
CT2 rating	-0.84	0.20	-4.18
CTA rating	0.74	0.12	6.21
CTI rating	-0.62	0.09	-6.91
CTM rating	-0.35	0.10	-3.32
CTO rating	-0.11	0.08	-1.42
CTT rating	-0.09	0.10	-0.91
DC rating	-0.50	0.07	-7.48
DK rating	0.58	0.11	5.47
DP rating	-1.20	0.21	-5.83
DS rating	-1.42	0.23	-6.24
DT rating	-0.54	0.14	-3.99
EA rating	-0.14	0.21	-0.66
ELCL rating	-0.50	0.32	-1.55
EM rating	-0.35	0.05	-6.57
EN rating	-0.05	0.05	-0.95
ENGR rating	-0.54	0.38	-1.44
EO rating	-0.51	0.14	-3.61
ET rating	-1.32	0.12	-11.19
ETS rating	-1.23	0.15	-8.43
EW rating	-0.33	0.08	-4.12
FC rating	-1.30	0.12	-10.94
FN rating	-0.38	0.03	-12.81
FT rating	-0.62	0.19	-3.32
FTG rating	-0.40	0.50	-0.80
GM rating	-0.19	0.06	-3.29
GSE rating	-0.71	0.08	-8.85
GSM rating	-0.54	0.07	-7.57
HCMB rating	0.04	0.59	0.07
HM rating	-0.52	0.12	-4.39
HT rating	-0.08	0.07	-1.09
IC rating	-0.58	0.07	-8.95

Table 3. Reenlistment equation (continued)

Variable	Coefficient	Standard Error	Z
IM rating	-0.27	0.49	-0.56
IS rating	-0.51	0.07	-7.47
IT rating	-0.28	0.07	-4.04
JO rating	-0.20	0.20	-1.01
LI rating	0.15	0.21	0.72
LLE rating	-0.14	0.22	-0.62
MA rating	-0.31	0.13	-2.43
MCHA rating	-0.84	0.51	-1.65
MED rating	-0.07	0.27	-0.25
ML rating	0.89	1.31	0.68
MM rating	-0.64	0.05	-13.34
MMS rating	-0.14	0.07	-2.01
MN rating	-0.14	0.12	-1.14
MR rating	-0.21	0.13	-1.55
MS rating	0.02	0.05	0.35
MSS rating	-0.40	0.11	-3.72
MT rating	0.24	0.13	1.89
MU rating	1.52	0.16	9.73
NAV rating	0.36	0.48	0.75
NF rating	-1.15	0.06	-19.34
OM rating	-0.59	0.54	-1.10
OPCM rating	-0.20	0.23	-0.87
ORDN rating	-0.38	0.55	-0.69
OS rating	-0.40	0.04	-10.14
PC rating	-0.19	0.18	-1.07
PH rating	-0.55	0.17	-3.17
PM rating	-0.56	0.93	-0.60
PN rating	0.45	0.08	5.38
PR rating	0.10	0.09	1.05
QM rating	-0.21	0.09	-2.41
QMS rating	-0.41	1.43	-0.29
RM rating	-0.76	0.04	-17.48
RP rating	0.41	0.15	2.81
SEC rating	-0.73	0.13	-5.41
SH rating	-0.10	0.08	-1.29
SK rating	0.60	0.07	8.20
SKS rating	0.60	0.18	3.40
SM rating	-0.19	0.09	-2.21

Table 3. Reenlistment equation (continued)

Variable	Coefficient	Standard Error	Z
SPE rating	-1.25	0.09	-14.55
SPSV rating	0.31	0.41	0.77
SS rating	-0.05	0.07	-0.68
ST1 rating	-0.57	0.11	-5.31
ST2 rating	-0.42	0.08	-5.19
ST3 rating	0.27	0.17	1.63
ST4 rating	-0.28	0.07	-3.96
ST5 rating	-0.64	0.20	-3.11
ST6 rating	-0.38	0.78	-0.49
ST7 rating	-0.36	0.18	-2.07
ST8 rating	-0.06	0.21	-0.30
ST9 rating	-0.21	0.12	-1.69
STG rating	-0.47	0.06	-7.34
STS rating	-0.76	0.08	-9.72
SW rating	-0.30	0.16	-1.82
TM rating	0.08	0.11	0.75
TMS rating	-0.76	0.26	-2.92
UT rating	-0.33	0.16	-2.13
YN rating	0.64	0.06	11.10
YNS rating	0.66	0.17	3.93
CTstar rating	0.01	0.06	0.20
Constant	0.31	0.10	3.03

a. Cofficient is -.0037934, std. error is .0015002.

Table 4. MGIB use equation

Variable	Coefficient	Standard error	Z
Months since reenlistment decision[a]	0.10	0.01	17.37
Months since reenlistment decision squared[b]	0.00	0.00	-14.35
Enlistment Bonus	0.06	0.03	1.79
Navy College Fund	0.40	0.03	16.07
NCF & EB	0.10	0.27	0.38
2 YO	0.41	0.16	2.64
3 YO	0.06	0.04	1.56
5 YO	0.18	0.16	1.14
6 YO	-0.34	0.09	-3.91
Age	-0.06	0.00	-13.57
Female	0.47	0.02	18.75
Black	0.29	0.03	11.18
Asian/Pacific Islander	0.50	0.04	11.36
Native American	0.08	0.05	1.45
Other ethnicity / Unknown	-0.01	0.09	-0.09
Hispanic	0.36	0.03	13.41
Married	-0.07	0.06	-1.19
Children	0.11	0.05	2.10
GED	-0.28	0.06	-4.60
Some College	0.17	0.03	5.46
Bachelor's Degree	-0.65	0.09	-7.53
Other education	-0.12	0.14	-0.87
AFQT	0.01	0.00	19.46
% College Attendance	0.01	0.00	6.36
% Veterans	-0.01	0.00	-4.07
Median family income	0.00	0.00	1.34
E1 at decision	-0.56	0.17	-3.39
E2 at decision	-0.50	0.08	-6.41
E3 at decision	-0.23	0.03	-8.60
E5 at decision	0.19	0.02	7.54
E6 at decision	0.17	0.11	1.49
Married at decision	-0.32	0.02	-14.19
Children at decision	-0.19	0.02	-8.89
FY95 decision	2.15	1.44	1.49
FY96 decision	1.97	0.69	2.87
FY97 decision	1.15	0.17	6.63
FY98 decision	0.49	0.07	7.05

Table 4. MGIB use equation (continued)

Variable	Coefficient	Standard error	Z
FY00 decision	-0.18	0.05	-3.53
FY01 decision	-0.04	0.08	-0.55
FY02 decision	0.32	0.10	3.24
FY03 decision	0.73	0.13	5.82
FY04 decision	0.55	0.16	3.54
FY05 decision	-1.69	0.23	-7.29
ABE rating	-0.23	0.12	-1.87
ABF rating	-0.10	0.14	-0.71
ABH rating	-0.12	0.11	-1.05
AC rating	-0.52	0.20	-2.63
AD rating	0.05	0.08	0.69
ADMN rating	1.96	0.68	2.86
AE rating	-0.21	0.08	-2.62
AEC rating	-0.06	0.10	-0.61
AG rating	0.39	0.15	2.57
AIC rating	-0.10	0.18	-0.53
AIR rating	-0.26	0.18	-1.45
AK rating	-0.16	0.15	-1.13
AM rating	-0.18	0.12	-1.48
AME rating	-0.31	0.15	-2.06
AMH rating	-0.39	0.14	-2.77
AMS rating	-0.40	0.10	-3.98
AN rating	-0.01	0.03	-0.30
AO rating	0.02	0.07	0.34
AS rating	-0.33	0.12	-2.70
AT rating	-0.06	0.06	-1.01
AZ rating	0.09	0.12	0.75
BMA rating	0.78	0.56	1.40
BT rating	-0.40	0.19	-2.14
BU rating	-1.23	0.20	-6.16
CE rating	-1.02	0.24	-4.30
CM rating	-0.98	0.21	-4.68
CONT rating	1.37	1.26	1.10
CT1 rating	0.32	0.47	0.69
CT2 rating	0.34	0.30	1.12
CTA rating	0.29	0.22	1.30
CTI rating	-0.34	0.16	-2.13
CTM rating	-0.36	0.20	-1.80

Table 4. MGIB use equation (continued)

Variable	Coefficient	Standard error	Z
CTO rating	-0.28	0.12	-2.32
CTT rating	-0.02	0.17	-0.09
DC rating	-0.25	0.09	-2.89
DK rating	-0.07	0.19	-0.38
DP rating	-0.63	0.24	-2.63
DS rating	-0.03	0.33	-0.10
DT rating	0.17	0.21	0.82
EA rating	-0.44	0.35	-1.26
ELCL rating	0.53	0.52	1.02
EM rating	-0.23	0.08	-2.95
EN rating	-0.39	0.09	-4.50
ENGR rating	-0.53	0.78	-0.68
EO rating	-1.27	0.20	-6.35
ET rating	-0.36	0.17	-2.08
ETS rating	-0.31	0.21	-1.45
EW rating	0.01	0.13	0.09
FC rating	-0.12	0.18	-0.68
FN rating	-0.17	0.04	-4.11
FT rating	0.24	0.33	0.73
FTG rating	0.21	0.88	0.24
GM rating	-0.19	0.08	-2.31
GSE rating	-0.20	0.11	-1.82
GSM rating	-0.19	0.11	-1.81
HCMB rating	-0.07	1.23	-0.05
HM rating	0.19	0.16	1.15
HT rating	-0.51	0.13	-3.96
IC rating	-0.23	0.09	-2.56
IM rating	-1.09	0.59	-1.85
IS rating	-0.02	0.10	-0.20
IT rating	-0.46	0.18	-2.59
JO rating	-0.15	0.32	-0.47
LI rating	0.02	0.31	0.07
LLE rating	-0.87	1.20	-0.72
MA rating	-1.02	1.06	-0.96
MCHA rating	0.98	0.76	1.29
MED rating	0.11	0.82	0.14
MM rating	-0.30	0.07	-4.23
MMS rating	-0.41	0.13	-3.26

Table 4. MGIB use equation (continued)

Variable	Coefficient	Standard error	Z
MN rating	-0.12	0.24	-0.49
MR rating	-0.46	0.19	-2.35
MS rating	-0.30	0.08	-3.81
MSS rating	-0.69	0.18	-3.91
MT rating	0.14	0.32	0.44
MU rating	0.10	0.29	0.33
NAV rating	0.15	1.12	0.14
NF rating	-0.19	0.10	-1.90
OM rating	0.61	0.69	0.88
OPCM rating	-0.85	0.50	-1.70
ORDN rating	-0.86	1.07	-0.80
OS rating	0.16	0.06	2.56
PC rating	-0.20	0.24	-0.81
PH rating	-0.48	0.26	-1.82
PN rating	0.34	0.14	2.54
PR rating	-0.36	0.17	-2.17
QM rating	0.18	0.13	1.36
RM rating	-0.15	0.06	-2.50
RP rating	0.67	0.27	2.51
SEC rating	-0.32	0.31	-1.01
SH rating	0.18	0.13	1.37
SK rating	-0.21	0.13	-1.67
SKS rating	-0.16	0.31	-0.51
SM rating	0.17	0.14	1.27
SPE rating	0.13	0.12	1.07
SPSV rating	0.14	0.83	0.17
SS rating	-0.14	0.11	-1.23
ST1 rating	-0.28	0.14	-1.94
ST2 rating	-0.04	0.12	-0.30
ST3 rating	-0.10	0.25	-0.40
ST4 rating	0.08	0.11	0.76
ST5 rating	-0.24	0.26	-0.94
ST6 rating	0.05	1.00	0.05
ST7 rating	0.11	0.28	0.39
ST8 rating	0.15	0.36	0.42
ST9 rating	-1.26	0.61	-2.08
STG rating	0.09	0.11	0.83
STS rating	0.04	0.12	0.35

Table 4. MGIB use equation (continued)

Variable	Coefficient	Standard error	Z
SW rating	-0.79	0.26	-3.02
TM rating	0.16	0.16	1.00
TMS rating	0.08	0.31	0.25
UT rating	-0.92	0.25	-3.74
YN rating	0.17	0.10	1.67
YNS rating	0.34	0.32	1.07
CTstar rating	-0.09	0.10	-0.91
Constant	-2.78	0.25	-11.21

a. Months_sq is -0.0008032, std. err is 0.000056.
b. Median income is 0.00000127, std. err is 0.000000945.

Table 5 shos the results from the two-stage Heckman procedure, where the first stage estimates the probability a Sailor separates, instead of the probability of reenlisting. Hence, coefficients have the opposite sign of coefficients estimated in table 3.

Table 5. Heckman model results

Variable	Coefficient	Standard error	Z
Benefit Use equation			
Months since reenlistment decision	0.02	0.00	17.14
Months since reenlistment decision squared	0.00	0.00	-14.06
Enlistment Bonus	0.02	0.01	2.22
Navy College Fund	0.09	0.01	16.23
NCF & EB	0.00	0.06	0.06
2 YO	0.08	0.03	2.45
3 YO	0.01	0.01	1.50
5 YO	0.05	0.04	1.54
6 YO	-0.07	0.02	-3.76
Age	-0.01	0.00	-13.38
Female	0.10	0.01	18.63
Black	0.06	0.01	9.80
Asian / Pacific Islander	0.11	0.01	10.98
Native American	0.02	0.01	1.44
Other ethnicity / Unknown	0.00	0.02	-0.14
Hispanic	0.08	0.01	13.51
Married	-0.02	0.01	-1.32
Children	0.02	0.01	2.19
GED	-0.06	0.01	-4.50
Some College	0.04	0.01	5.47
Bachelor's Degree	-0.14	0.02	-7.63
Other education	-0.02	0.03	-0.80
AFQT	0.00	0.00	19.43
% College Attendance	0.00	0.00	6.40
% Veterans	0.00	0.00	-3.91
Median family income	0.00	0.00	1.34
E1 at decision	-0.12	0.04	-3.34
E2 at decision	-0.11	0.02	-6.01
E3 at decision	-0.05	0.01	-7.67
E5 at decision	0.04	0.01	7.33
E6 at decision	0.03	0.03	1.30
Married at decision	-0.07	0.01	-13.74
Children at decision	-0.04	0.00	-8.52
FY95 decision	0.45	0.33	1.36
FY96 decision	0.42	0.15	2.71
FY97 decision	0.25	0.04	6.68

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
FY98 decision	0.11	0.02	6.97
FY00 decision	-0.04	0.01	-3.59
FY01 decision	-0.01	0.02	-0.68
FY02 decision	0.06	0.02	2.95
FY03 decision	0.14	0.03	5.19
FY04 decision	0.10	0.03	2.87
FY05 decision	-0.04	0.04	-0.93
ABE rating	-0.05	0.03	-1.80
ABF rating	-0.02	0.03	-0.60
ABH rating	-0.03	0.02	-1.10
AC rating	-0.13	0.04	-3.03
AD rating	0.01	0.02	0.59
ADMN rating	0.43	0.14	3.09
AE rating	-0.04	0.02	-2.55
AEC rating	-0.02	0.02	-0.69
AG rating	0.08	0.03	2.66
AIC rating	-0.04	0.04	-0.89
AIR rating	-0.07	0.04	-1.77
AK rating	-0.04	0.03	-1.24
AM rating	-0.04	0.02	-1.49
AME rating	-0.06	0.03	-1.96
AMH rating	-0.09	0.03	-2.84
AMS rating	-0.09	0.02	-4.12
AN rating	0.00	0.01	-0.44
AO rating	0.01	0.02	0.36
AORD rating	-0.16	0.16	-1.01
AS rating	-0.07	0.03	-2.73
AT rating	-0.01	0.01	-0.94
AV rating	-0.25	0.16	-1.54
AZ rating	0.02	0.03	0.80
BMA rating	0.15	0.12	1.26
BT rating	-0.09	0.04	-2.17
BU rating	-0.26	0.04	-6.23
CE rating	-0.23	0.05	-4.50
CM rating	-0.22	0.05	-4.89
CONT rating	0.30	0.27	1.12
CT1 rating	0.07	0.10	0.69
CT2 rating	0.07	0.06	1.11

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
CTA rating	0.06	0.05	1.29
CTI rating	-0.07	0.03	-2.15
CTM rating	-0.08	0.04	-1.86
CTO rating	-0.06	0.03	-2.29
CTT rating	0.00	0.04	-0.07
DC rating	-0.06	0.02	-2.89
DK rating	-0.01	0.04	-0.26
DP rating	-0.14	0.05	-2.57
DS rating	-0.01	0.07	-0.07
DT rating	0.02	0.04	0.50
EA rating	-0.10	0.08	-1.35
ELCL rating	0.09	0.11	0.88
EM rating	-0.05	0.02	-2.92
EN rating	-0.08	0.02	-4.55
ENGR rating	-0.05	0.12	-0.39
EO rating	-0.27	0.04	-6.51
ET rating	-0.08	0.04	-2.13
ETS rating	-0.08	0.05	-1.69
EW rating	0.00	0.03	0.02
FC rating	-0.02	0.04	-0.58
FN rating	-0.04	0.01	-4.10
FT rating	0.05	0.07	0.66
FTG rating	0.05	0.19	0.28
GM rating	-0.04	0.02	-2.27
GSE rating	-0.04	0.02	-1.75
GSM rating	-0.04	0.02	-1.68
HCMB rating	-0.01	0.23	-0.04
HM rating	0.02	0.04	0.67
HT rating	-0.11	0.03	-4.12
IC rating	-0.05	0.02	-2.64
IM rating	-0.25	0.13	-1.91
IS rating	0.00	0.02	-0.13
IT rating	-0.10	0.03	-3.17
JO rating	-0.05	0.07	-0.78
LI rating	0.01	0.07	0.11
LLE rating	-0.14	0.16	-0.88
MA rating	-0.11	0.12	-0.87
MCHA rating	0.18	0.16	1.08

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
MED rating	0.00	0.18	0.01
ML rating	0.47	0.46	1.01
MM rating	-0.07	0.02	-4.26
MMS rating	-0.09	0.03	-3.22
MN rating	-0.03	0.05	-0.55
MR rating	-0.11	0.04	-2.52
MS rating	-0.06	0.02	-3.83
MSS rating	-0.15	0.04	-3.89
MT rating	0.02	0.07	0.34
MU rating	0.02	0.06	0.33
NAV rating	0.03	0.19	0.18
NF rating	-0.04	0.02	-1.99
OM rating	0.13	0.14	0.94
OPCM rating	-0.15	0.09	-1.74
ORDN rating	-0.14	0.16	-0.85
OS rating	0.03	0.01	2.67
PC rating	-0.04	0.05	-0.83
PH rating	-0.12	0.06	-2.08
PM rating	-0.56	0.23	-2.43
PN rating	0.07	0.03	2.51
PR rating	-0.08	0.04	-2.11
QM rating	0.04	0.03	1.47
QMS rating	-0.55	0.46	-1.18
RM rating	-0.03	0.01	-2.20
RP rating	0.14	0.05	2.51
SEC rating	-0.08	0.06	-1.29
SH rating	0.04	0.03	1.46
SK rating	-0.05	0.03	-1.68
SKS rating	-0.03	0.07	-0.39
SM rating	0.04	0.03	1.27
SPE rating	0.03	0.03	1.00
SPSV rating	0.03	0.16	0.21
SS rating	-0.03	0.02	-1.20
ST1 rating	-0.07	0.03	-2.01
ST2 rating	-0.01	0.03	-0.33
ST3 rating	-0.02	0.06	-0.37
ST4 rating	0.02	0.02	0.76
ST5 rating	-0.06	0.06	-1.02

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
ST6 rating	0.01	0.23	0.03
ST7 rating	0.03	0.06	0.57
ST8 rating	0.02	0.08	0.32
ST9 rating	-0.10	0.06	-1.61
STG rating	0.02	0.02	0.83
STS rating	0.01	0.03	0.59
SW rating	-0.17	0.06	-3.10
TM rating	0.04	0.04	1.08
TMS rating	0.02	0.07	0.28
UT rating	-0.21	0.05	-3.95
YN rating	0.03	0.02	1.63
YNS rating	0.08	0.07	1.10
CTstar rating	-0.02	0.02	-0.93
Constant	-0.08	0.05	-1.43
Separation equation (1 = did not reenlist)			
Enlistment Bonus	-0.16	0.01	-13.27
Navy College Fund	0.05	0.01	4.57
NCF & EB	-0.56	0.08	-6.72
SRB	-0.22	0.00	-70.85
2 YO	-0.02	0.08	-0.31
3 YO	0.22	0.02	13.28
5 YO	-0.55	0.08	-7.25
6 YO	-0.47	0.03	-13.89
Age	-0.02	0.00	-11.56
Female	0.01	0.01	0.56
Black	-0.42	0.01	-40.07
Asian / Pacific Islander	-0.38	0.02	-22.25
Native American	-0.09	0.02	-4.18
Other ethnicity / Unknown	-0.20	0.04	-5.69
Hispanic	-0.05	0.01	-3.99
Married	-0.13	0.02	-5.86
Children	-0.04	0.02	-2.24
GED	-0.11	0.02	-4.42
Some College	0.01	0.01	0.90
Bachelor's Degree	0.38	0.04	9.97
Other education	-0.02	0.06	-0.40
AFQT	0.01	0.00	17.66
% College Attendance	0.00	0.00	2.24

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
% Veterans	0.02	0.00	15.62
Median family income	0.00	0.00	8.78
E1 at decision	1.68	0.17	9.71
E2 at decision	1.33	0.07	19.92
E3 at decision	0.34	0.01	26.71
E5 at decision	-0.03	0.01	-2.64
E6 at decision	0.96	0.06	16.89
Married at decision	-0.15	0.01	-16.52
Children at decision	-0.10	0.01	-12.48
FY95 decision	-2.15	0.65	-3.29
FY96 decision	-1.14	0.33	-3.50
FY97 decision	-0.73	0.06	-12.18
FY98 decision	-0.23	0.02	-9.83
FY00 decision	-0.03	0.02	-2.02
FY01 decision	-0.18	0.02	-12.11
FY02 decision	-0.19	0.02	-11.91
FY03 decision	-0.33	0.02	-19.87
FY04 decision	-0.06	0.02	-3.41
FY05 decision	-0.32	0.02	-13.14
ABE rating	0.41	0.06	7.08
ABF rating	0.34	0.06	5.34
ABH rating	0.31	0.06	5.49
AC rating	0.50	0.09	5.65
AD rating	-0.12	0.03	-3.66
ADMN rating	-0.24	0.25	-0.97
AE rating	0.19	0.04	5.31
AEC rating	0.31	0.04	7.49
AG rating	-0.14	0.06	-2.26
AIC rating	0.54	0.08	6.38
AIR rating	0.63	0.08	7.70
AK rating	-0.30	0.06	-5.11
AM rating	0.05	0.04	1.13
AME rating	0.18	0.06	3.09
AMH rating	0.02	0.06	0.33
AMS rating	0.13	0.04	3.03
AN rating	0.18	0.02	11.51
AO rating	0.43	0.03	13.78
AORD rating	0.48	0.34	1.41

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
AS rating	-0.13	0.05	-2.54
AT rating	0.31	0.03	12.18
AV rating	-0.87	0.24	-3.62
AZ rating	-0.22	0.05	-4.21
BMA rating	-0.13	0.24	-0.51
BT rating	0.58	0.10	5.75
BU rating	0.18	0.09	2.01
CE rating	0.23	0.10	2.22
CM rating	0.23	0.09	2.53
CONT rating	-0.56	0.44	-1.29
CT1 rating	0.26	0.19	1.35
CT2 rating	0.56	0.12	4.56
CTA rating	-0.50	0.08	-6.17
CTI rating	0.35	0.07	5.22
CTM rating	0.13	0.07	1.77
CTO rating	0.13	0.05	2.54
CTT rating	0.09	0.07	1.28
DC rating	0.30	0.05	6.61
DK rating	-0.38	0.07	-5.15
DP rating	0.80	0.12	6.38
DS rating	0.93	0.14	6.75
DT rating	0.43	0.09	4.71
EA rating	0.19	0.15	1.29
ELCL rating	0.79	0.26	2.98
ELCT rating	-6.57	.	.
EM rating	0.24	0.04	6.49
EN rating	0.03	0.04	0.72
ENGR rating	0.58	0.30	1.95
EO rating	0.36	0.09	3.94
ET rating	0.86	0.07	11.82
ETS rating	0.94	0.09	10.12
EW rating	0.26	0.05	4.72
FC rating	0.85	0.07	11.42
FN rating	0.25	0.02	12.62
FT rating	0.48	0.12	4.13
FTG rating	0.31	0.30	1.06
GM rating	0.15	0.04	3.80
GSE rating	0.47	0.05	9.03

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
GSM rating	0.35	0.05	7.43
HCMB rating	0.34	0.51	0.67
HM rating	0.38	0.08	4.95
HT rating	0.04	0.05	0.81
IC rating	0.44	0.05	9.70
IM rating	0.15	0.30	0.49
IS rating	0.33	0.05	7.12
IT rating	0.23	0.07	3.42
JO rating	0.11	0.14	0.84
LI rating	-0.08	0.14	-0.55
LLE rating	0.20	0.33	0.61
MA rating	-0.16	0.21	-0.74
MCHA rating	0.61	0.39	1.57
MED rating	-0.09	0.29	-0.32
ML rating	-0.55	0.83	-0.66
MM rating	0.46	0.03	14.33
MMS rating	0.08	0.05	1.67
MN rating	0.13	0.09	1.47
MR rating	0.03	0.10	0.32
MS rating	-0.03	0.03	-0.95
MSS rating	0.30	0.07	4.14
MT rating	-0.27	0.09	-2.80
MU rating	-0.92	0.11	-8.69
NAV rating	0.04	0.38	0.09
NF rating	0.65	0.04	16.01
OM rating	0.40	0.32	1.23
OPCM rating	0.18	0.16	1.08
ORDN rating	0.19	0.35	0.55
OS rating	0.29	0.03	11.06
PC rating	0.09	0.11	0.81
PH rating	0.33	0.12	2.77
PM rating	0.33	0.54	0.60
PN rating	-0.30	0.06	-5.44
PR rating	-0.09	0.06	-1.35
QM rating	0.18	0.06	3.03
QMS rating	0.30	0.92	0.32
RM rating	0.49	0.03	17.84
RP rating	-0.28	0.10	-2.75

Table 5. Heckman model results (continued)

Variable	Coefficient	Standard error	Z
SEC rating	0.13	0.10	1.27
SH rating	0.12	0.06	2.05
SK rating	-0.37	0.05	-7.50
SKS rating	-0.37	0.12	-3.15
SM rating	0.17	0.06	2.96
SPE rating	0.76	0.06	13.86
SPSV rating	-0.04	0.29	-0.15
SS rating	0.08	0.04	1.84
ST1 rating	0.33	0.07	5.03
ST2 rating	0.27	0.05	5.31
ST3 rating	-0.20	0.10	-1.99
ST4 rating	0.23	0.05	5.02
ST5 rating	0.37	0.12	2.97
ST6 rating	0.23	0.48	0.47
ST7 rating	0.26	0.11	2.32
ST8 rating	0.01	0.14	0.06
ST9 rating	0.13	0.13	1.04
STG rating	0.29	0.04	6.85
STS rating	0.56	0.05	11.68
SW rating	0.26	0.11	2.36
TM rating	-0.07	0.07	-1.00
TMS rating	0.48	0.16	3.04
UT rating	0.26	0.10	2.52
YN rating	-0.40	0.04	-10.67
YNS rating	-0.36	0.11	-3.29
CTstar rating	0.10	0.04	2.54
Constant	-0.16	0.07	-2.33
Mills			
lambda	0.00	0.01	-0.16
rho	0.00		
sigma	0.46		
lambda	0.00	0.01	

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Appendix C: Regression models for NF Sailors

Table 6. NF reenlistment equation

Variable	Coefficient	Standard error	Z
Enlistment Bonus	-0.07	0.14	-0.50
Navy College Fund	-0.29	0.14	-2.08
NCF & EB	1.47	0.24	6.06
SRB	0.27	0.01	19.94
Age	0.02	0.02	1.09
Female	-0.24	0.11	-2.08
Black	-0.04	0.13	-0.33
Asian/Pacific Islander	-0.10	0.14	-0.72
Native American	0.33	0.15	2.24
Other ethnicity / Unknown	0.71	0.42	1.69
Hispanic	-0.20	0.10	-2.03
Married	0.30	0.21	1.42
Children	0.27	0.29	0.94
GED	-0.46	1.32	-0.35
Some College	-0.06	0.11	-0.60
Bachelor's Degree	-0.48	0.31	-1.57
Other education	-0.39	1.27	-0.31
AFQT	-0.01	0.00	-3.22
% College Attendance[a]	0.00	0.01	0.30
% Veterans	-0.11	0.01	-15.07
Median family income[b]	0.00	0.00	-3.99
E3 at decision	-1.46	0.19	-7.72
E5 at decision	-2.01	0.06	-33.65
E6 at decision	-3.55	0.17	-21.43
Married at decision	0.65	0.07	9.17
Children at decision	0.08	0.07	1.21
FY97 decision	4.02	1.02	3.95
FY98 decision	2.32	0.37	6.32
FY00 decision	-0.10	0.14	-0.75
FY01 decision	-0.69	0.12	-5.64

Table 6. NF reenlistment equation (continued)

Variable	Coefficient	Standard error	Z
FY02 decision	-0.96	0.13	-7.54
FY03 decision	-0.64	0.13	-4.99
FY04 decision	-1.37	0.14	-9.90
FY05 decision	-2.18	0.15	-14.04
FY06 decision	-3.58	0.21	-16.68
FY07 decision	-4.28	0.22	-19.84
Constant	6.27	0.66	9.50

a. % college is 0.0022785.
b. Family income is -0.0000121.

Table 7. NF MGIB Equation

Variable	Coefficient	Standard error	Z
Months since reenlistment decision	0.14	0.03	4.92
Months since reenlistment decision squared	0.00	0.00	-3.67
Enlistment Bonus	0.01	0.20	0.05
Navy College Fund	0.43	0.21	2.09
NCF & EB	0.03	1.33	0.03
Age	-0.08	0.03	-2.45
Female	0.50	0.17	2.98
Black	-0.04	0.21	-0.19
Asian / Pacific Islander	0.21	0.22	0.94
Native American	0.19	0.25	0.79
Other ethnicity / Unknown	-0.61	0.80	-0.76
Hispanic	0.32	0.15	2.09
Married	-0.10	0.34	-0.28
Children	-0.16	0.51	-0.32
Some College	0.16	0.15	1.07
Bachelor's Degree	-0.74	0.42	-1.78
AFQT	0.00	0.01	0.47
% College Attendance	0.01	0.01	0.93
% Veterans	0.00	0.01	0.28
Median family income	0.00	0.00	-1.84
E1 at decision	-1.24	1.24	-1.00
E2 at decision	0.83	1.12	0.74
E3 at decision	-0.31	0.26	-1.17
E5 at decision	-0.10	0.11	-0.87
E6 at decision	0.04	0.17	0.23
Married at decision	-0.39	0.11	-3.61
Children at decision	-0.23	0.11	-2.03
FY98 decision	0.75	0.88	0.85
FY00 decision	-0.73	0.41	-1.77
FY01 decision	-0.99	0.58	-1.71
FY02 decision	-0.87	0.71	-1.22
FY03 decision	-0.36	0.78	-0.46
FY04 decision	-0.38	0.83	-0.46
FY05 decision	-3.61	1.32	-2.72
Constant	-1.14	1.24	-0.92

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