Reduced Retirement Benefits: Should I Stay or Should I Go?*

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Abstract

We use data from a quasi-experiment in which retirement benefits were reduced by congressional legislation and later restored to estimate the effect of a change in future retirement benefits upon the decision of whether to remain in the U.S. military. We find that as a consequence of a 20-percent reduction in expected retirement benefits, members' likelihood of serving 20 years and qualifying for retirement benefits is reduced by between 2 percent and 3 percent.

1 Introduction

Retirement benefits and other forms of deferred compensation play an important role in affecting incentives for labor supply. By delaying part of a worker's compensation contingent upon employment at some future date, an employer can increase work effort and reduce turnover in the years prior to retirement. (Lazear 1990, Lazear and Moore 1988) This effect is more easily identifiable in defined benefit pension plans where, after a vesting date, employees become eligible to receive benefits, the amount of which are not directly tied to financial contributions to the pension plan.

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Members of the US Military are provided a defined benefit pension plan in which after a vesting date of 20 years of service, the member is eligible to receive upon leaving the military a lifetime benefit based on total years of service starting at half their final base pay. Lazear (1990) reasoned that such a "cliff vesting" system would cause turnover to decline through 20 years of service, at which point it would increase sharply. Lazear (1990) attributes this behavior to the increasing option value of working to maintain eligibility and receive future retirement benefits.

Studies in the retirement literature have relied upon changes in the option value of working as employees age.[1] The effect of retirement benefits on younger workers has remained largely unstudied. Small annual changes to the option value of work to maintain eligibility for a retirement plan in the distant future are an insufficient basis to identify effects on the behavior of young workers. In addition, provisions of pension systems are sometimes poorly understood by workers. (Luchak and Gunderson 2000) In 1986, Congressional action created a widely known 20-percent reduction in retirement benefits for new members of the military. Fortunately for our analysis, the Department of Defense (DOD) implemented this law in an experimental-like fashion. Cohorts of officers who first took their oaths of office between 1987 and 1990 contain members assigned to the former, more generous retirement plan and the new, somewhat less generous retirement plan, but facing otherwise identical opportunities in the civilian job market. This enables us to identify the causal effect on younger workers in their late twenties and early thirties from a 20-percent reduction in expected retirement benefits.

Due to institutional structures we explain below, entering officers lack the ability to select into the more generous pension plan. We find modest but highly significant reductions in the estimated probability of reaching the vesting date of the retirement system, between 2 and 3 percentage points. In contrast, Lazear and Moore (1988) find that a more modest 10 percent increase in the option value of retirement eligibility increases the probability of turnover for older workers by a much larger 22 percent. We provide a possible explanation for this apparent disparity in the magnitude of the reactions. Asch, Haider, and Zissimopoulos (2005) find that DOD civil service workers near retirement age delay their retirement probability by 4 percent for each $10,000 reduction in the

[1] See Asch, Haider, and Zissimopoulos (2005), Gustman and Steinmeier (2004), Coile and Gruber (2001), and Samwick (1998).

option value of retirement wealth. While somewhat analogous, older workers facing retirement from the labor force are more likely to need the increased option value in the near term; thus, we would expect changes to have an impact of greater magnitude as workers near retirement[2]

To the best of our knowledge, our paper is the first to study the effect of a large change in pension benefits on turnover in younger workers. We extend the military retirement literature by studying a large sample of officers as opposed to enlisted members of the military[3] and by implementing a survival analysis framework.

Our paper proceeds as follows: We review the military retirement system, how officers enter the military, describe our data, present the theoretical framework of our model, present our results, discuss, and conclude.

2 The US Military Retirement System

The Army and Air Force Vitalization Act of 1948 established the basic structure of the current military retirement system, which standardized the retirement system across all branches of the military. For all members who entered the service before September 1980, their projected military retirement benefit was 50 percent of their final pay[4] while on active duty, conditional upon vesting at 20 years of service.[5] For each year of additional service past 20, the benefit is increased by 2.5 percent. Retirement payments are indexed for inflation as measured by changes in the Consumer Price Index (CPI). For members who enter after September 1980 but before August 1, 1986, an

[2]Younger workers have more time to recover from a financial setback; all else equal, they should accept more risk in their portfolios;For older workers who assume expected risk commensurate with their time horizon, any reduction in retirement benefits can most effectively be offset with additional labor income

[3]Most papers in the military retirement literature focus on retirement decisions of enlisted members of the military. (Asch and Warner 1994, Asch, Johnson, and Warner 1998, Asch, Hosek, Mattock, and Panis 2008) The major exception, Ausink and Wise (1996), examines military pilots, all of whom are officers.

[4]Final pay is defined as taxable military compensation. Regular military compensation, which is most comparable to civilian salaries, includes allowances, which in some instances might be large, and tax benefits associated with these allowances (Office of the Actuary 2012). For instance, members receive allowances for housing and for subsistence; these allowances do not factor into retired pay calculations. From Office of the Actuary (2012), base pay represents about 69 percent of regular military compensation for all retirement eligible members and 67.3 percent for 20-year retirees; thus, a retiree at 20 years would receive about 33.7 percent of regular military compensation.

[5]The military retirement system includes individuals who served for at least 20 years on active duty and chose to retire, individuals who retired early due to disability, and individuals who served in the reserves and satisfied the reserve criteria for retirement, of which the biggest difference is that reservists must wait until they reach 60 years of age to begin drawing retirement.

average of the highest three years of pay is used as the base to determine retirement benefits.[6]

Members who first entered military service after August 1, 1986 were entitled to 40 percent of their highest three years of military pay at 20 years of service. For each year that a member stays past 20, they would earn an additional 3.5 percent versus the 2.5 percent under the previous plan. Thus, a member who stays 30 years under this latest plan, which we refer to as REDUX, would almost have the same retirement benefit as one who retired under the previous High Three retirement plan.[7] Of the 1.4M current military retirees,[8] more than half retire at 20 years of service (51.9 percent), 63 percent retire within the first two years of eligibility, and almost 73 percent retire within their first three years of eligibility. (Office of the Actuary 2012) Despite the relative comparability of retirement benefits at 30 years of service, this pattern of retirement at the earliest opportunity means that the provisions of REDUX substantially reduced expected retirement benefits, up to 20 percent. We summarize the features of REDUX and the plan that preceded it, High Three, in Table 1.

Beginning in Fiscal Year 2000, members who joined the military under the provisions of REDUX, as well as new members, must choose between the previous retirement system (High Three), or receive a taxable cash payment of $\$30,000$ and retire under REDUX. The overwhelming majority of officers have chosen High Three.[9]

3 Entering Military Service

The integrity of our research design to estimate the effect of REDUX on remaining in the military critically depends upon future officers being unable to affect which retirement plan they will receive. This is determined by the date at which an officer candidate commits to join the military, referred to as the Date of Initial Entry to Military Service, or DIEMS. Young women and men

[6] Save for a few exceptions, the highest three years is also the last three years of pay. We will refer to this system as "High Three".

[7] Under REDUX, members also received a 1 percentage point reduction in their cost of living increase until age 62. At age 62, there is a one-time catch-up in the retirement pay amount; for each year after age 62, a member covered under REDUX would continue to receive a cost of living increase as measured by the CPI less one percent.

[8] Excluding those who retired with disabilities and reservists, for whom different rules apply.

[9] For most officers, the expected rate of return on the after-tax value of the cash payment must be much greater than the long-term average rate of return on U.S. common stocks to equilibrate the net present value of both pension plans. This is before consideration of the 1-percent reduction in cost of living increases; inclusion of such makes the necessary return even greater.

can become officers through one of three commissioning sources; graduation from a military service academy, graduating from a civilian university while participating in the Reserve Officer Training Corps (ROTC), and the Officer Training School (OTS) for those who have already earned an undergraduate degree. Each commissioning source has different rules establishing a DIEMS date. Because reduced retirement benefits through REDUX were phased in gradually over four years for officers commissioning through ROTC as opposed to sharp implementation date cutoffs in the other commissioning sources, we restrict our sample to officers who commissioned through ROTC.[10]

The length of time which elapses between the initial commitment to become an officer (represented by the DIEMS Date) and the date when an officer candidate takes her/his oath of office (Commissioning Date) varies substantially. ROTC scholarship applications are due at the beginning of December in the year prior to the anticipated college start date. Scholarship award winners are given a DIEMS date associated with the date of their scholarship contract (acceptance of the scholarship).[11] For ROTC cadets who are not awarded a scholarship, their DIEMS date is determined by the first day of the fall semester of the year in which they contract into the senior ROTC program. Because of this structure, it is not possible for ROTC graduates to accelerate their DIEMS date to enter the High Three retirement system instead of REDUX, and as a consequence, self-selection of the retirement system was not feasible for the officers included in our data set.

As a consequence of this, ROTC officers gradually phased into REDUX depending upon when they received ROTC scholarships or signed their contract. This is illustrated in Figure 1. Beginning with officers commissioned in 1987, some proportion of ROTC officers are covered by each retirement plan with the proportion covered by REDUX increasing until 1991, when all officers were covered by REDUX.

4 Data

For this analysis, we use data provided by the Defense Manpower Data Center containing basic demographic information and military rank, by year, for officers from each branch of the military

[10]The sharp implementation date cutoffs for service academies and OTS could be conducive to performing a difference-in-difference analysis. However, growth rates across commissioning sources are not sufficiently similar prior to the introduction of REDUX to reliably implement this methodology.

[11]Scholarships can be awarded for two, three, and four years.

commissioning through ROTC whose DIEMS date is within five years of the implementation of REDUX, which is August 1, 1986. Our data consists of ROTC officers who entered active duty between 1987 and 1990. We choose to study officers in contrast to enlisted members of the military due to the greater freedom officers have to exit the military after fulfilling their initial service obligations and the higher proportion of officers who receive retirement benefits than enlisted military members. According to a recent study of military compensation, 40 percent of officers serve at least 20 years and qualify for military retirement benefits, while only 10 percent of enlisted military do so. (Defense Advisory Committee on Military Compensation 2006) Warner (2008) finds similar retention rates for enlisted, but lower rates (approximately 20 percent) for officers. Enlisted members must sign enlistment contracts that obligate them to serve a fixed length of time in the military, usually 3 or 4 years. They are free to leave the military only when their enlistment contract has expired, except under extraordinary circumstances. In contrast, new officers incur an initial service obligation of 4 years and possibly further obligations in return for educational benefits or completing pilot training. Similarly, we focus solely on officers who serve on active duty only, without serving time in the Reserves, because of the differences in the retirement plans for members who retire from the Reserves. Once these obligations are fulfilled, an officer is free to leave military service. If no longer under obligation, a decision to remain in the military can be interpreted as a revelation of preferences. We therefore build a data set of officers who are under no obligation for continued military service.

To further isolate only officers that are under no service obligation, we omit pilots, lawyers, and medical professionals from our data set. Each incurs a separate service obligation for their additional training and education. For example, in the period covered by our data set, Navy pilots incurred an additional 8 years of service obligation and Air Force pilots incurred 10 years. Also during the time period of our analysis, pilots who had fulfilled their initial service obligation could choose an additional n-year service commitment in return for a $n * \$25,000$ cash bonus. Lawyers and medical professionals have comparable service commitments and retention bonuses. It is very unlikely that reduced retirement benefits affects this subset of officers in the same manner as officers from career fields not subject to large bonuses.

Table 2 summarizes basic demographic characteristics by year for our sample. We note that

the proportion of officers who leave military service before the repeal of REDUX in 1999 grows rapidly between 1987 and 1990 as REDUX is phased in. The second line of Table 2, labeled *Reduced Retirement*, reports the proportion of our sample by year which is affected by reduced retirement benefits through REDUX. Demographic characteristics are broadly similar by year, with the exception of the sample comprising a somewhat larger number of females through time. We note that the differing proportion of each branch of military service by year is determined administratively, and not through choices of individual service members.

In Figure 2, we illustrate the proportion of officers who leave the military, or separate, before REDUX was repealed in 1999, by year of commissioning. In each of the latter three years represented in the figure, a higher proportion of officers affected by REDUX left the military than those under the more generous High Three retirement plan. We note that a very small proportion of officers were under REDUX in 1987.

5 Model

To estimate the effect of reduced retirement benefits on continued service in the military, we will estimate a series of models with a common effect of REDUX from 1987-1990 but allow for different average separation rates by year, with several levels of statistical controls.

To implement this research design, we use four estimation techniques, each with strengths and weaknesses. First, we implement Ordinary Least Squares (OLS) with a dependent variable of whether an officer left military service before REDUX was repealed in 1999. The strength of this estimation technique is ease of interpretation and well-known statistical properties. One data point per officer of whether they exited military service before the repeal of REDUX precludes the use of potential explanatory variables that change over time, such as age or marital status, and does not account for when within the time period an officer left military service. To allow for annual updates of whether an officer remains in the military, we estimate a pooled OLS model. However, this estimation technique attributes any heterogeneity between officers to the included explanatory variables.[12] It is possible in principle to estimate the effect of reduced retirement benefits using

[12] A fixed effects model is not feasible since the treatment status of an individual officer does not change and is therefore perfectly collinear with the fixed effect.

a random effects model. We estimate our two research designs using random effects, but caution that the estimated coefficients are likely inconsistent.[13]

Our preferred estimation technique is a duration model in which the probability of continuation in military service is conditional upon service to the current time period. Duration models allow the inclusion of officers with censored observations. However, the interpretation of coefficient magnitudes is less straightforward.

This model has been used in the economics literature to model the duration of employment to retirement (Hausman and Wise 1985), the duration of spells of unemployment (Lancaster 1979), and the effects of tax cuts on entrepreneurial longevity. (Gurley-Calvez and Bruce 2008) Duration models are broadly classified as either proportional hazards, where each member's individual hazard function (probability of experiencing an event through time) is a vertical shift of a common non-parametric hazard function, or an accelerated failure time specification, in which the hazard function is parametrically determined. Our data rejected the proportional hazards hypothesis for the overall model, leading us to choose an accelerated failure time specification.[14] Using the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) to distinguish between statistical distributions which support accelerated failure time, we selected the Weibull distribution.[15]

We estimate

$$Y_{it} = \delta D_i^T + \beta_1 + \beta_2 D_i^{88} + \beta_3 D_i^{89} + \beta_4 D_i^{90} + \beta_5 D_i^A + \beta_6 D_i^M + \beta_7 D_i^N + \epsilon_{it} \tag{1}$$

where Y_{it} represents whether officer i exited the military while REDUX was in effect (Specification 1), whether officer i exited the military during time period t (Specifications 2 and 3), or the natural log of cumulative time at risk for officer i (Specification 4), D_i^T is a dummy variable representing whether officer i is in the treatment group and facing reduced retirement benefits, D_i^{88} through D_i^{90} indicate the year in which officer i was commissioned, D_i^A, D_i^M, and D_i^N represent whether officer i is a member of the Army, Marines, or Navy respectively, and ϵ_i is a stochastic error term.

[13] For consistency, the random effect must be uncorrelated with all explanatory variables used in the model.

[14] While not our final specification, for diagnostic purposes, we originally fitted the model as a Cox proportional hazards model. It is this model that fails the proportional hazards specification tests. Results are available from the authors upon request.

[15] Results are available upon request.

We do not include explanatory variables such as the estimated value of military retirement, possible civilian wages if a member left service, or possible civilian retirement plans. Within this framework, the estimated values of military retirement, average civilian wages, and average civilian retirement values will be identical for treatment and control groups from the same officer year cohort, and provide no additional explanatory value.

6 Results

Table 3 presents basic OLS specifications with the dependent variable representing whether an officer left military service before the repeal of REDUX in 1999. Specification (1) includes only year fixed effects and branch of military service fixed effects. In this most basic specification, the REDUX reduced retirement benefits cause a 2.3 percent increase in the probability that an officer leaves military service before reaching retirement eligibility, at a 5 percent level of significance. Specification (2) adds all available demographic controls; marital status, gender, and racial minority and ethnicity status. Since the data used for these specifications have one observation per officer, we represent marital status as a dummy variable representing whether the officer was married at any time during the period of time represented by this sample. For this and the remaining specifications, the omitted demographic category is a Caucasian male, never married, who is a member of the Air Force. In adding demographic controls, we find a nearly identical 2.2 percent increase in the probability of leaving military service due to reduced retirement benefits. In this specification, officers who were or had been married are 8.6 percent less likely to leave military service than the omitted category of never married. Gender does not appear to affect the probability of leaving military service. We note with interest that African American officers are 5.3 percent less likely to leave military service than Caucasian officers, significant at the 1 percent level. And Hispanic officers are 27.8 percent more likely to leave military service than the omitted category of Caucasian officers, again significant at the 1 percent level. In Specification (3), we add controls for the age of commissioning, or at what age did the subject first became an officer. The effect of REDUX is a nearly identical 2.4 percent, but now significant at the 1 percent level. Estimated coefficients for the remaining control variables are comparable.

Table 4 presents parameter estimates from pooled OLS specifications with a dependent variable of whether an officer left military service in the current year. Estimated coefficients on the first row should be interpreted as the annual increase in the probability of leaving military service due to REDUX reduced retirement benefits. The parameter of interest in each specification is 0.3 percentage points, significant at the 5 percent level. Members of the treatment group (REDUX) serve on average 8.8 years. This implies a cumulative $0.3 \times 8.8 = 2.64$ percent cumulative increase in the probability of leaving the military prior to the repeal of REDUX, which is nearly identical to the effects reported in Table 3. By using panel data methods, we are now able to add marital status in each year (Specification 2) and *Years to Retirement Eligibility* as a statistical control (Specification 4). Across Specifications (2) through (4), African American officers remain less likely to leave military service, and Hispanic officers considerably more likely to leave military service. Both marital status and gender become insignificant as control variables as *Years to Retirement Eligibility* is added.

Table 5 presents results from random effects models. As in the pooled OLS specifiications, the estimated coefficient of interest is constant across all specifications, but higher at 0.4 percent annually. This implies a cumulative $0.4 \times 8.8 = 3.52$ percent cumulative increase in the probability of leaving the military prior to the repeal of REDUX. We use the same four sets of specifications as in Table 4. Estimating with random effects, married and divorced officers are more likely to leave military service than never married officers, and female officers more likely to leave than male officers. As before, African American officers are less likely to leave and Hispanic officers are more likely to leave.

We present duration models in Table 6, our preferred specifications. In Specifications (1), (2), and (3), reduced retirement benefits from REDUX have a negative effect on duration into the next year, significant at the 1 percent level. When adding years to retirement eligibility control variables in Specification (4), both the magnitude and significance of the effect decrease. While duration models allow superior handling of incomplete panel observations and a theoretically appealing specification of each time period as a probability of continued duration given duration into the present time period, we acknowledge the difficulty of interpreting the magnitude of estimated coefficients. In Figure 3, we present a forecasted effect of reduced retirement benefits over the

20-year period prior to vesting. The left panel is calculated from Specification (1) and the right panel from Specification (3). In both panels, the forecasted effect of REDUX on the probability of remaining in the military 20 years and reaching retirement vesting appears to be between 2 and 3 percent. In the duration models, we also note that, in addition to REDUX, the only significant remaining explanatory variable is whether the officer is African American or Hispanic. As before, African American officers are more likely to continue into the following time period (less likely to leave military service) and Hispanic officers are less likely to continue (more likely to leave).

In Table 7, we estimate the effect of REDUX on demographic subsamples for OLS models on whether an officer leaves military service before REDUX is repealed in 1999. These are variations of the specifications reported in Table 3. We estimate both a basic specification with year and branch of military fixed effects only and a specification with all control variables including age at commissioning and years to retirement eligibility, where feasible. In the first line, we estimate by gender. Reduced retirement benefits cause both male and female officers to be more likely to leave military service. In both the basic specifications and with full controls, the effect on female officers is 3 to 4 times as large as it is for male officers. We find that Caucasian officers are 3.1 percent less likely to remain in military service as a result of reduced retirement benefits at a 1 percent level of significance, but non-Caucasian officers as a group are unaffected by REDUX. We find that officers who are or have been married are unresponsive to reduced retirement benefits, but never married officers are highly responsive; 6.2 and 6.6 percent more likely to leave military service as a result of REDUX, significant at the 1 percent level. Finally, we note with interest the effect of age. Officers who enter military service before 26 years of age are less likely (4.5 percent and 4.7 percent) to remain in military service at a 1 percent level of significance. But officers who are 26 or over at commissioning are unaffected by REDUX.

7 Discussion

Across 4 specifications and 4 estimation methodologies, we uniformly find that reduced retirement benefits cause officers to more likely leave military service. A careful analysis of why some demographic subgroups are more responsive to financial incentives than their complement group is

beyond the scope of this paper. Unresponsiveness to financial incentives can be indicative of lack of close substitutes and suitable alternatives in the civilian labor market, or of a firm commitment to be an officer apart from financial incentiives. Our administrative data cannot give insight as to which this might be. We find the difference in responsiveness based on age at commissioning to be particularly intriguing and worthy of future research. If officers value future promised retirement benefits with geometric discounting, officers closer to retirement age should value retirement benefits more highly than younger officers due to the number of periods the benefits are discounted. Yet in Table 7, we find the opposite. We offer a possible explanation based on the change in generosity of expected retirement benefits in light of the overall generosity of even the somewhat diminished retirement benefits.

Given positive employee turnover under both retirement systems, it would seem that an officer under the High Three retirement system with a given statistical profile who is indifferent between continuing military service and exiting should surely exit if she or he were instead under REDUX. Yet given the generosity of REDUX retirement provisions relative to those offered in the civilian labor market, the choice to exit the military and forgo a generous pension is not so simply explained. Consider a member of the military who has fulfilled his or her initial four-year service commitment and now faces the choice of whether to continue in service or exit. At this time, a member who falls under the REDUX retirement system is faced with the present value of an expected retirement benefit that is approximately $64,000 less than it would have been under High Three[16] but is still expected to receive a pension with a present value of $255,000 in the fourth year of service. Monthly savings of almost $2,000 would be needed for the next 16 years to accumulate a lump sum equal to the present value of the REDUX pension upon retirement after 20 years of service.[17]

In the late 1990s, as part of a drawdown in the size of the military, officers were given a choice of cash payments or annuities to leave the military. An overwhelming majority chose cash. Warner and Pleeter (2001) explain the overwhelming choice of cash payments over annuities with either

[16] We calculate 2014 dollars. We assume a 28-year old male officer in 1994 who has just been promoted to the rank of Captain (O-3), a 5-percent discount rate, and a 1-percent real cost of living increase for both plans. We also adjust for the probability of survival into each age. As a simplifying assumption, we ignore the 1 percentage point reduction in the cost-of-living increase that members under REDUX will receive

[17] Assuming instead a discount rate of 3%, the PV of the difference between REDUX and High Three pensions at four years of service is $120,000. The present value of the REDUX pension at four years of service is $480,000, and the necessary monthly savings to accumulate a comparable lump sum is $2,700.

extraordinarily large discount rates (17.5-19.8%), or time inconsistent preferences. Labison (1997) notes that an individual with time inconsistent (hyperbolic) preferences can make a long-term decision that is guided by a lower discount rate while making a short-term decision guided by a relatively high discount rate. For an individual with such preferences, a small change in current compensation can dominate large sums in the distant future, yet changes in the distant future with relatively small impact on present value are deemed important. The behavior of officers in aggregate and younger officers in particular is consistent with the findings of Warner and Pleeter (2001) and Labison (1997).

8 Conclusion

We examine data from a quasi-experiment in which Congressional action reduced pension benefits of new members of the US military by up to 20 percent. We find that as a result of this reduction in expected benefits, these employees in their late twenties and early thirties were between 2 and 3 percent less likely to serve 20 years and qualify to receive retirement benefits. The behavior we observe is consistent with the large personal discount rates estimated by Warner and Pleeter (2001) or hyperbolic discounting. Although younger employees do respond to changes in pension benefits, they are not as responsive as previous studies have found older workers to be. Our results have important implications to the likely effectiveness of retaining younger workers with delayed compensation.

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Figure 1: ROTC Graduating Classes by Retirement Plan

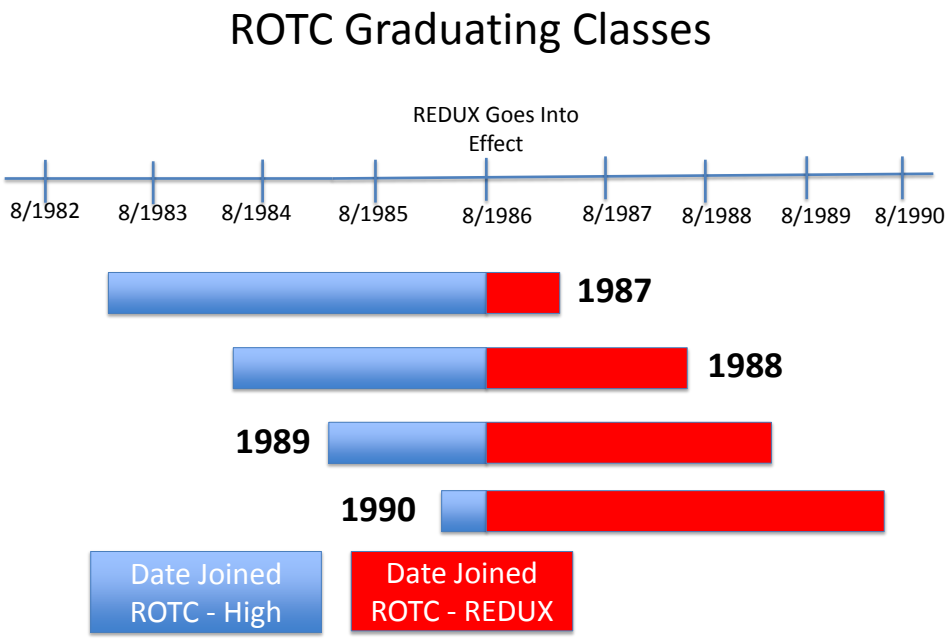


Figure 2: Proportion of Officers Separating Before 10 Years of Service

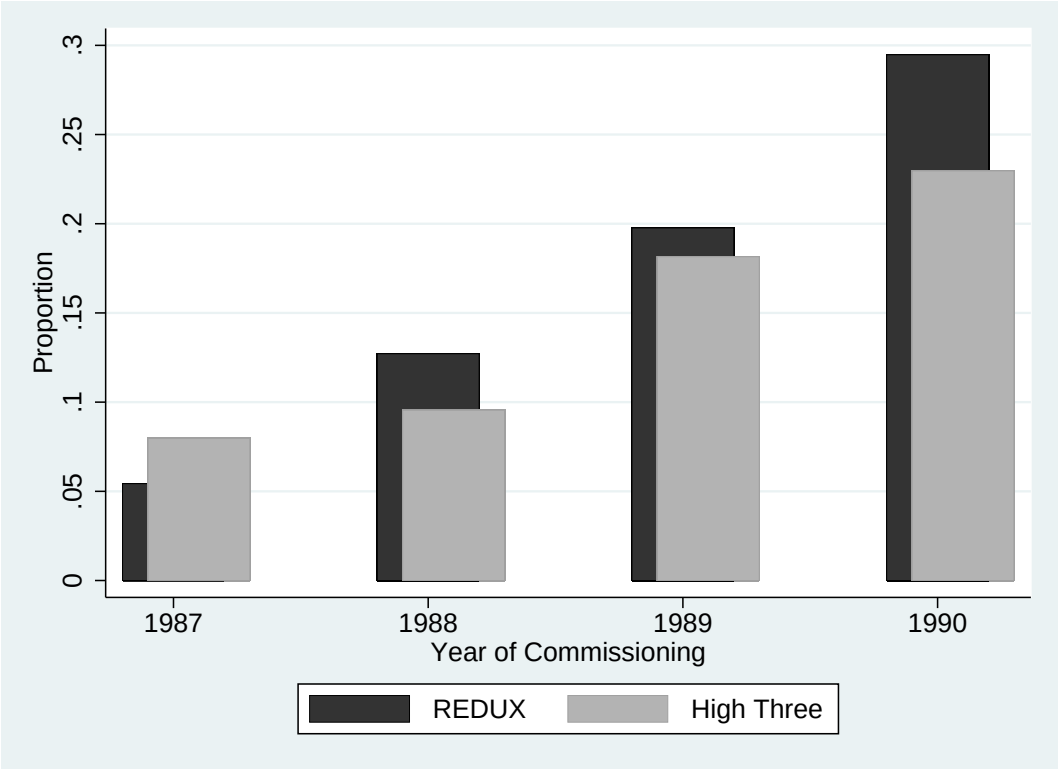
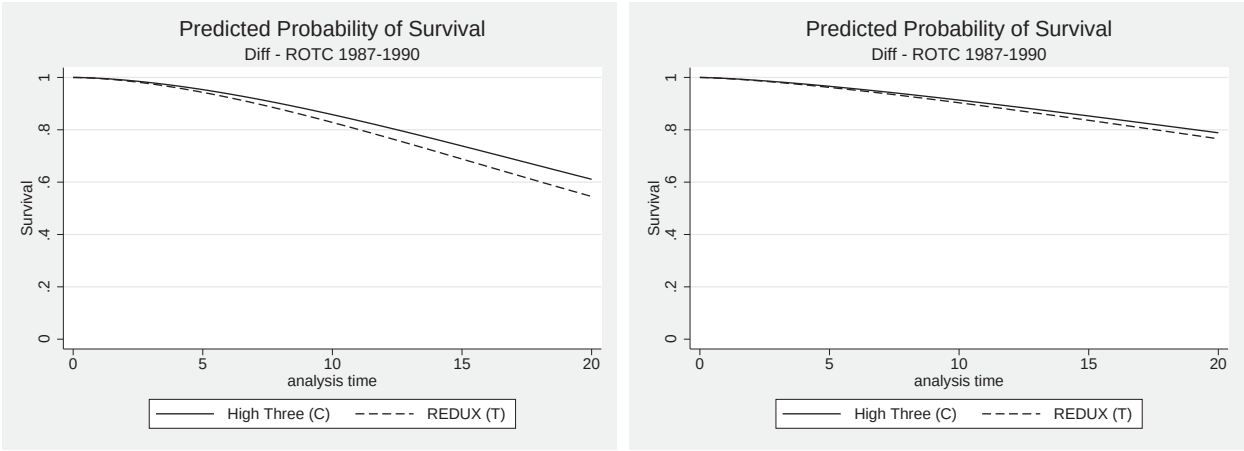


Figure 3: Effect of REDUX on the Probability of Reaching Retirement Eligibility



Notes: The charts represent estimated marginal effects using Specifications (1) and (3). Forecast is computed for a ROTC Air Force, never married, male, and Caucasian officer from the graduating cohort of 1987.

Table 1: Comparison of Two Most Prevalent Retirement Plans

	High Three	**REDUX**
Base Pay Amount	Average base pay in highest 36 months excluding bonuses	Average base in highest 36 months excluding bonuses
Percent of Base Pay Received in Retirement	$0.5 + 0.025 \times (S - 20)$	Age < 62: $0.4 + 0.035 \times (S - 20)$ Age > 62: $0.5 + 0.025 \times (S - 20)$
Cost-of-living Adjustment	Base Pay Amount Increases with CPI	Age < 62: Base Pay Increases by $CPI - 1$ Age $= 62$: Base Pay Amount set to High Three Age > 62: Adj. Base Pay Increases by $CPI - 1$

Table adapted from Jennings and Riechenstein (2001) with permission

Table 2: Summary Statistics

VARIABLES	(1) 1987 mean (sd)	(2) 1988 mean (sd)	(3) 1989 mean (sd)	(4) 1990 mean (sd)
Leave Service Before Repeal	0.0754	0.107	0.190	0.280
	(0.264)	(0.309)	(0.393)	(0.449)
Reduced Retirement	0.168	0.360	0.552	0.780
	(0.374)	(0.480)	(0.497)	(0.415)
Female	0.120	0.135	0.164	0.155
	(0.325)	(0.342)	(0.370)	(0.362)
Married	0.546	0.519	0.499	0.507
	(0.498)	(0.500)	(0.500)	(0.500)
Asian	0.0259	0.0285	0.0352	0.0383
	(0.159)	(0.166)	(0.184)	(0.192)
African American	0.110	0.110	0.0938	0.0922
	(0.313)	(0.314)	(0.292)	(0.289)
Hispanic	0.0564	0.0636	0.0531	0.0582
	(0.231)	(0.244)	(0.224)	(0.234)
Native American	0.00685	0.00407	0.00327	0.00236
	(0.0825)	(0.0637)	(0.0571)	(0.0486)
Age at Commissioning	26.60	26.51	26.43	26.49
	(1.985)	(1.981)	(1.962)	(2.342)
Under 26 at Commissioning	0.248	0.249	0.297	0.354
	(0.432)	(0.433)	(0.457)	(0.478)
Years to Retirement Eligibility	15.97	15.96	15.98	15.98
	(0.298)	(0.347)	(0.236)	(0.229)
Army	0.433	0.353	0.275	0.309
	(0.496)	(0.478)	(0.447)	(0.462)
Air Force	0.303	0.399	0.406	0.230
	(0.460)	(0.490)	(0.491)	(0.421)
Marines	0.0251	0.0249	0.0207	0.0199
	(0.157)	(0.156)	(0.142)	(0.140)
Navy	0.239	0.223	0.299	0.442
	(0.427)	(0.416)	(0.458)	(0.497)
Observations	1,313	1,965	2,752	2,115

Table 3: OLS on Service Through 1999

VARIABLES	(1) Basic	(2) Demo	(3) Initial Age
Reduced Retirement	0.023*	0.022*	0.024**
	(0.009)	(0.009)	(0.009)
Ever Married		-0.086**	-0.083**
		(0.011)	(0.011)
Female		0.009	0.008
		(0.012)	(0.012)
Asian		-0.013	-0.012
		(0.022)	(0.023)
African American		-0.053**	-0.049**
		(0.010)	(0.010)
Hispanic		0.278**	0.287**
		(0.023)	(0.023)
Native American		-0.027	-0.028
		(0.056)	(0.055)
Observations	8,145	8,145	8,145
R^2	0.119	0.159	0.167

The dependent variable is a single observation for each officer of whether they served through 1999 and the repeal of REDUX. Omitted demographic category in Specifications 2, 3, and 4 is Air Force, never married, male, and Caucasian. Robust standard errors in parenthesis. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table 4: Pooled OLS on Annual Service Through 1999

VARIABLES	(1) Basic	(2) Demo	(3) Initial Age	(4) Years to Elig
Reduced Retirement	0.003*	0.003*	0.003*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Married		0.003*	0.004**	0.002
		(0.001)	(0.001)	(0.001)
Divorced		0.008+	0.009*	0.006
		(0.004)	(0.004)	(0.004)
Female		0.003+	0.003+	0.003
		(0.002)	(0.002)	(0.002)
Asian		-0.001	-0.001	-0.001
		(0.004)	(0.004)	(0.004)
African American		-0.008**	-0.007**	-0.007**
		(0.002)	(0.002)	(0.002)
Hispanic		0.040**	0.042**	0.042**
		(0.004)	(0.004)	(0.004)
Native American		-0.004	-0.004	-0.004
		(0.008)	(0.008)	(0.008)
Observations	55,283	55,283	55,283	55,283
R^2	0.019	0.023	0.024	0.035

The dependent variable is whether officer i left military service in year t. Omitted demographic category in Specifications 2, 3, and 4 is Air Force, never married, male, and Caucasian. Standard errors in parenthesis are clustered at the officer level. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table 5: Random Effects on Annual Service Through 1999

VARIABLES	(1) Basic	(2) Demo	(3) Initial Age	(4) Years to Elig
Reduced Retirement	0.004*	0.004*	0.004**	0.004*
	(0.002)	(0.002)	(0.002)	(0.002)
Married		0.013**	0.013**	0.007**
		(0.002)	(0.002)	(0.002)
Divorced		0.020**	0.020**	0.012*
		(0.005)	(0.005)	(0.005)
Female		0.005*	0.004*	0.004+
		(0.002)	(0.002)	(0.002)
Asian		0.000	0.000	-0.000
		(0.004)	(0.004)	(0.004)
African American		-0.010**	-0.009**	-0.009**
		(0.002)	(0.002)	(0.002)
Hispanic		0.039**	0.041**	0.041**
		(0.004)	(0.004)	(0.004)
Native American		-0.006	-0.006	-0.005
		(0.009)	(0.009)	(0.009)
Observations	55,283	55,283	55,283	55,283
Number of key	8,145	8,145	8,145	8,145
r2_o	0.0190	0.0224	0.0233	0.0344

The dependent variable is whether officer i left military service in year t. Omitted demographic category in Specifications 2, 3, and 4 is Air Force, never married, male, and Caucasian. Standard errors in parenthesis are clustered at the officer level. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table 6: Duration Model on Annual Service Through 1999

VARIABLES	(1) Basic	(2) Demo	(3) Initial Age	(4) Years to Elig
Reduced Retirement	-0.123**	-0.114**	-0.115**	-0.084+
	(0.038)	(0.037)	(0.037)	(0.049)
Married		0.045	0.028	0.074
		(0.035)	(0.035)	(0.047)
Divorced		-0.101	-0.122	-0.115
		(0.125)	(0.125)	(0.159)
Female		-0.057	-0.059	-0.084
		(0.042)	(0.042)	(0.056)
Asian		0.025	0.018	0.019
		(0.090)	(0.090)	(0.117)
African American		0.370**	0.370**	0.487**
		(0.084)	(0.084)	(0.106)
Hispanic		-0.589**	-0.614**	-0.775**
		(0.045)	(0.046)	(0.064)
Native American		0.062	0.07	0.033
		(0.288)	(0.285)	(0.382)
Observations	58,018	58,018	58,018	58,018
Officers	9,086	9,086	9,086	9,086
aux_p	1.685	1.708	1.718	1.393
$\ln(L)$	-3960	-3872	-3841	-3438
χ^2	845.6	1028	1056	2580

The dependent variable is whether officer i continued in military service in year t. Omitted demographic category in Specifications 2, 3, and 4 is Air Force, never married, male, and Caucasian. Standard errors in parenthesis are clustered at the officer level. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table 7: Reduced Retirement Benefits by Subsamples

	Min Controls		Full Controls	
SUBSAMPLE	Yes	No	Yes	No
Female	0.058*	0.016+	0.057*	0.018*
	(0.027)	(0.009)	(0.027)	(0.009)
	1,201	6,944	1,201	6,944
Caucasian	0.031**	-0.020	0.031**	-0.021
	(0.010)	(0.020)	(0.010)	(0.020)
	6,431	1,714	6,431	1,714
Ever Married	0.011	0.062**	0.012	0.066**
	(0.009)	(0.027)	(0.009)	(0.022)
	4,181	3.964	4,181	3,964
Under 26 at Commissioning	0.045**	0.013	0.042**	0.013
	(0.016)	(0.011)	(0.016)	(0.010)
	2,379	5,766	2,379	5,766

Each cell represents a separate OLS regression of whether the officer left military service while REDUX was in effect on reduced retirement, year, and service branch controls. The estimated coefficient on reduced retirement is reported, the robust standard error in parentneses, and the sample size below. Basic regression model controling only for branch of military in columns 1 and 2, remaining demographic controls including initial age and years to retirement eligibility included in columns 3 and 4. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.