NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

PENSIONS AND INTEMPORAL CHOICE: EVIDENCE FROM THE U.S. MILITARY

by

Jesse M. Cunha and Amilcar A. Menichini

February, 2014

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)* 19-02-2014	2. REPORT TYPE Technical Report	3. DATES COVERED *(From-To)* 01-06-2012 to 01-01-2014

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Pensions and Intertemporal Choice: Evidence from the U.S. Military	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)	5d. PROJECT NUMBER
Cunha, Jesse M. Menichini, Amilcar A.	5e. TASK NUMBER
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
Graduate School of Business and Public Policy Naval Postgraduate School Monterey, CA 93943	NPS-GSBPP-14-001

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
We study a choice made by over 20,000 U.S. military personnel annually between the High-3 and Redux retirement plans. Compared to High-3, Redux offers a $30,000 current lump sum payment in exchange for lower future annuity payments. Despite break-even discount rates between 10% and 25%, about 40% of individuals chose Redux. The likelihood of choosing Redux is decreasing with the break-even discount rate and is related to individual demographics. The implied personal discount rates from this choice are around 9.2%, much lower than found previously. Offering this choice has already saved the government over $2 billion in future retirement payments.

15. SUBJECT TERMS
retirement; pension; intertemporal choice, military

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON Jesse Cunha
a. REPORT	b. ABSTRACT	c. THIS PAGE	UU	33	
Unclassified	Unclassified	Unclassified			19b. TELEPHONE NUMBER *(include area code)* 650-492-0381

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

THIS PAGE INTENTIONALLY LEFT BLANK

NAVAL POSTGRADUATE SCHOOL
Monterey, California 93943-5000

Ronald A. Route
President

Douglas A. Hensler
Provost

The report entitled *"Pensions and Intertemporal Choice: Evidence from the U.S. Military"* was prepared for the Naval Postgraduate School.

Further distribution of all or part of this report is authorized.

This report was prepared by:

Jesse M. Cunha
Assistant Professor

Amilcar A. Menichini
Assistant Professor

Reviewed by:

Released by:

William Gates
Dean of Graduate School
of Business and Public Policy

Jeffrey D. Paduan
Dean of Research

THIS PAGE INTENTIONALLY LEFT BLANK

Pensions and Intertemporal Choice: Evidence from the U.S. Military[*]

Jesse M. Cunha

Naval Postgraduate School

and UC Santa Cruz

Amilcar A. Menichini

Naval Postgraduate School

February 19, 2014

Abstract

We study a choice made by over 20,000 U.S. military personnel annually between the High-3 and Redux retirement plans. Compared to High-3, Redux offers a $30,000 current lump sum payment in exchange for lower future annuity payments. Despite break-even discount rates between 10% and 25%, about 40% of individuals chose Redux. The likelihood of choosing Redux is decreasing with the break-even discount rate and is related to individual demographics. The implied personal discount rates from this choice are around 9.2%, much lower than found previously. Offering this choice has already saved the government over $2 billion in future retirement payments.

JEL Codes: H55; D91; H56

Keywords: retirement; pension; intertemporal choice; military

1 Introduction

We study a real retirement choice made by members of the U.S. military which involves large sums of money. Individuals retiring prior to 1986 had no choice concerning their retirement: if they served for 20 years, they would receive a generous defined benefit annuity referred to as High-3. However, the costs of this system have been large and are growing (Defense Business Board, 2011). For example, military retirement payments in FY 2012 were \$52.2 billion and are expected to rise to \$116.9 billion by 2035 (Office of the Actuary, 2013). In response to these rising costs, the National Defense Authorization Act of 2000 allowed members to make a choice between the High-3 plan and the Redux plan. Under Redux, service members receive a \$30,000 lump sum payment in exchange for future payments that are lower than those under High-3. The different structure of these retirement plans yields large differences in the present value of retirement payments. For instance, with a discount rate of 5 percent per year, the present value of High-3 over Redux for a representative officer can easily exceed \$110,000, while it can be more than \$60,000 for a representative enlisted service member.

Is the choice of Redux optimal from the individual's point of view? In this paper, we provide the first evidence on who takes Redux over High-3, which allows us to shed some light on whether optimal decisions are being made. We use personnel data from the military on close to 80,000 enlisted personnel and 9,000 officers who made the Redux/High-3 choice since 2001 and, under minimal assumptions, we calculate after-tax break-even discount rates (the discount rate that equates the present value of both streams of payments and which can be considered as a proxy for the disadvantage of Redux) between roughly 10 and 25 percent, with an overall mean of 13 percent. Despite these high break-even rates, we find that more than 40% of military personnel have chosen Redux.

The likelihood of choosing Redux, however, is decreasing with the break-even discount rate, which is consistent with service members making informed decisions. Furthermore, the probability of choosing Redux is negatively related to being female, being an officer, age, educational attainment, being single. Selecting Redux is positively related to being Black, the number of dependents, and being divorced. These results are in line with previous findings in the literature, in particular the 2001 study by Warner and Pleeter analyzing the choices between an annuity and a lump-sum payment of 66,000 service members eligible for early separation from military service.

Understanding the factors affecting personal financial choices has important implications for public policy, such as in the design of retention policies and retirement plans. A large benefit of our study is that it involves real (as opposed to hypothetical) choices made

by military personnel over substantial amounts of money. Simple calculations show that introducing the possibility to choose Redux has saved the U.S. Department of Defense (DoD) more than $2 billion ($5 billion) in retirement payments assuming a yearly interest rate of 5% (2%), at the same time that it has allowed service members to choose income streams that better fit their personal financial tastes. Furthermore, the DoD is presently studying different alternatives to overhaul the current retirement system, and any change that involves individual choice can be informed by our results (Defense Business Board, 2011).

It is also important to note that the demographic make-up of the military is broadly comparable to that of both the broad public sector and the private sector, and so our findings may be useful in the formulation of savings and retirement plans for those populations. For example, the Redux versus High-3 decision is of a simliar nature to the choice of when to claim Social Security payments (e.g., Coile et al. (2002)), or whether or not to purchase an annuity (e.g., Finkelstein and Poterba (2004)).

We close our paper by using the retirement choice to estimate personal discount rates (that is, the rate at which individuals are willing to exchange future for current consumption). By using a model in the spirit of Warner and Pleeter (2001), we find that the military force as a whole exhibits personal discount rates around 9 percent (10.05 percent for enlisted members and 6.49 percent for officers); however, these results are lower than the discount rates reported in the literature. For example, Warner and Pleeter (2001) find that most military personnel exhibited personal discount rates of 18 percent or more, and Harrison et al. (2002) perform a field experiment in Denmark involving real economic commitments and find an overall personal discount rate of 28.1 percent. The low personal discount rates that we find, broadly comparable with market interest rates, lend support to the idea that individuals are not making gross mistakes by choosing Redux over High-3.

The remainder of our paper proceeds as follows: Section 2 details the Redux and High-3 plans and the differences between them, while Section 3 discusses the decision making process the individual faces. Section 4 summarizes the data and our empirical sample. The estimated relationships between the retirement choice and personal characteristics are presented in Section 5, while Section 6 discusses the results on estimated personal discount rates. Section 7 concludes.

2 Retirement Choice in the U.S. Military

2.1 The High-3 and Redux retirement plans

The current military retirement system is a defined benefit plan where service members do not make any contributions. However, eligibility for the retirement pension (i.e., vesting) occurs only after 20 years of service (YOS); if a service member leaves before 20 YOS, they receive no pension.[1] Service members who joined the military after July 31, 1986 are required to choose between two retirement plans, High-3 and Redux, when they reach 15 YOS.[2]

Under the High-3 formula, retirement payments are a function of the number of YOS and the average of the highest 36 months of basic pay during the individual's service.[3,4] Specifically, High-3 retirees receive 2.5 percent of this "high-3" basic pay for each year of service, adjusted for inflation with the Consumer Price Index (CPI). For example, a retiree with 20 YOS receives 50 percent of her "high-3" basic pay.

The Redux formula is similar to High-3, except that choosing Redux entitles the service member to a lump sum payment of $30,000 called the Career Status Bonus (CSB) in exchange for lower future annuity payments than under the High-3 plan.[5,6] Specifically, as with High-3, retirement payments under Redux are based on the highest 36 months of

---

[1]In addition to the pension, service members have the option to contribute to the Thrift Savings Plan, a tax-deferred savings account sponsored by the federal government.

[2]Service members who entered service before August 1, 1986 do not make a retirement choice, but are automatically subject to either the High-3 plan (if they joined between September 8, 1980 and July 31, 1986) or the Final Basic Pay plan (if they joined before September 8, 1980). The Final Basic Pay plan is identical to the High-3 plan except that the 2.5 percent per year multiplier is applied to the service member's basic pay in the final month of service.

[3]Basic pay in the military is purely a function of years of experience and rank, so aside from the rare instances of reduction in rank, the highest 36 months of basic pay are generally the last 36 months served.

[4]The various allowances that military members receive (such as those for housing, meals, and clothing) are not included in basic pay and thus, under both Redux and High-3, allowances do not affect retirement annuity payments.

[5]Those who choose Redux agree to complete 20 YOS and are obligated to return the proportionate share of the bonus if they leave the force before that period. High-3 does not have a similar clause requiring an additional 5 year commitment, however, as we discuss below, quit rates for service members with between 15 and 20 YOS under any retirement plan are negligible, reflecting the fact that quitting entails forefitting the sizable pension.

[6]The Military Retirement Reform Act of 1986 directed that members joining the force after July 31, 1986 would be under the Redux formula, without the $30,000 Career Status Bonus. However, this act was repealed in 1999 (i.e., 7 years before the first retirement under Redux) due, in part, to the perceived inequities it was introducing in the retirement system. The repeal of the Military Retirement Reform Act of 1986 included a stipulation that service members could choose between the either the High-3 formula or the Redux formula plus the Career Status Bonus. It is not clear where the term "Redux" originated (for example, it is not used in the legistation which authorizes the retirement formula). Shafer (2000) speculates it was coined by military personnel bitter about the reduction in their retirement benefits relative to the High-3 plan.

basic pay during the service member's career. However, the multiplier is only 2 percent for each of the first 20 YOS (compared to the 2.5 percent under High-3). After 20 YOS, the multiplier increases to 3.5 percent for each year of service up to year 30, when it finally decreases to 2.5 percent for each year of service. Redux payments are also adjusted for inflation; however, the adjustment is based on the CPI minus 1 percent, so is less generous than under High-3. Furthermore, when a retiree under the Redux plan turns 62 years old, Redux payments are equalized to what they would be under High-3. However, because Redux payments are adjusted for inflation at a lower rate than High-3 payments, Redux payments once again are smaller than High-3 payments after the age of 62.

In summary, for service members who retire with less than 30 YOS, the Redux payments only equal High-3 payments when the retiree turns 62 years old. On the contrary, for those who retire with 30 or more YOS, payments under both retirement plans are equal during the first year of retirement and when the retiree turns 62 years old. In all other times, High-3 payments exceed Redux payments because of the higher multiplier and/or greater inflation adjustment. Table 1 compares the multipliers obtained by individuals under the High-3 and Redux. For instance, a service member retiring at 20 YOS under High-3 (Redux) receives 50% (40%) of her "high-3" basic pay. As another example, if she retires at 30 YOS, she gets a monthly payment of 75% of her "high-3" basic pay under both retirement plans. It is clear from the table that the difference between the two retirement formulas, in terms of multipliers, is greatest for those retiring at 20 YOS. Overall, Redux penalizes more those who retire as soon as possible (i.e., at 20 YOS), those with higher rank (i.e., those with a larger basic pay at the moment of retirement), and those who end up living longer (because they are subject to lower payments for a longer time).

2.2 The choice

When service members reach 14 and a half YOS, they receive an email stating that they are currently under the High-3 formula, but may choose the Redux formula and thus receive the $30,000 Career Status Bonus at 15 YOS.[7] All service members are required to meet with their supervisor, discuss the options, and then print, sign, and date a form stating their desired choice. The decision must be made before 15 YOS are reached, and the decision is irrevocable. As in non-military labor market settings, the presence of defaults is interesting in our context (Madrian and Shea, 2001; Beshears et al., 2009). On one hand, the email service members receive implies that High-3 is the "default" option, and aversion to change may prompt individuals to choose High-3. On the other hand,

---

[7]An email sent to a service member in November, 2012 can be seen at: http://faculty.nps.edu/jcunha/redux_high3_email.pdf

service members are required to make an active choice, so we may think that a stated "default" would not have as much influence on the decision as in other contexts.

The email service members receive describes the main features of both plans, and highlights the differences between them, including the lump sum payment, the differential multipliers and inflation factors, and the equalization of payments at 62 years old. The email strongly encourages members to discuss the decision with other people, such as financial advisors, colleagues, and supervisors, and to consult various documents available on DoD websites, such as interactive retirement calculators. The email explicitly suggests investigating the website of the Center for Naval Analysis (CNA), which contains several articles comparing the two retirement options. Some of these articles (e.g., Hattiangadi et al. (2013)) are openly in favor of the High-3 plan, showing simple examples which demonstrate that Redux annuity payments are lower than High-3 payments, and discussing the ways in which the $30,000 lump sum bonus can be substituted with a private sector loan. Other articles (e.g., Shafer (2000)) explicitly advocate the Redux plan, claiming that choosing Redux and investing the $30,000 bonus may in fact be more beneficial than the higher annuity payments under the High-3 plan.

2.3 Break-Even Discount Rates

The fundamental tension between these two opposing arguments surrounds the present value of the two streams of payments, and the break-even discount rate that equates them. The present value of each retirement plan is given by:

High-3

$$PV\left(High-3\right) = \frac{1}{\left(1+r\right)^m} \sum_{t=0}^{n} \frac{(1-t_2)Monthly\ Payment\ High-3_t}{\left(1+r\right)^t} \tag{1}$$

Redux

$$PV\left(Redux\right) = (1-t_1)30,000 + \frac{1}{\left(1+r\right)^m} \sum_{t=0}^{n} \frac{(1-t_2)Monthly\ Payment\ Redux_t}{\left(1+r\right)^t} \tag{2}$$

where r is the monthly discount rate, m is the number of months from the date of the retirement decision (i.e., 15 YOS) to the first retirement payment, n is the number of monthly payments during retirement, t_1 is the tax rate applied to the Redux lump sum, and t_2 is the tax rate applied to the monthly payments. The break-even discount rate is the value of r that equates equation (1) to equation (2).

Basic pay in the military is determined uniquely by rank and YOS, so rank and YOS at retirement are the only two factors differentially influencing the two annuity payments.

These formulas demonstrate that because the lump sum bonus does not vary, the larger is basic pay, the more is sacrificed in future annuity payments under Redux compared to High-3. To demonstrate the difference between the two formulas more concretely, we calculate the difference in present values and the break-even discount rates for representative service members of various ranks. Specifically, we assume personnel retire at 20 YOS ($m = 60$) and have a life expectancy of 79 years, and we consider a service member with the average age in the given rank.

Furthermore, as we do not know if individuals currently have additional family income nor do we know what their post-retirement income will be, we must make an assumption on the tax rates service members will face on the lump sum and the annuity payments. We use the following tax rates which a married service member with no additional family income would face: t_1, the marginal tax rate applied to the Redux bonus, is 25 percent for enlisted service members and 28 percent for officers, and t_2, the effective tax rate on monthly payments, is 15 percent for enlisted personnel and 20 percent for officers. In unreported analysis, we find that the estimated break-even discount rates are quite robust to small changes in the tax rates.

Table 2 summarizes this exercise. Consider an officer with rank O-4 at the time of retirement. In our dataset, there are 4,808 officers retiring with rank O-4 amongst whom the average age at 20 YOS is 42.52 years. An officer with this average age faces a break-even discount rate of 18.9 percent; at a discount rate of 5 percent, the present value of High-3 exceeds that of Redux by $117,719, while at a discount rate of 20 percent, the present value of Redux exceeds that of High-3 by $3,828. As another example, amongst the 38,301 enlisted personnel who retired with a rank of E-7, the average age at 20 YOS is 40.07 years and the break-even discount rate is 15.1 percent. For these E-7s, the difference in present value of High-3 over Redux is $68,749 under a 5 percent discount rate, while it is -$13,148 under a 20 percent discount rate. Finally, the last column shows that the break-even discount rate increases with rank, reflecting the fact that salaries increase with rank. It is also clear that officers face higher break-even discount rates than do enlisted personnel, which is a consequence of their higher salaries.

3   Personal Discount Rates and Demographics

The traditional model of intertemporal choice provides us with a theoretical framework to study the High-3 versus Redux decision. In one extreme, service members face the same borrowing and lending rate and can use a frictionless capital market to replicate any desired stream of payments. In this scenario, individuals would calculate the present value of each alternative, discounting at the market interest rate, and would choose the

retirement plan with the highest present value. Because markets are perfect and frictionless, this course of action would be optimal for any set of preferences and personal discount rate. For example, if High-3 has a higher present value at the current market rate but the service member wants the $30,000 bonus at 15 YOS, she could easily borrow that amount of money from the bank and choose High-3. Then, she could use the larger High-3 monthly payments to repay the loan and be better off, independently of her intertemporal personal tastes.

In the other extreme, service members have no access to capital markets in order to undertake the aforementioned intertemporal transactions. The choice between High-3 and Redux thus depends entirely on one's preferences and personal discount rate. For example, for a risk-neutral individual, if the personal discount rate is below the break-even discount rate, then High-3 will be preferred over Redux. The opposite will be true if the personal discount rate is above the break-even discount rate.

In reality, service members have varying degrees of access to capital markets, and we can not observe this information in our data.[8] For this reason, we follow the literature and assume no access to capital markets (e.g. Warner and Pleeter (2001)). Then, we characterize the differences in demographic characteristics of those choosing the two plans and, assuming a risk-neutral decision maker, we can back out the personal discount rates implied by these choices.

To the extent that capital market imperfections obstruct the previous financial transaction, the retirement choice and, thus, the personal discount rate, will be associated with personal characteristics. There is ample evidence in this direction. Gilman (1976) and Black (1983) find that people with higher levels of education and income, as well as older individuals, exhibit lower personal discount rates. They also report that Black individuals seem to have higher personal discount rates than Whites. More recently, Harrison et al. (2002) find similar evidence for the Danish population. Warner and Pleeter (2001) also find that personal discount rates decrease with age, and that officers (who generally have higher income and education) have lower personal discount rates than enlisted personnel.

The factors affecting the relationship between individual demographics and personal discount rates are difficult to determine. For instance, individuals with higher income may have better credit scores and the possibility to post collateral when borrowing money,

---

[8]Furthermore, there is a feature of the retirement plans that makes the above financial transaction particularly difficult to instrument in real life. That is, the bonus of $30,000 is received at 15 YOS while, in both plans, the first monthly payment occurs when retirement begins, which happens at 20 YOS minimum. This implies the service member should be able to get a $30,000 loan from the bank with the possibility to start repaying it 5 years (or more) later. Considering the usual loan terms, this repayment structure seems difficult to achieve for an average person. Possibly, this situation makes service members be closer to the second extreme case in which they do not have access to capital markets.

which would imply lower borrowing rates. This easier access to capital markets would make them exhibit lower personal discount rates. The objective of our paper is not to identify the factors underlying that association, but to describe how the retirement choice and personal discount rates relate to personal characteristics.

4 Data and Sample

We obtained retirement choice data from the US military's personnel database, housed by the Defense Manpower Data Center (DMDC). Our sample includes the universe of retired, active duty military service members in the Army, Air Force, Navy, and Marines who were (i) required to make a decision between High-3 and Redux, and (ii) retired with a pension as of October 2012 (the most recent data available). As mentioned above, service members who enlisted since August 1, 1986 were required to make a retirement decision at 14.5 YOS; thus we observe decisions that were made starting in August 2001 until October 2007. Several observations (534) are recorded as retiring prior to 20 YOS or making the retirement choice after 15 YOS; we exclude them as it is not clear whether this reflects actual behavior or miscoded data. Basic pay (i.e., salary) is published by the Defense Finance and Accounting Service, and we append salary at retirement for each individual. We also add the break-even discount rate computed for each service member with the assumptions described in Subsection 2.3, except that we now consider the actual YOS at retirement (i.e., we do not assume the individual retires exactly at 20 YOS). Figure 1 contains box plots with the distributions of break-even discount rates for service members of various ranks at retirement. The spread of break-even discount rates within a rank reflects the distribution of ages at retirement, with older people having lower break-even discount rates because of their fewer expected payments in retirement. Our final sample contains 88,736 individuals.[9]

Note that because our sample is only of retired service members who are receiving a pension, we do not observe members who have not yet retired, but have made a retirement choice.[10] These missing observations comprise two groups: (i) those who quit before 20 YOS and (ii) those who are still working. While we can not measure the size of these groups in our data, various studies suggest there is a negligible number of service members in the first group (e.g., Asch et al. (2013)). This reflects the fact that five or less years of continued service will vest the sizable pension and quitting will yield no pension. The

---

[9]DMDC also collects data from the Coast Guard, but there are very few Coast Guard members who made the retirement choice (634 members). Interestingly, only one of these Coast Guard members chose Redux.

[10]The original election data is stored by the individual services and is not transferred to the DMDC until the service member retires. We have not been able to access this original election data.

second group is potentially more problematic for our study, if service members choose their retirement plan based on their expected date of retirement. We address this issue in more detail below, and offer evidence that suggests this sample selection issue does not impede our ability to analyze the determinants of the retirement choice with the sample at hand.

Summary Statistics

Table 3 presents summary statistics of the variables used in our analysis. Ten percent of the sample are officers and, due to the inherent differences between officers and enlisted personnel, we present summary statistics for the sample as a whole as well as for officers and enlisted personnel separately.

While 38 percent of service members chose Redux overall, there is a large disparity across officers and enlisted personnel: 42 percent of enlisted personnel chose Redux and only 7 percent of officers chose Redux. The average age of those making the retirement choice is about 35 years old, and officers are slightly older than enlisted personnel, reflecting the fact that officers are more likely to have attended college before joining the military.

Basic military pay is purely a function of rank and years of experience, and is clearly larger for officers than enlisted personnel.[11] Despite their higher age, the break-even discount rate is larger on average for officers (16.9 percent) than for enlisted members (12.6 percent), reflecting the much larger salaries of the former.

Relative to the size of the services, the Air Force is over-represented in this sample, with 29 percent of all service members who made a retirement choice at 15 YOS - this is partly reflecting the fact that pilots are officers. The distribution across the other services largely reflects their relative size, with the Marines as the smallest force.

The time period of our data spans two wars (in Iraq and Afghanistan), and the nature of our modern military implies only a small percentage of the force in specific occupations can expect to be exposed to combat. Based on conversations with knowledgeable officers, we encode occupations as either "combat intensive" or not, and find that 11.4 percent of enlisted personnel and 4.9 percent of officers are in such fields.

The vast majority of personnel are male (87 percent), and a large majority are White (64 percent). 27 percent of enlisted personnel are Black while 9 percent of officers are Black. Smaller percentages of the sample are Asian or of a mixed or unknown race (the 'Other race' category).

---

[11]The military compensates certain occupations above basic pay for the nature of the job (e.g., accepting more risk), and some personnel receive periodic bonuses to renew their employment contract for a certain number of years. We do not observe enough detail in our data to determine these additions to basic pay.

Most of the sample is married (82 percent), and most have at least one dependent (88 percent). The average number of dependents (including those who have zero dependents) is about 2.5. The Armed Forces Qualifying Test (AFQT) is a measure of cognitive ability, and is taken by all enlisted personnel (but not officers) upon entering the military. The AFQT is a percentile score that reflects the distribution of test scores in the current population of youth that have taken the test.[12]

Overall, 5 percent of the sample has a graduate degree (a masters, professional degree, or a doctorate), 21 percent have a college degree (bachelors or associates) as their highest educational attainment, and 73 percent has only a high school diploma (traditional or high-school equivalent certificate). The distribution of educational attainment is very different between officers and enlisted personnel, however, reflecting the fact that a college degree is generally required to become an officer and the military often sends officers to obtain post-graduate degrees.

5 Methodology and Results

5.1 Methodology

We explore the correlates of choosing Redux over High-3 through a simple model which expresses $Redux_i$, an indicator of individual i choosing Redux over High-3, as function of the linear combination of the observable individual level characteristics $\mathbf{X_i}$ and indicators for the year in which the choice was made, δ_t:

$$Redux_i = \beta \mathbf{X_i} + \delta_t + \varepsilon_i \tag{3}$$

We include the year-of-choice indicators in order to allow for secular trends in Redux take-up over time. In practice, we estimate this relationship with a probit model to facilitate the calculation of implied personal discount rates. Note that our data is not a panel; rather, it is a single cross section, yet contains individuals who made the retirement choice in different years (i.e., 2001, ... , 2007).

5.2 Results

Table 4 contains marginal effects from the probit model for the entire sample (column 1), as well as for enlisted personnel and officers separately (columns 2 and 3). Owing partly to the large sample size, most coefficients in the pooled and enlisted-only models are significant at conventional levels. In the officer-only regression, fewer covariates are

---

[12]For unknown reasons, 6,566 (about 8 percent) of the enlisted sample is missing the AFQT score. In the regression analysis below, we include an indicator variable for this missing data to avoid dropping them from the estimation sample.

significant - this is partly reflecting the smaller sample, but it is clear that the magnitude of the point estimates is also generally smaller.

Reiterating our observation in Table 3, column 1 shows that conditional on the observable characteristics, officers are 13.02 percentage points less likely to take Redux than enlisted personnel. Apparently, about two third of the raw difference in Redux take-up between enlisted personnel and officers is explained by differences in observable characteristics. The negative coefficient on officers could be partially due to the fact that 48.2% officers have a graduate degree while 43.2% of them have a college degree, which could help them better understand the concept of present values. The great majority of enlisted personnel, 80.3%, have only a high school diploma. Alternatively, the higher qualification of officers could make their transition to the civilian sector at 20 YOS easier. At that moment, the disadvantage of Redux over High-3 is at its maximum.

To the extent that service members are forward thinking, the expected number of annuity payments and salary at retirement should be important determinants of the Redux/High-3 choice. We do not observe the expected number of annuity payments (i.e., life expectancy), but it is reasonable to hypothesize that age at 15 YOS is inversely related to the expected number of annuity payments. Indeed, for every additional year of age at 15 YOS, enlisted personnel and officers are 1.14 and 0.41 percentage points less likely to choose Redux, respectively. Salary is also negatively related to the propensity to choose Redux, but as with age, the relationship is stronger for enlisted personnel than for officers. Overall, for every $10,000 increase in salary, service members are 2.71 percentage points less likely to choose Redux. The sign of this coefficient is consistent with the fact that salary has a strong impact on the dollar advantage of High-3 over Redux. The magnitude of this effect can be observed in Table 2 by comparing the present value of High-3 minus Redux for officers and enlisted personnel. The former have a considerably higher salary than the latter and, thus, face a much larger dollar advantage of High-3 over Redux.

As discussed above, the break-even discount rate is determined uniquely by the expected number of annuity payments and salary at retirement. However, the relationship is not linear and there does appear to be some independent informational content in the break-even discount rate: the higher the break-even discount rate, the less likely is the choice of Redux. We discuss this finding in more detail below.

Relative to the Air Force (the omitted category), the service members in the Navy (both enlisted and officers) and officers in the Army are less likely to take Redux, while enlisted personnel in the Marines are more likely to take Redux. It is not entirely clear what is driving service-specific differences, but one speculation is that informational campaigns and/or advising by commanding officers vary across branches. Furthermore, the

nearness of Marines to combat occupations might induce them to choose Redux more than the other services.

In fact, enlisted personnel - but not officers - are more likely to take Redux when they are in a combat intensive versus a non-combat intensive field. These retirement choices were made in a time of war, and those in combat intensive services, perhaps especially those enlisted personnel who are more likley to be ground troops, may value the lump sum relatively more because it does not have to be repaid upon death in the line of duty, while retirement benefits do stop upon death.[13] To the extent that this relationship is reflecting enlisted personnel's subjective life expectancy, this result is consistent with rational decision making under the life-cycle model of consumption. Similar behavior has been shown amongst retirees timing of Social Security claiming (Coile et al., 2002; Hurd et al., 2004).

Male enlisted personnel are more likely to choose Redux, while there is no evidence of differential take-up by gender amongst officers. Relative to White service members, Blacks are much more likely to take Redux: 12.4 percentage points more amongst enlisted and 5.12 percentage points more amongst officers. Asians are not differentially likely to take Redux compared to Whites.

Single enlisted personnel, compared to married personnel (the omitted category), are less likely to take Redux. In both the enlisted and officer populations, divorced individuals are more likely to take Redux than are married individuals.[14] It is unclear a priori whether having dependents will make a lump sum more attractive. We do in fact find a positive relationship between the likelihood of choosing Redux and both having dependents and the number of dependents. Service members with dependents may face credit constraints and have to incur large expenses such as tuition or child care, in which case the benefits of the $30,000 lump sum payment may outweigh the lower future annuity payments.

Amongst enlisted personnel, higher AFQT scores are associated with a lower likelihood of taking Redux, but the effect is small in magnitude and of marginal significance. For example, moving from the 25th to the 75th percentile of AFQT scores (from a score of 43 to a score of 74) only decreases the likelihood of choosing Redux by 0.6 percentage points. Educational attainment, on the other hand, is strongly and significantly associated with retirement choice: amongst both enlisted personnel and officers, we find those with either a college or a graduate degree are less likely to choose Redux than those with a

---

[13]However, there are insurance plans that cover the surviving spouse from the financial loss produced by the death of the service member. For instance, for a monthly premium, the Survivor Benefit Plan pays participants a fraction of the retirement payments in case of retiree's death.

[14]The Uniformed Services Former Spouse Protection Act allows state courts to consider service member's retirement payments as marital property that can be divided in case of divorce action.

high school degree.

Finally, the indicators for when the choice was made demonstrate that the likelihood of choosing Redux has gone down over time amongst enlisted personnel, but has stayed relatively constant amongst officers (note the omitted variable is making the choice in 2001). One potential explanation for this trend amongst enlisted personnel is that in real terms, the value of the lump sum payment under Redux goes down over time as it is not adjusted for inflation. To be sure, this fact is reflected by an increasing break-even discount rate, but it is possible that there is an additional behavioral response to a lower lump sum payment. Another potential explanation for the over time decrease is learning and dissemination of information.

5.3   Sample Selection

As mentioned above, our data is a selected sample of service members who choose between Redux and High-3 at 15 YOS, since we only observe this choice for those members who have already retired by October 2012 (the date our cross-section was accessed). Unfortunately, we have not been able to obtain data on those who made the decision and are still working. The degree of sample selection is lower for older cohorts, as we observe more retirees every year. For example, for those that made the choice in 2001, we observe retirements up to 26 YOS, while for those who made the choice in 2007 we see all retirements at 20 YOS and only a few at 21 YOS.

This sample selection is summarized in Table 5, which contains the distribution of YOS at retirement within our sample, by the year in which the retirement choice was made. Looking down the columns, the numbers of members retiring are for the most part decreasing. Also, see that in 2001, few retirements happen by the 26th year of service. But, as mentioned above, we do not know the number of service members who made the retirement choice, and are still in active duty.

A problem for our analysis is that the advantage of High-3 over Redux diminishes the longer one stays in the military past 20 YOS. Thus, we would expect those who choose Redux to retire later than those who choose High-3. One way to explore whether this selection issue is biasing our results is to examine the earliest cohorts of our sample, for whom we have had the most time to observe retirements. We thus explore those who made the choice in 2001 or 2002, for whom we observe retirements up to 26 YOS. In this sample, those who chose Redux had 21.35 YOS at retirement compared to 21.31 YOS for those who chose High-3. While this difference is statistically significant at the six percent level, it is hardly economically meaningful. Furthermore, we re-estimate the models shown in Table 4 on the sample of those who made the retirement choice in 2001

14

or 2002. The results are shown in Table 6, and it is clear that the results are quite similar to those obtained when using the sample of all retired individuals in Table 4. In particular, all coefficients but one (being in the Navy) keep their original sign, and the statistical significance remains essentially the same, despite the substantial reduction in sample size (from 88,736 to 21,516 observations). While not conclusive, we believe this evidence suggests sample selection is not particularly problematic for our results.

6   Estimates of the Personal Discount Rate

Using the technique suggested by Gilman (1976) and Black (1983), and implemented by Ashenfelter (1983) and Warner and Pleeter (2001), the probit model we estimated in the previous section can also be used to infer the personal discount rates implied by the retirement choices. We do this experiment for all individuals in the sample and calculate mean discount rates across different personal characteristics, as seen in Table 7. Overall, the mean personal discount rate is 10.05 percent amongst enlisted personnel and 6.49 percent amongst officers. These rates are somewhat below the estimates of Warner and Pleeter (2001), which might partially be the result of the significant explanation efforts by the DoD regarding the advantages of High-3 over Redux. However, the association of the personal discount rates with individual characteristics is largely consistent with that study. For instance, discount rates are negatively related to females, age at 15 YOS, rank, education level, singles, and not being in combat intensive occupations. We also find a positive relationship between the estimated discount rates and being non-white, divorced, the number of dependents, and being a member of the Army or Marine Corps. Finally, we find that the discount rates are also negatively associated with the calendar year of the decision. This result might be associated with the fact that the percentage of service members choosing Redux is falling every year, as described in Subsection 5.2.

6.1   Are people making rational choices?

Fundamentally, the choice between Redux and High-3 reflects a person's preference for current versus future consumption. The break-even discount rate is a useful summary statistic to explore whether people are making wise choices. If this break-even discount rate is low, we would expect that the choice of Redux is more favorable. For example, if the break-even rate is lower than the market return on an investment, then the service member could invest the $30,000 in the market and be better off than taking High-3. Or, if the break-even rate is lower than the interest a service member is paying on debt, he could again be better off by taking the $30,000 now and paying off the debt rather than taking High-3. Or, if the break-even rate is lower than the interest rate on a loan, and the

15

service member wanted to borrow $30,000 at the 15 YOS mark, again Redux would be more favorable than High-3.

The database allows us to study this relationship between break-even discount rates and the Redux decision. Interestingly, we obtain some indirect evidence of rationality regarding service members' behavior. The Redux plan can be seen as a loan in which we receive the bonus upfront (i.e., at 15 YOS) and then repay it through lower monthly payments in retirement. From this perspective, the break-even discount rate is the interest rate paid for the loan. Then, if we divide service members in groups according to that rate, we should find that those groups facing higher break-even discount rates exhibit lower proportions of service members choosing Redux. This is exactly what Figures 2 and 3 display. That is, we divide enlisted personnel and officers by deciles of the distribution of observed break-even discount rates, and compute the fraction choosing Redux. In both cases, deciles representing higher break-even discount rates exhibit lower proportions of members choosing Redux.

Of course, all of the above explanations involve rational decisions. It is well known that behavioral considerations may drive people to be myopic (discount hyperbolically), and thus favor current consumption at the expense of future consumption even if they would not want to do so in hindsight.

7 Conclusion

This paper studies the retirement decisions of U.S. service members between the two current plans: High-3 and Redux. While we show that in the vast majority of cases the present value of High-3 is considerably larger than that of Redux, more than 40 percent of service members in our database chose Redux. We also find that the probability of choosing Redux is significantly related to most observable demographic characteristics. For instance, females, officers, education, age at the moment of the decision, and being single are personal features that strongly reduce the likelihood of choosing Redux. In contrast, the probability of selecting Redux is significantly positively associated to being non-white or divorced, being in the Marine Corps, and number of dependents. We also find that these personal features affect the estimates of personal discount rates. For example, officers, females, whites, single and older service members exhibit lower personal discount rates. Finally, we provide some indirect evidence of rational behavior by service members by showing that those who face higher break-even discount rates are less likely to choose Redux.

What is particularly attractive of this study is that it involves actual decisions of about 90,000 people over large sums of money, in many cases exceeding hundreds of thousands

of dollars. Understanding how these service members with heterogenous demographics make retirement choices has important implications for public policy. For instance, it is key in formulating retention policies that allow the DoD to shape the force as needed. It is also fundamental in the design of new, more affordable and customized retirement plans. In this sense, we find that the possibility to choose Redux implied savings to the DoD of more than $2 billion in retirement payments, while it gave service members the flexibility to choose over two alternative income streams according to their personal preferences. Furthermore, the observed reduction in the selection of Redux over the years could be (partially) reversed by small changes in the retirement plans, such as increasing the lump sum and/or indexing it by inflation. These policy changes could be very attractive to DoD given the large savings implied by Redux. Finally, given that the individuals in our database have personal characteristics that make them representative of wide segments of the U.S. population, the findings in this paper may also be appealing to firms in the private sector attempting to create or modify their savings and retirement plans.

References

Asch, Beth J, Michael G Mattock, and James Hosek, *A New Tool for Assessing Workforce Management Policies Over Time*, Rand Corporation, 2013.

Ashenfelter, Orley, "Determining participation in income-tested social programs," *Journal of the american Statistical association*, 1983, *78* (383), 517–525.

Benzion, Uri, Amnon Rapoport, and Joseph Yagil, "Discount rates inferred from decisions: An experimental study," *Management science*, 1989, *35* (3), 270–284.

Beshears, John, James J Choi, David Laibson, and Brigitte C Madrian, "The importance of default options for retirement saving outcomes: Evidence from the United States," in "Social security policy in a changing environment," University of Chicago Press, 2009, pp. 167–195.

Black, Matthew, "Personal Discount Rates: Estimates for the Military Population," *Final Report of the Fifth Quadrennial Review of Military Compensation*, 1983, *1*.

Chesson, Harrell and W Kip Viscusi, "The heterogeneity of time-risk tradeoffs.," *Journal of Behavioral Decision Making*, 2000, *13* (2), 251–258.

Choi, James J, David Laibson, and Brigitte C Madrian, "$100 bills on the sidewalk: Suboptimal investment in 401 (k) plans," *Review of Economics and Statistics*, 2011, *93* (3), 748–763.

Coile, Courtney, Peter Diamond, Jonathan Gruber, and Alain Jousten, "Delays in claiming social security benefits," *Journal of Public Economics*, 2002, *84* (3), 357 – 385.

Coller, Maribeth and Melonie B Williams, "Eliciting individual discount rates," *Experimental Economics*, 1999, *2* (2), 107–127.

Defense Business Board, "Modernizing the Military Retirement System," *US Department of Defense*, 2011, *Report FY11-05.*

Finkelstein, Amy and James Poterba, "Adverse selection in insurance markets: Policyholder evidence from the UK annuity market," *Journal of Political Economy*, 2004, *112* (1), 183–208.

Gately, Dermot, "Individual discount rates and the purchase and utilization of energy-using durables: Comment," *Bell Journal of Economics*, 2005, *11* (1), 373–374.

Gilman, Harry J, *Determinants of implicit discount rates: An empirical examination of the pattern of voluntary pension contributions of employees in four firms*, Center for Naval Analysis, 1976.

Harrison, Glenn W, Morten I Lau, and Melonie B Williams, "Estimating individual discount rates in Denmark: A field experiment," *The American Economic Review*, 2002, *92* (5), 1606–1617.

Hattiangadi, Anita U, Gary Lee, Robert W Shuford, and Aline O Quester, *Retirement choice: 2013*, Center for Naval Analysis, 2013.

Hausman, Jerry A, "Individual discount rates and the purchase and utilization of energy-using durables," *The Bell Journal of Economics*, 1979, *10* (1), 33–54.

Hesketh, Beryl, "Time perspective in career-related choices: Applications of time-discounting principles," *Journal of Vocational Behavior*, 2000, *57* (1), 62–84.

Hurd, Michael D., James P. Smith, and Julie M. Zissimopoulos, "The effects of subjective survival on retirement and Social Security claiming," *Journal of Applied Econometrics*, 2004, *19* (6), 761–775.

Madrian, Brigitte C. and Dennis F. Shea, "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior," *The Quarterly Journal of Economics*, 2001, *116* (4), 1149–1187.

Office of the Actuary, "Statistical Report on the Military Retirement System for Fiscal Year 2012," *US Department of Defense*, 2013.

Ruderman, Henry, MD Levine, and JE McMahon, "Energy efficiency choice in the purchase of residential appliances," Technical Report, Lawrence Berkeley Laboratory, CA (USA) 1984.

Shafer, Vivian C, "Choosing Between the High-Three and the REDUX Military Retirement Programs: Thrift Savings Plan Participation a Valuable Option," *The Army Lawyer*, 2000, pp. 18–23.

Thaler, Richard, "Some empirical evidence on dynamic inconsistency," *Economics Letters*, 1981, *8* (3), 201–207.

Thaler, Richard H and Cass R Sunstein, "Libertarian paternalism," *The American Economic Review*, 2003, *93* (2), 175–179.

U.S. Department of Labor, "Private Pension Plan Bulletin: Abstract of 2011 Form 5500 Annual Reports," *Employee Benefit Security Administration. Available at: http://www.dol.gov/ebsa/pdf/2011pensionplanbulletin.pdf*, 2013.

Warner, John T and Saul Pleeter, "The personal discount rate: Evidence from military downsizing programs," *American Economic Review*, 2001, *91* (1), 33–53.

Figure 1: Box plots of the distribution of break-even discount rates for various ranks at retirement.
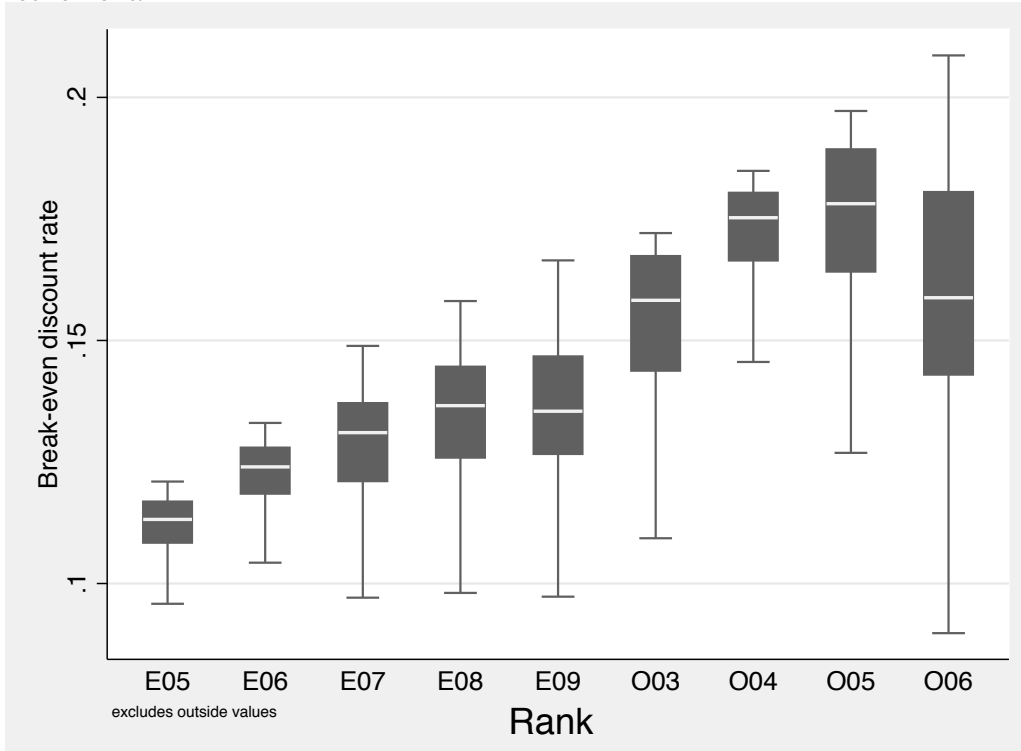

Figure 2: Proportion of enlisted personnel choosing Redux by deciles of the distribution of break-even discount rates.
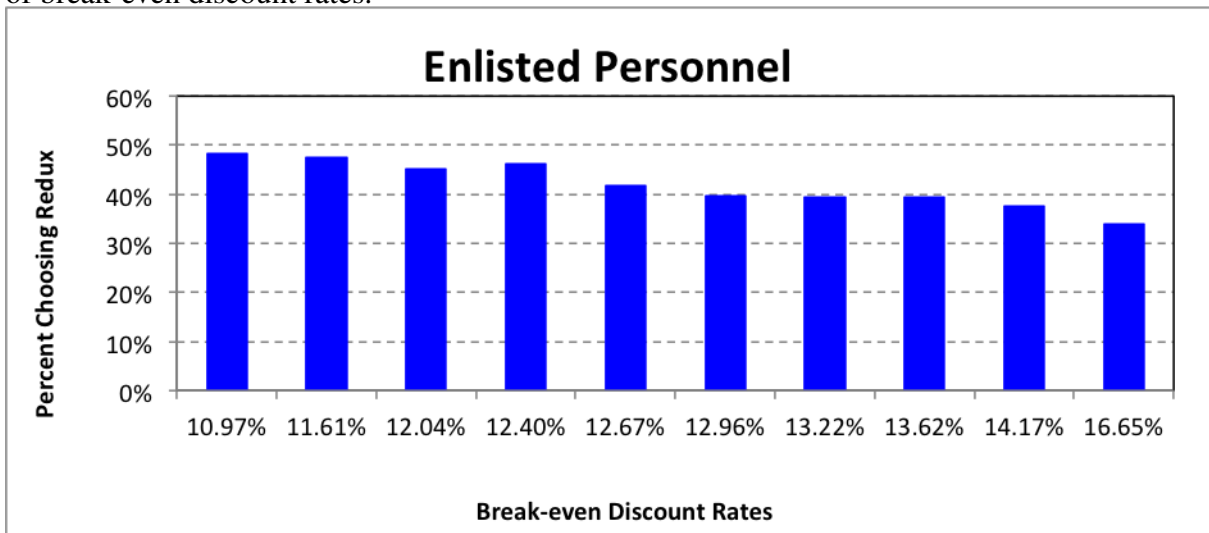
Figure 3: Proportion of officers choosing Redux by deciles of the distribution of break-even discount rates.
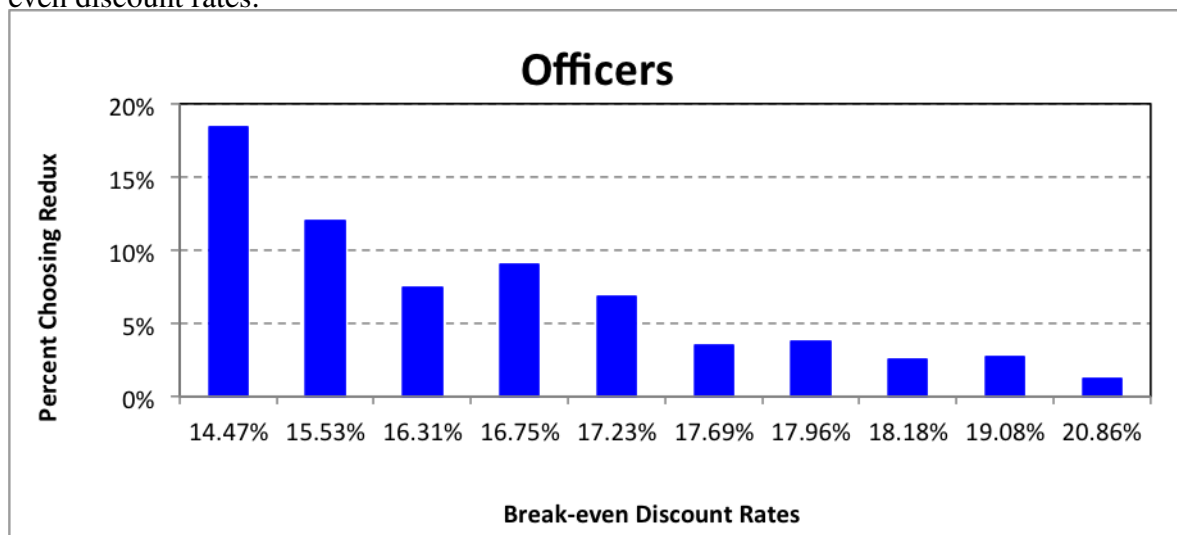
Table 1: Multipliers obtained by service members under High-3 and Redux for various years of service.

Retirement Plan	Years of Service									
	20	21	22	23	24	25	30	35	40	41
High-3	50	52.5	55	57.5	60	62.5	75	87.5	100	102.5
Redux	40	43.5	47	50.5	54	57.5	75	87.5	100	102.5

Table 2: The differential benefits of High-3 and Redux for service members of common ranks at retirement.

Rank at retirement	Number of retirees	Average age at 20 YOS	For a service member of the average age with the given rank:				
			Present value of High-3 minus Redux at a discount rate of:				Break-even
			5 percent	10 percent	15 percent	20 percent	discount rate
O-6	354	48.25	$95,654	$30,659	$4,714	-$7,329	0.211
O-5	4,470	43.89	$116,564	$38,545	$8,404	-$5,274	0.200
O-4	4,808	42.52	$117,719	$40,094	$9,987	-$3,828	0.189
O-3	1,274	40.41	$91,291	$22,913	-$1,192	-$11,271	0.176
E-9	834	40.06	$89,702	$21,741	-$2,217	-$12,234	0.170
E-8	9,602	39.91	$79,696	$19,142	-$2,665	-$12,026	0.159
E-7	38,301	40.07	$68,749	$14,681	-$4,790	-$13,148	0.151
E-6	29,984	40.05	$58,400	$12,143	-$5,161	-$12,882	0.140
E-5	3,456	41.00	$45,403	$6,578	-$7,947	-$14,427	0.117

Notes: The present value calculations assume personnel retire at 20 years of service, have a life expectancy of 79 years, and face the marginal tax rates as detailed in the text.

Table 3: Summary statistics

	All		Enlisted Personnel		Officers	
	Mean	(s.d.)	Mean	(s.d.)	Mean	(s.d.)
	(1)		(2)		(3)	
Officer	0.103	(0.303)	--	--	--	--
Chose Redux	0.383	(0.486)	0.420	(0.493)	0.067	(0.251)
Age at 15 years of service	35.519	(3.134)	35.219	(2.905)	38.146	(3.772)
Salary at retirement (yearly, $10k)	5.094	(1.472)	4.670	(0.705)	8.805	(1.193)
Break-even discount rate	0.130	(0.019)	0.126	(0.012)	0.169	(0.019)
Army	0.282	(0.450)	0.283	(0.451)	0.269	(0.443)
Air Force	0.293	(0.455)	0.287	(0.452)	0.349	(0.477)
Marines	0.074	(0.262)	0.065	(0.246)	0.154	(0.361)
Navy	0.351	(0.477)	0.365	(0.481)	0.228	(0.419)
Combat intensive occupation	0.107	(0.309)	0.114	(0.317)	0.049	(0.215)
Male	0.871	(0.336)	0.876	(0.330)	0.825	(0.380)
White	0.639	(0.480)	0.617	(0.486)	0.832	(0.374)
Black	0.250	(0.433)	0.268	(0.443)	0.093	(0.291)
Asian	0.042	(0.200)	0.044	(0.206)	0.020	(0.139)
Other race	0.081	(0.273)	0.070	(0.256)	0.055	(0.228)
Married	0.817	(0.387)	0.814	(0.389)	0.838	(0.368)
Single	0.116	(0.321)	0.117	(0.321)	0.115	(0.319)
Divorced	0.066	(0.249)	0.068	(0.253)	0.047	(0.211)
Has dependents	0.878	(0.328)	0.879	(0.326)	0.862	(0.345)
Number of dependents	2.543	(1.545)	2.546	(1.547)	2.514	(1.530)
AFQT score	--	--	58.580	(18.862)	--	--
Graduate degree	0.054	(0.226)	0.005	(0.071)	0.482	(0.500)
College degree	0.206	(0.405)	0.181	(0.385)	0.432	(0.495)
High school diploma	0.728	(0.445)	0.803	-0.398	0.079	(0.269)
Observations	88,736		79,634		9,102	

Notes:

(1) The sample includes the universe of retired, active duty military service members in the Army, Air Force, Navy, and Marines who were (i) required to make a decision between High-3 and Redux, and (ii) retired as of October 2012; thus, the sample includes all decisions that were made starting in August 2001 until October 2007.

(2) Other race inlcudes Native Americans, service members of mixed races, and those with unknown race.

(3) The Armed Forces Qualifying Test (AFQT) is a standardized aptitude test taken only by enlisted service members; the score reflects the percentile relative to the current population of youth who have taken the test.

(4) Service members are classified as completing a college degree if they have obtained baccalaureate degree, an associates degree, a professional nursing diploma, or an occupational program certificate; a graduate degree if they have a master's degree, a professional degree, or a doctoral degree; and high school if they have completed high school or obtained a high school equivalency certificate.

(5) 6,566 observations (about 8 percent) in the enlisted sample are missing the AFQT score.

Table 4: The correlates of choosing the Redux over the High-3 retirement plan.

	Sample =	All		Enlisted Personnel		Officers	
	Outcome =	Chose Redux		Chose Redux		Chose Redux	
		Marginal effect	(s.e.)	Marginal effect	(s.e.)	Marginal effect	(s.e.)
		(1)		(2)		(3)	
Officer		-0.1302***	(0.0115)				
Age at 15 years of service		-0.0123***	(0.0007)	-0.0114***	(0.0008)	-0.0041***	(0.0006)
Salary at retirement (yearly, $10k)		-0.0271***	(0.0025)	-0.0208***	(0.0028)	-0.0177***	(0.0020)
Break-even discount rate		-3.5041***	(0.1779)	-3.2063***	(0.1992)	-1.4822***	(0.1334)
Army		-0.0012	(0.0047)	-0.0060	(0.0052)	-0.0102*	(0.0054)
Marines		0.0221***	(0.0074)	0.0104	(0.0082)	-0.0000	(0.0070)
Navy		-0.0472***	(0.0046)	-0.0503***	(0.0051)	-0.0137**	(0.0056)
Combat intensive occupation		0.0349***	(0.0056)	0.0364***	(0.0058)	-0.0064	(0.0090)
Male		0.0246***	(0.0053)	0.0272***	(0.0057)	0.0017	(0.0061)
Black		0.1192***	(0.0042)	0.1204***	(0.0046)	0.0512***	(0.0100)
Asian		0.0075	(0.0088)	0.0031	(0.0093)	0.0112	(0.0166)
Other race		0.0231***	(0.0069)	0.0213***	(0.0073)	0.0070	(0.0092)
Single		-0.0184***	(0.0064)	-0.0204***	(0.0068)	0.0029	(0.0087)
Divorced		0.0672***	(0.0073)	0.0667***	(0.0076)	0.0356**	(0.0139)
Has dependents		0.0173**	(0.0070)	0.0175**	(0.0075)	0.0013	(0.0093)
Number of dependents		0.0403***	(0.0014)	0.0421***	(0.0015)	0.0099***	(0.0017)
AFQT score				-0.0002	(0.0001)		
Graduate degree		-0.0993***	(0.0130)	-0.0501**	(0.0250)	-0.0216***	(0.0076)
College degree		-0.0482***	(0.0046)	-0.0491***	(0.0049)	-0.0193***	(0.0060)
Made choice in 2002		-0.0340***	(0.0091)	-0.0376***	(0.0097)	-0.0047	(0.0133)
Made choice in 2003		-0.0738***	(0.0089)	-0.0839***	(0.0096)	-0.0078	(0.0128)
Made choice in 2004		-0.0764***	(0.0090)	-0.0870***	(0.0097)	-0.0071	(0.0132)
Made choice in 2005		-0.0989***	(0.0090)	-0.1133***	(0.0097)	-0.0010	(0.0145)
Made choice in 2006		-0.1031***	(0.0093)	-0.1161***	(0.0101)	-0.0127	(0.0125)
Made choice in 2007		-0.1039***	(0.0095)	-0.1180***	(0.0104)	-0.0086	(0.0132)
Observations		88,736		79,634		9,102	

Notes: *** p<0.01, ** p<0.05, * p<0.1

(1) Standard errors in parentheses.

(2) Omitted categories are: Air Force, White, married, high school degree, and made the choice in 2001.

(3) An indicator variable is included in the enlisted regression to control for the observations mising an AFQT score.

Table 5: The distribution of years of service at retirement within the sample of current retirees, by year in which the retirement choice was made.

YOS at retirement	Year in which retirement choice was made						
	2001	2002	2003	2004	2005	2006	2007
20	1,628	8,977	8,873	9,034	8,433	7,981	7,932
	(51.42)	(48.92)	(50.52)	(54.04)	(61.3)	(74.75)	(93.25)
21	448	2,768	2,709	3,224	3,195	2,440	574
	(14.15)	(15.08)	(15.42)	(19.28)	(23.23)	(22.85)	(6.75)
22	338	1,921	2,099	2,682	1,950	256	0
	(10.68)	(10.47)	(11.95)	(16.04)	(14.18)	(2.4)	(0)
23	184	1,596	1,775	1,642	178	0	0
	(5.81)	(8.7)	(10.11)	(9.82)	(1.29)	(0)	(0)
24	321	2,476	2,025	136	0	0	0
	(10.14)	(13.49)	(11.53)	(0.81)	(0)	(0)	(0)
25	156	555	82	0	0	0	0
	(4.93)	(3.02)	(0.47)	(0)	(0)	(0)	(0)
26	91	57	0	0	0	0	0
	(2.87)	(0.31)	(0)	(0)	(0)	(0)	(0)
Total	3,166	18,350	17,563	16,718	13,756	10,677	8,506
	(100)	(100)	(100)	(100)	(100)	(100)	(100)

Notes: Sample includes both officers and enlisted personnel. Cell frequencies; column percentages in parentheses.

Table 6: The correlates of choosing the Redux over the High-3 retirement plan for those who made the retirement decision in either 2001 or 2002.

	All		Enlisted Personnel		Officers	
Sample =	All		Enlisted Personnel		Officers	
Outcome =	Chose Redux		Chose Redux		Chose Redux	
	Marginal effect	(s.e.)	Marginal effect	(s.e.)	Marginal effect	(s.e.)
	(1)		(2)		(3)	
Officer	-0.0856***	(0.0283)				
Age at 15 years of service	-0.0170***	(0.0014)	-0.0164***	(0.0015)	-0.0108***	(0.0024)
Salary at retirement (yearly, $10k)	-0.0384***	(0.0045)	-0.0350***	(0.0047)	-0.0321***	(0.0066)
Break-even discount rate	-5.2492***	(0.3540)	-4.9482***	(0.3802)	-3.2014***	(0.4667)
Army	-0.0333***	(0.0098)	-0.0166	(0.0128)	-0.0288	(0.0220)
Marines	0.0643***	(0.0172)	0.0681***	(0.0196)	0.0084	(0.0311)
Navy	0.0347***	(0.0095)	0.0543***	(0.0122)	-0.0123	(0.0243)
Combat intensive occupation	0.0403***	(0.0117)	0.0427***	(0.0118)	-0.0525**	(0.0232)
Male	0.0324***	(0.0116)	0.0341***	(0.0120)	0.0161	(0.0219)
Black	0.0882***	(0.0085)	0.0996***	(0.0090)	-0.0043	(0.0241)
Asian	0.0001	(0.0176)	0.0057	(0.0180)	0.0237	(0.0648)
Other race	0.0274*	(0.0152)	0.0352**	(0.0155)	-0.0176	(0.0300)
Single	-0.0364***	(0.0136)	-0.0422***	(0.0140)	-0.0080	(0.0260)
Divorced	0.0586***	(0.0150)	0.0528***	(0.0151)	0.1267*	(0.0647)
Has dependents	0.0140	(0.0150)	0.0142	(0.0153)	-0.0275	(0.0402)
Number of dependents	0.0358***	(0.0031)	0.0357***	(0.0031)	0.0199***	(0.0065)
AFQT score			0.0007***	(0.0002)		
Graduate degree	-0.0238	(0.0331)	0.0140	(0.0527)	0.0037	(0.0272)
College degree	-0.0394***	(0.0096)	-0.0402***	(0.0099)	-0.0296	(0.0211)
Made choice in 2002	-0.0277***	(0.0101)	-0.0290***	(0.0102)	0.0016	(0.0241)
Observations	21,516		20,221		1,295	

Notes: *** p<0.01, ** p<0.05, * p<0.1

(1) Sample only includes individuals who retired in 2001 or 2002. Standard errors in parentheses.

(2) Omitted categories are: Air Force, White, married, high school degree, and made the choice in 2001.

(3) An indicator variable is included in the enlisted regression to control for the observations mising an AFQT score.

Table 7: Estimated personal discount rates.

	All	Enlisted Personnel	Officers
Entire sample	9.21%	10.05%	6.49%
Male	9.51%	10.29%	6.74%
Female	7.17%	8.33%	5.32%
White	8.01%	9.01%	6.14%
Black	12.40%	12.84%	9.09%
Asian	6.58%	6.37%	6.68%
Single	6.29%	6.71%	5.21%
Married	9.52%	10.45%	6.60%
Divorced	10.41%	11.01%	7.82%
0 - 3 dependents	8.37%	9.11%	6.07%
> 3 dependents	11.67%	12.82%	7.79%
< 34 years old	10.91%	10.84%	10.33%
34 - 37 years old	10.20%	10.40%	8.03%
38 - 41 years old	6.42%	8.57%	6.11%
41 - 44 years old	5.32%	7.17%	5.12%
> 44 years old	2.10%	4.89%	2.56%
Army	10.17%	11.12%	6.29%
Navy	8.77%	9.10%	5.99%
Marine Corps	9.76%	11.24%	8.70%
Air Force	8.66%	9.93%	6.00%
Combat Intensive Occupation	11.10%	11.50%	6.18%
Other	8.98%	9.87%	6.51%
High School	10.65%	10.47%	11.00%
College degree	6.89%	8.28%	6.71%
Graduate degree	-1.45%	7.25%	5.55%