2019-03

BLENDED RETIREMENT SYSTEM OPT-IN DECISIONS: A BEHAVIORAL ECONOMICS ANALYSIS

Brockert, Nicholas D.

Monterey, CA; Naval Postgraduate School

NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

BLENDED RETIREMENT SYSTEM OPT-IN DECISIONS: A BEHAVIORAL ECONOMICS ANALYSIS

by

Nicholas D. Brockert

March 2019

Thesis Advisor: Marigee Bacolod
Co-Advisor: Jesse Cunha

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			*Form Approved OMB No. 0704-0188*

1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** March 2019	**3. REPORT TYPE AND DATES COVERED** Master's thesis

4. TITLE AND SUBTITLE BLENDED RETIREMENT SYSTEM OPT-IN DECISIONS: A BEHAVIORAL ECONOMICS ANALYSIS	**5. FUNDING NUMBERS**
6. AUTHOR(S) Nicholas D. Brockert	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000	**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A	**10. SPONSORING / MONITORING AGENCY REPORT NUMBER**

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.	**12b. DISTRIBUTION CODE** A

13. ABSTRACT (maximum 200 words)

Modernization of the military retirement system, beginning in 2018, left many Marines with an important decision to make about their futures. They were allowed 12 months to choose whether it was in their best interest to opt into the new Blended Retirement System (BRS), or to remain under the legacy High-3 retirement plan. By analyzing their choices through the lens of behavioral economics, the primary goal of my research is to determine if Marines made rational or irrational retirement savings decisions. By the end of 2018, 49 percent of eligible Marines opted into the BRS, 28 percent opted out of the BRS, and 23 percent failed to register a decision via Marine Online, making a passive choice for the status quo. I find significant variation in the timing of Marines' opt-in decisions, and those with lower years of service, who are younger, and more cognitively able are more likely to have opted in. Using a Linear Probability Model, I also find life events such as a change in the number of dependents, promotion, and re-enlistment to be significant determinants of their choices. Lastly, I provide summary statistics on their Thrift Savings Plan contribution percentages. Through analysis of this information, I find some evidence that Marines may have demonstrated irrational behavior with regard to their retirement decision making, suggesting that some pundits' predictions prior to the opt-in period were overly optimistic.

14. SUBJECT TERMS Blended Retirement System, military retirement, behavioral economics, nudge theory, continuation pay	**15. NUMBER OF PAGES** 65
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	**18. SECURITY CLASSIFICATION OF THIS PAGE**	**19. SECURITY CLASSIFICATION OF ABSTRACT**	**20. LIMITATION OF ABSTRACT**
Unclassified	Unclassified	Unclassified	UU

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89) Prescribed by ANSI Std. 239-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release. Distribution is unlimited.

BLENDED RETIREMENT SYSTEM OPT-IN DECISIONS: A BEHAVIORAL ECONOMICS ANALYSIS

Nicholas D. Brockert
Captain, United States Marine Corps
BS, U.S. Naval Academy, 2009
MA, Marshall University, 2016

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
March 2019

Approved by: Marigee Bacolod
Advisor

Jesse Cunha
Co-Advisor

Latika Hartmann
Academic Associate, Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

Modernization of the military retirement system, beginning in 2018, left many Marines with an important decision to make about their futures. They were allowed 12 months to choose whether it was in their best interest to opt into the new Blended Retirement System (BRS), or to remain under the legacy High-3 retirement plan. By analyzing their choices through the lens of behavioral economics, the primary goal of my research is to determine if Marines made rational or irrational retirement savings decisions. By the end of 2018, 49 percent of eligible Marines opted into the BRS, 28 percent opted out of the BRS, and 23 percent failed to register a decision via Marine Online, making a passive choice for the status quo. I find significant variation in the timing of Marines' opt-in decisions, and those with lower years of service, who are younger, and more cognitively able are more likely to have opted in. Using a Linear Probability Model, I also find life events such as a change in the number of dependents, promotion, and re-enlistment to be significant determinants of their choices. Lastly, I provide summary statistics on their Thrift Savings Plan contribution percentages. Through analysis of this information, I find some evidence that Marines may have demonstrated irrational behavior with regard to their retirement decision making, suggesting that some pundits' predictions prior to the opt-in period were overly optimistic.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

BRS	Blended Retirement System
CP	Continuation Pay
DoD	Department of Defense
High-3	average of highest 3 years of base pay
MOS	Military Occupational Specialty
NDAA	National Defense Authorization Act
REDUX	Military Reform Act of 1986
TFDW	Total Force Data Warehouse
TSP	Thrift Savings Plan
USMC	United States Marine Corps
YOS	years of service

THIS PAGE INTENTIONALLY LEFT BLANK

EXECUTIVE SUMMARY

Introduction

In Fiscal Year 2016, approximately $57 billion was paid to 2.3 million military retirees and survivors (Department of Defense Office of the Actuary, 2017). Retirement payments under the legacy High-3 system were ballooning and Congress needed to adopt a new retirement plan to curb the cost. Modernization of the military retirement system, beginning in 2018, left many Marines with an important decision to make about their futures. They were allowed 12 months to choose whether it was in their best interest to opt-in to the new Blended Retirement System (BRS), or to remain under the legacy High-3 retirement plan. By analyzing their choices through the lens of behavioral economics, the primary goal of this research is to determine if Marines made rational or irrational retirement savings decisions. A secondary goal is to determine who was more likely to opt-in to the BRS and the role life changes played in their choices.

To determine whether behavioral economics theories influenced their opt-in decisions, I analyze Total Force Data Warehouse (TFDW) and Operational Data Store Enterprise (ODSE) data on all Active Duty Marines who met the opt-in eligibility requirement. The data identifies whether or not a Marine decided to opt-in to the BRS, along with a snapshot of their information at the end of each month. This allows me to analyze the effect that life-changes, such as marriage, childbirth, or promotion, have on their retirement decisions. The dataset also includes demographic data (race, gender, age, rank, AFQT score, MOS, etc.), which allows me to identify differences in BRS opt-in rates across groups with similar observable characteristics.

BRS Eligibility Categories

There are three categories of servicemembers with regard to BRS eligibility. The first category is comprised of servicemembers who joined the military on January 1, 2018, or later; they were automatically enrolled in the BRS. The second category is comprised of servicemembers with 12 or more years of service (YOS) as of December 31, 2017; they

were automatically grandfathered under the legacy High-3 retirement system. The third and final category is comprised of servicemembers with less than 12 YOS as of December 31, 2017; they were provided the option of enrolling in the BRS or remaining under the legacy High-3 plan. My research is concerned with this third category of servicemembers.

High-3, CSB/REDUX, and BRS

High-3 is a cliff-vesting retirement plan, meaning that servicemembers are not vested until they serve for 20 years. If they do not reach 20 YOS, they do not receive a pension (with some exceptions). The High-3 defined-benefit pension is calculated at 2.5 percent of a servicemember's highest three years of base pay multiplied by their number of years served (i.e., 2.5% × 20 YOS = 50% of base pay). Until December 31, 2017, servicemembers were given the option of receiving a $30,000 Career Status Bonus (CSB) upon reaching 15 YOS if they agreed to take a reduced defined-benefit pension (REDUX). Per Marine Corps Administrative Message (MARADMIN) 210/17, the National Defense Authorization Act (NDAA) for Fiscal Year 2016 discontinued CSB/Redux and introduced the BRS.

The BRS combines a defined-benefit pension with a defined-contribution. It also includes a mid-career Continuation Pay (CP) bonus and a lump-sum option. The BRS defined-benefit pension is calculated at 2.0 percent of a servicemember's highest three years of base pay multiplied by their number of years served (i.e., 2.0% × 20 YOS = 40% of base pay). The BRS defined-contribution is handled under the servicemember's Thrift Savings Plan (TSP) retirement account. Upon a servicemember reaching 60 days of service, the DoD automatically contributes an amount equal to 1 percent of the servicemember's base pay into their TSP account. Upon a servicemember reaching 3 YOS, the DoD will begin matching their contributions up to a maximum of 5 percent. The one-time mid-career CP bonus policy is service branch specific. Per MARADMIN 575/17, Marine enlisted and officer's that chose BRS are eligible to receive the CP bonus upon reaching 12 YOS if they agree to serve four additional years. If they agree to this extension of active duty, they receive a CP bonus calculated at 2.5 times their monthly base pay (i.e., in 2018, an E-6 with 12 YOS would receive 2.5 × $3776.70 = $9441.75). The final

aspect of the BRS that differs from the legacy High-3 plan is the lump-sum option at retirement. Servicemembers can take a lump-sum payment equal to 25% or 50% of their full annuity calculated from their retirement date until age 67, with the rest of the annuity paid in monthly payments. Upon reaching age 67, their full annuity is reinstated. Asch et al. (2017) provided the following chart to summarize the options Marines must consider (Table 1).

Table 1. Legacy (High-3) vs. BRS. Source: Asch et al. (2017).

Plan Element	Legacy	BRS
Defined-benefit vesting	20 years	20 years
Defined-benefit multiplier	2.5%	2.0%
Defined-benefit payment working years		Full annuity or lump-sum option (50% or 25%); RC lump-sum based on annuity from age 60 to retirement age
Defined-contribution agency contribution rate		1% automatic; plus up to 4% matching (max = 5%)
Defined-contribution rate YOS		1%: entry + 60 days until 26 YOS Matching: start of 3 YOS–26 YOS
Defined-contribution member contribution rate		3% automatic; full match requires 5% contribution
Defined-contribution vesting		Start of YOS 3
Continuation pay multiplier (months of basic pay)		Minimum 2.5 for AC, 0.5 RC; with additional amount varying
Continuation pay YOS/additional obligation		At 12 YOS with 4-year additional obligation
Opt-in		Must be serving on 1/1/2018 and have less than 12 YOS as of 12/31/17; opt-in period is 1/1/18–12/31/2018

Note. RC is “Reserve Component,” AC is “Active Component,” YOS is “Years of Service.”

The Information Campaign

A great deal of time and effort were spent to provide Marines with the information they needed in order to make an informed retirement plan decision. The BRS website was crowded with information from pamphlets to videos to retirement calculators. Marine Online had an opt-in reminder on its homepage, visible every time a Marine logged-in. Mandatory computer-based training was rolled out. Several MARADMINs were released addressing the opt-in decision. Personal Financial Managers were made available. YouTube videos were posted online. The list of information is nearly endless. However,

regardless of all the information provided to Marines about the decision to opt-in to the BRS, the Marine Corps Manpower and Reserve Affairs (M&RA) Branch is concerned that some Marines may not have made the optimal decision. In some cases, they may have mistakenly accepted the default of remaining under the legacy High-3 retirement system by failing to register a decision via Marine Online.

Irrational Decisions

The rational decision according to standard economic theory would be for Marines to optimize their retirement savings by choosing the plan that solves their lifetime consumption-smoothing problem, especially when matching is offered (Thaler & Benartzi, 2004). The BRS calculator provided a comparison of what a Marine's retirement savings would look like under each plan. This comparison was supposed to aid Marines in making a rational decision, but the actual data suggests otherwise. The potentially irrational decisions of most concern are those made by Marines with more than 10 years of service. M&RA is curious to know why these Marines opted-in to BRS after the BRS calculator demonstrated it was more beneficial for them to stay under the legacy High-3 plan.

Utilizing behavioral economics theory, Thaler and Benartzi (2004) offer three potential reasons for why people make irrational decisions with regard to retirement savings, which may be beneficial in my research. First, calculating the optimal amount is very difficult. The BRS calculators can only provide a best guess based on the information the Marine inputs. The Marine can then accept that as a good estimate or discard it. Second, self-control plays a huge role in retirement savings behavior. In a study on servicemember's decisions about High-3 and CSB/REDUX, Simon, Warner, and Pleeter (2015) found that the degree of patience, as measured by Personal Discount Rates (PDRs), played a large role in whether someone took the CSB even though it was not optimal. Due to high PDRs, Marines with over 10 years of service may have opted-in to the BRS to earn matching contributions immediately and the CP bonus in the near future. The third potential reason that could explain irrational retirement decisions is procrastination, or what Thaler and Benartzi refer to as "status quo bias." My data, showing a large spike in decisions in December, leads me to believe procrastination was involved and status quo

bias may have led to many Marines not receiving the benefit of TSP matching contributions throughout the year.

Data Analysis

I present summary statistics of the decisions Marines made during the opt-in period, both for the eligible population as a whole and separately for enlisted Marines and officers. The statistics provide insight on the percentage of Marines who registered or failed to register each decision on Marine Online, the distribution across each month, the distribution across years of service cohorts, the distribution across age, and the distribution across GCT scores.

Next, I estimate a Linear Probability Model to identify the correlation between opting-in, demographic data, and life/career events. The key independent variables consist of changes in number of dependents, re-enlistment, promotion, gender, age, rank group, race, and cognitive ability. GCT score was used as a measure of cognitive ability because a score was available for every Marine in my dataset. Ranks were grouped to identify differences between junior Marines, non-commissioned officers, staff non-commissioned officers, warrant officers, company grade officers, and field grade officers. The dependent variable was whether or not a Marine opted-in to the BRS. Regressions were run for both enlisted and officers to display overall results and then again to display monthly results.

Key Results

Figure 1 displays the proportion of all eligible Marines that made or failed to make the choice between opting-in or opting-out of the BRS. As the pie chart shows, a little less than half of all eligible Marines opted-in to the BRS, slightly more than a quarter opted-out, and almost a quarter failed to register a choice via Marine Online.

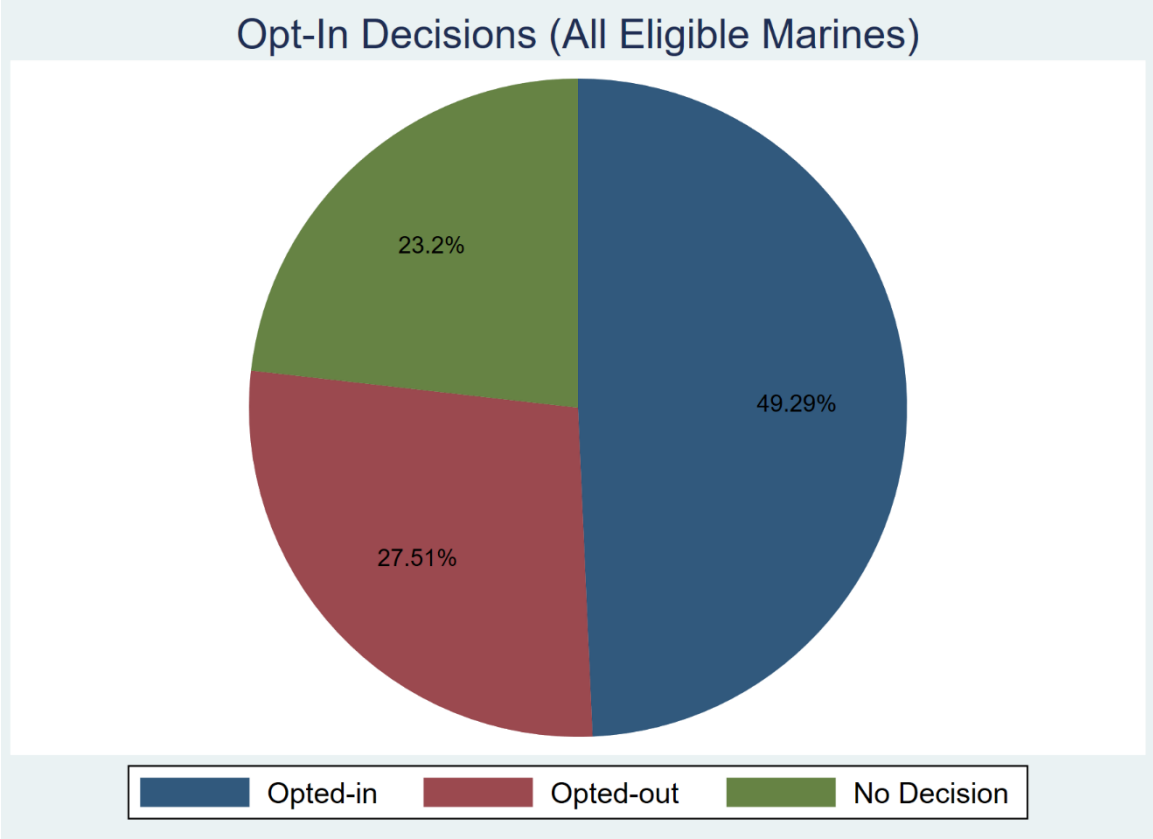

Figure 1. Opt-in Decisions: All Eligible Marines

Figure 2 displays the percentage of enlisted Marines who opted-in and the years of service cohort they belong to. Figure 3 displays the same information for officers. If a Marine was in the service for less than one year at the time of registering his/her decision, they were counted as years of service cohort zero. It is interesting to note that hundreds of Marines with over 10 years of service decided to opt-in to the BRS even though these Marines are often considered careerists.

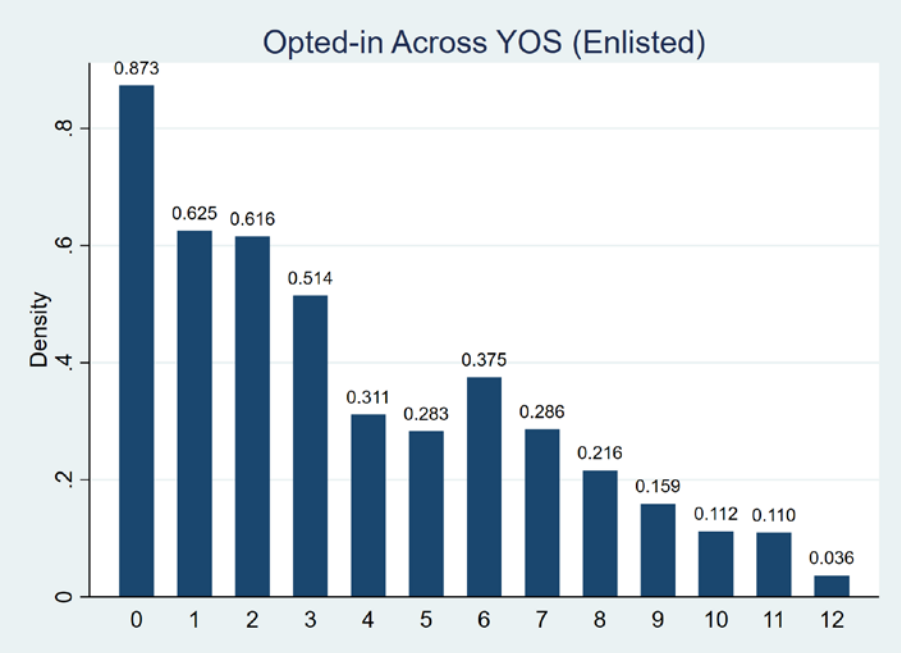

Figure 2. Opted in across YOS Distribution: Enlisted

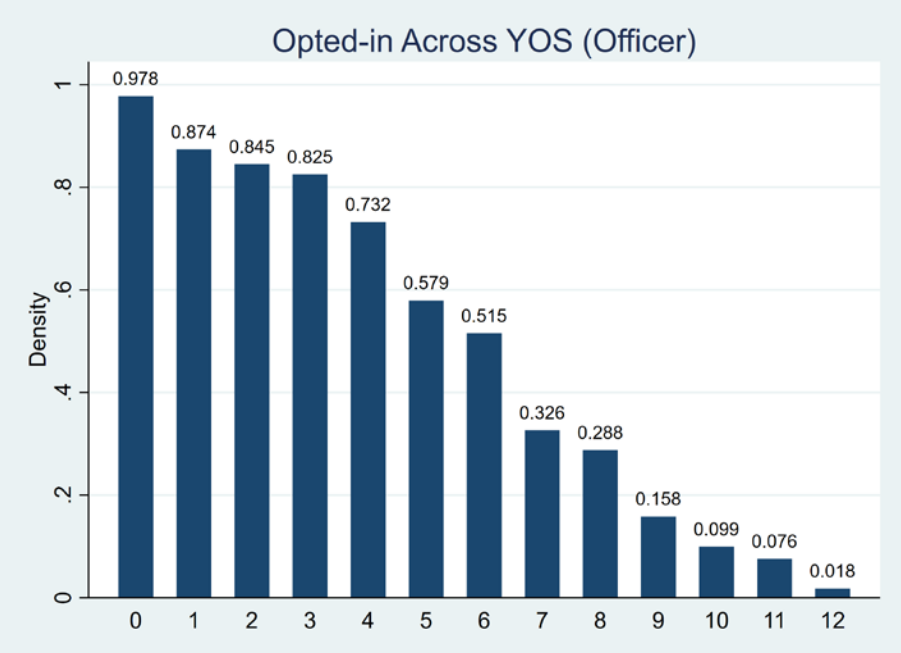

Figure 3. Opted in across YOS Distribution: Officer

Figure 4 displays the age distribution of the Marines who opted-in to the BRS. Of the Marines who opted-in, younger Marines made up a larger proportion than older Marines. This seems rational if we consider that the closer a Marine gets to retirement age, the less beneficial it is to opt-in.

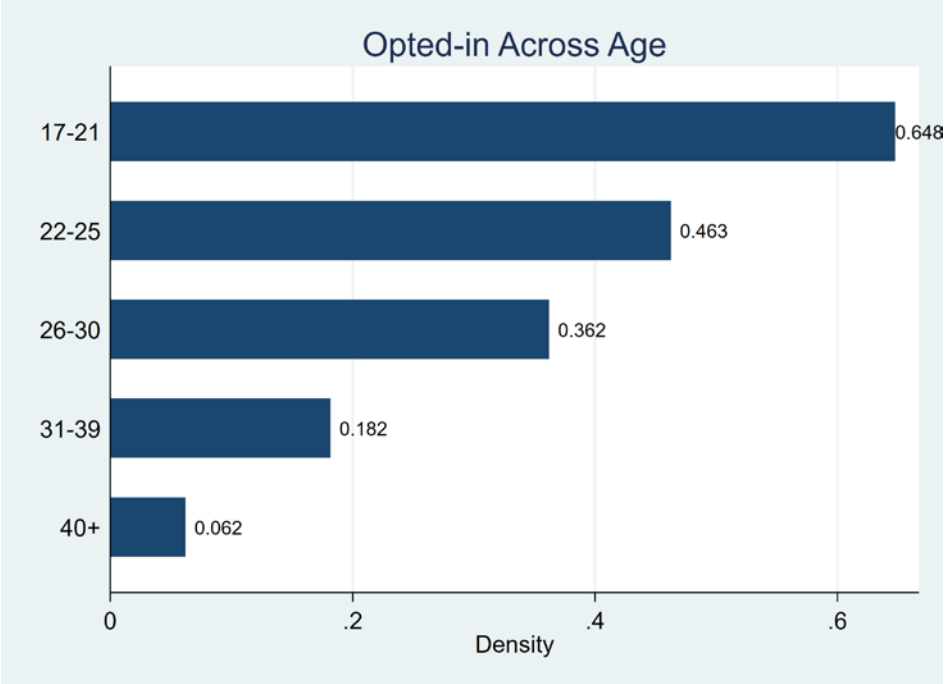

Figure 4. Opted in across Age Distribution

Recommendations

The BRS opt-in period provides a unique opportunity to analyze the retirement decisions of a large population of service members. Although I focus solely on the decisions of members of the Marine Corps, there is a great deal more research that can and should be conducted across all military branches. Analyzing the Marine Corps is interesting from a behavioral economics viewpoint because the Marine Corps is the only branch to mandate that an opt-in/opt-out decision be made. The rest of the military branches still launched an information campaign, but there was no formal nudge to make a decision. A comparison of opt-in rates across all branches of the military would thus be informative to see if the USMC nudge worked differently.

References

Asch, B. J., Mattock, M. J., & Hosek, J. (2017). "The Blended Retirement System: retention effects and continuation pay cost estimates for the armed services." Retrieved from https://www.rand.org/pubs/research_reports/RR1887.html

Department of Defense Office of the Actuary. (2017). FY2016 DoD statistical report on the military retirement system. Retrieved from https://actuary.defense.gov/Portals/15/Documents/MRS_StatRpt_2016%20v4%20FINAL.pdf?ver=2017-07-31-104724-430

MARADMIN 210/17 (2017a). "Discontinuation of Career Status Bonus and REDUX retirement plan." Retrieved from https://www.marines.mil/News/Messages/MARADMINS/Article/1167291/discontinuation-of-career-status-bonus-and-redux-retirement-plan/

MARADMIN 575/17 (2017b). "Continuation Pay Program for CY18 for Blended Retirement System (BRS) participants." Retrieved from https://www.marines.mil/DesktopModules/ArticleCS/Print.aspx?PortalId=59&ModuleId=46529&Article=1343484

Simon, C. J., Warner, J. T., & Pleeter, S. (2015). Discounting, cognition, and financial awareness: New evidence from a change in the military retirement system. *Economic Inquiry, 53*(1), 318–334. Retrieved from http://libproxy.nps.edu/login?url=https://search.proquest.com/docview/1684406702?accountid=12702

Thaler, R. H., & Benartzi, S. (2004). Save more tomorrow: Using behavioral economics to increase employee Saving. *Journal of Political Economy*, *112*(1), S164–S187. Retrieved from http://libproxy.nps.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=12603985&site=ehost-live&scope=site

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

I would like to thank my wife, Emily, for her patience throughout the thesis writing process. I could not have completed on time without your love and support. Thank you for all that you do to keep me sane.

I would like to thank Dr. Michael Strobl for suggesting the topic that sparked my curiosity in this project. I would also like to thank Gary Lindeen for his patience and help in obtaining all of the data that went into my research.

Lastly, I would like to thank my advisors, Dr. Marigee Bacolod and Dr. Jesse Cunha. I cannot emphasize enough how much your continuous support throughout this process has contributed to my learning experience at NPS. I am extremely grateful for the advice you provided and the effort you put in to get me across the finish line.

THIS PAGE INTENTIONALLY LEFT BLANK

I. BACKGROUND

A. PREVIOUS DOD RETIREMENT PLANS

Prior to 1986, the U.S. military offered a 20-year cliff-vesting retirement pension plan known as the High-3 retirement plan. Under the High-3 retirement plan, members of the military who completed 20 or more years of service received a pension calculated at 2.5 percent of their highest three years of Basic Pay multiplied by their number of years of service (i.e., 2.5% × 20 YOS = 50% Basic Pay). In 1986, the DoD implemented a new retirement plan known as REDUX in an effort to reduce the ballooning costs of retirement payments. Under REDUX, members of the military who completed 20 or more years of service received a pension calculated at 2 percent of their highest three years of Basic Pay multiplied by their number of years of service (i.e., 2% × 20 YOS = 40% Basic Pay). As noted by Kamarck (2018), this system was viewed unfavorably and had a negative impact on servicemember retention. In Fiscal Year 2000, before any service members retired under the REDUX plan, the retirement system was changed yet again, now providing servicemembers with a choice between two retirement options. Servicemembers had to choose between option 1, staying with the REDUX plan and receiving a $30,000 Career Status Bonus upon reaching 15 years of service, or option 2, enrolling in the High-3 retirement plan. This two-option system remained in place until the Blended Retirement System replaced it on January 1, 2018.

B. BLENDED RETIREMENT SYSTEM

The National Defense Authorization Act (NDAA) for Fiscal Year 2016 radically reformed the military retirement system by establishing a new plan, known as the Blended Retirement System (BRS). The BRS is a combination of a 20-year cliff-vesting retirement pension, a defined-contribution via the Thrift Savings Plan, and a mid-career Continuation Pay incentive. On January 1, 2018, the DoD began transitioning to this plan. The transition was undertaken for two main reasons: 1) to save the DoD money on future retirement payments, and 2) to increase the number of servicemembers who receive retirement

benefits. Table 1 from Asch et al. (2017) compares the BRS to the legacy High-3 retirement plan.

Table 1. Legacy (High-3) vs. BRS. Source: Asch et al. (2017).

Plan Element	Legacy	BRS
Defined-benefit vesting	20 years	20 years
Defined-benefit multiplier	2.5%	2.0%
Defined-benefit payment working years		Full annuity or lump-sum option (50% or 25%); RC lump-sum based on annuity from age 60 to retirement age
Defined-contribution agency contribution rate		1% automatic; plus up to 4% matching (max = 5%)
Defined-contribution rate YOS		1%: entry + 60 days until 26 YOS Matching: start of 3 YOS–26 YOS
Defined-contribution member contribution rate		3% automatic; full match requires 5% contribution
Defined-contribution vesting		Start of YOS 3
Continuation pay multiplier (months of basic pay)		Minimum 2.5 for AC, 0.5 RC; with additional amount varying
Continuation pay YOS/additional obligation		At 12 YOS with 4-year additional obligation
Opt-in		Must be serving on 1/1/2018 and have less than 12 YOS as of 12/31/17; opt-in period is 1/1/18–12/31/2018

Note. RC is "Reserve Component," AC is "Active Component," YOS is "Years of Service"

1. BRS Eligibility Categories

There are three categories of servicemembers regarding BRS eligibility. The first category is comprised of servicemembers who joined the military on January 1, 2018 or later; they were automatically enrolled in the BRS. The second category is comprised of servicemembers with twelve or more years of service as of December 31, 2017; they were automatically grandfathered under the legacy High-3 retirement system. The third and final category is comprised of servicemembers with less than 12 years of service as of December 31, 2017; they were provided the option of enrolling in the BRS or remaining under the legacy High-3 retirement plan. It is this third category of servicemembers that my research is concerned with.

2. Retirement Pension Changes

The new 20-year cliff-vesting retirement pension portion of the BRS is calculated in the same way the Redux plan was previously. The BRS reduces the calculated 2.5% Basic Pay per year of service to 2% (i.e., a 20-year retirement pension is now equal to 40% of Basic Pay, relative to 50% previously). This 0.5% reduction in the formula is how the Department of Defense plans to curb the rising costs of retirement payments. The BRS also includes a Lump-Sum Retirement Option. Servicemembers can receive a one-time payment of 25% or 50% of their annuity in exchange for a reduced monthly annuity payment until age 67. Upon reaching age 67, the full-annuity is restored.

3. Thrift Savings Plan Defined-Contribution

To avoid the same servicemember retention issues experienced under the Redux plan, additional benefits were added to the BRS. One such addition, was the inclusion of a defined-contribution via the Thrift Savings Plan (TSP). The TSP is an investment account similar to a private sector 401(k) or Roth 401(k). All servicemembers are automatically enrolled in the TSP upon joining the military. Under the BRS, once a servicemember reaches 60 days of service the Department of Defense automatically contributes an amount equal to 1% of the servicemembers' monthly Basic Pay into their TSP account each month. Upon a servicemember reaching 3 years of service, the Department of Defense begins matching the servicemembers' TSP contributions up to an additional 4% of monthly Basic Pay. This brings the total Department of Defense contribution to 5% of monthly Basic Pay if the servicemember fully utilizes matching. Department of Defense contribution matching ends upon completion of 26 years of service.

4. Continuation Pay

The BRS also includes a one-time mid-career incentive pay, known as Continuation Pay. The minimum Continuation Pay incentive, set by the National Defense Authorization Act (NDAA) is 2.5 times monthly Basic Pay. Each branch of the military has the flexibility to adjust their Continuation Pay incentive up to 13 times monthly Basic Pay. The Marine Corps' Continuation Pay policy is to pay the minimum (i.e., 2.5 times monthly Basic Pay). The NDAA for Fiscal Year 2016 set the eligibility criteria for Continuation Pay to be paid

upon reaching 12 years of service. That requirement has since been amended to 8 years of service by the NDAA for Fiscal Year 2017. It also amended the number of years a servicemember must obligate to receive the Continuation Pay incentive from a minimum of 4 additional years of service to 3 additional years of service.

C. OPT-IN PERIOD

As previously mentioned, servicemembers with less than 12 years of service as of December 31, 2017 were provided the option of enrolling in the BRS or remaining under the legacy High-3 retirement plan. The default was to remain under the legacy High-3 retirement plan. The opt-in period lasted 12 months, beginning on January 1, 2018 and ending on December 31, 2018. A decision to opt-in was irrevocable.

1. Information Campaign

An extensive information campaign was conducted to ensure eligible servicemembers were well-informed of their options. The BRS website included a wealth of resources. There were fact sheets, videos, comparison calculators, social media links, policy documents, news articles, and training materials. The Marine Corps made it mandatory for eligible Marines to elect one of the two retirement systems via the Marine Online website (mol.usmc.mil). Marine Online is frequently accessed by Marines for administrative purposes and it had an opt-in reminder on its home screen every time a Marine logged-in (see Figure 1). Mandatory computer-based training was implemented for eligible servicemembers as well as their leaders. Personal Financial Managers were made available to anyone who wished to speak with them. The list of information and resources is nearly endless.

2. DoD-Sponsored BRS Calculator

The Department of Defense developed a comparison calculator to help servicemembers make an informed decision. The BRS comparison calculator provided a best guess of what servicemembers' expected savings portfolio would look like under the new system. Then, it compared it to what they could expect under the legacy High-3 retirement system. These calculations were based on 12 data fields and the results differ

depending on selections. Servicemembers were encouraged to run the calculator multiple times and make different selections to come up with a realistic comparison of the two retirement systems. With a large amount of variance, the accuracy of the calculations is questionable. Furthermore, the calculator came with a disclaimer stating it was provided for information purposes only and not intended to be used as an investment advisory tool.

3. MARADMINs

Several Marine Administrative Messages (MARADMINs) were released addressing the opt-in decision requirement. Each gave an estimate of how many Marines had yet to register a decision via Marine Online, provided an opt-in deadline reminder, and provided a resource reminder.

THIS PAGE INTENTIONALLY LEFT BLANK

II. LITERATURE REVIEW

A. RATIONAL RETIREMENT SAVINGS THEORY

Since the early 1960s, the Life Cycle Hypothesis (LCH) of savings has been the standard economic theory for rational retirement savings. Franco Modigliani, a Nobel Laureate and originator of the LCH, stated that the purpose of the LCH was, "to show that all the well-established empirical regularities could be accounted for in terms of rational, utility-maximizing, consumers allocating optimally their resources to consumption over their life" (Modigliani, 1986). In other words, he viewed retirement savings as an optimization problem that could be solved by balancing wealth, life expectancy, and consumption. Modigliani emphasized the need for substantial rationality and self-control to save for retirement consumption. He claimed individual wealth peaks between age 60 and 65 and then declines due to retirement consumption needs. Consumption is smoothed to coincide with reduced income and use of acquired savings during retirement years. The LCH is an optimistic view that individuals are saving rationally. Modigliani used empirical evidence from the early 1980s to refute any claim that individuals were saving irrationally.

B. IRRATIONAL RETIREMENT SAVINGS THEORY

Recent Nobel Laureate Richard Thaler subscribes to a less optimistic view of individuals' retirement savings behavior. As a behavioral economist, he believes that individuals make irrational decisions about saving. Thaler and Benartzi (2004) offer three potential reasons why people make irrational decisions with regards to retirement savings. First, they claim calculating the optimal amount is very difficult. Second, like Modigliani, they argue that self-control plays a vital role in retirement savings behavior. Third, they claim procrastination, or what they refer to a status quo bias, prevents individuals from saving optimally (Thaler & Benartzi, 2004).

Thaler and Benartzi (2004) offer a prescription for counteracting these potential savings pitfalls by utilizing a method known as Nudge Theory. The premise behind Nudge Theory is that small changes in the way information and options are presented can largely

influence the decisions people make. The way they are presented is called choice architecture and these "nudges" can have intended and unintended consequences. One such nudge that has had a tremendous influence on retirement savings behavior in the United States is automatic enrollment in 401(k)s. By making enrollment automatic, the procrastination pitfall is avoided because individuals stick with the status quo. There is of course the option of disenrolling from a 401(k), but the status quo bias leads to more people staying enrolled, which ultimately leads to more saving.

As self-proclaimed Libertarian Paternalists, Thaler and Sunstein (2003) believe that if no coercion is involved, some types of paternalism should be acceptable. They view policies as paternalistic when the policies have, "the goal of influencing the choices of other parties in a way that will make those parties better off." Understanding the role of bounded rationality in decision making, they know that individuals would make optimal choices if they had complete information, unlimited cognitive abilities, and no lack of willpower; but that is never the case. In reality, people make less-than-optimal choices because they are lacking in all three categories. The best that choice architects can do is to develop options that mitigate these shortfalls. My research will use the lens of behavioral economics through which to view military retirement reform and analyze how well Marine Admin communication regarding the BRS affected opt-in behavior.

C. EVIDENCE IN SUPPORT OF IRRATIONAL DECISION MAKING

1. Pensions and Intertemporal Choice

Cunha and Menichini (2014) analyzed the retirement plan decisions of nearly 90,000 servicemembers that were offered the choice between the High-3 and Redux retirement plan in order to determine if optimal decisions were being made. They compared the present value of retirement payments of each plan and found that even when they factored in the $30,000 lump-sum Career Status Bonus servicemembers received under Redux, the present value of High-3 was significantly higher than that of Redux. Their study revealed that despite high break-even discount rates, more than 40% of servicemembers offered Redux chose to take it. It is noted, however, that as break-even discount rates

increased, the likelihood of choosing Redux decreased. The authors attribute this to servicemembers making more informed decisions.

Cunha and Menichini also provide evidence on who is more likely to choose Redux over High-3 and can estimate personal discount rates (defined as the rate at which individuals are willing to exchange future for current consumption) of servicemembers. They found that servicemembers were more likely to select REDUX if they were enlisted, non-white, divorced, in the Marine Corps, or had more dependents. They calculated servicemembers' personal discount rates at 9.2% overall, 10.1% for enlisted, and 6.5% for officers. By offering a choice between High-3 and Redux, they argue that the U.S. government saved over $2 billion in future retirement payments. We are now seeing a similar attempt at budget reduction with the BRS.

2. Discounting, Cognition, and Financial Awareness

Simon, Warner, and Pleeter (2015) analyzed the retirement plan decisions of 13,461 active duty personnel (12,025 enlisted and 1,436 officers) eligible to receive the Redux Career Status Bonus. They aimed to determine if servicemembers' personal discount rates were related to their underlying degrees of patience. From their study, they were able to estimate servicemembers' personal discount rates and determine the effects of cognitive ability and financial literacy on their choices. Similar to Cunha and Menichini (2014), Simon et al. used the break-even discount rate to find the present value of High-3 and Redux and found similar results. They calculated servicemembers' personal discount rates at 7.2% for enlisted and 4.3% for officers.

Simon et al. (2015) were more focused on how cognitive ability affected a servicemembers' choice between High-3 and Redux. They found that cognitively more able servicemembers were more patient (i.e., less likely to choose Redux). Cognitive ability was measured using AFQT scores and educational attainment, so officers were typically more cognitively able. They were also concerned with how being better informed affected a servicemembers' choice between High-3 and Redux. Their study found that better informed servicemembers were not always more patient. Better informed servicemembers were susceptible to confirmation bias, in which they would only acquire information that

was consistent with their behavioral preferences of patience or impatience and their decision to either take Redux or High-3. The current high returns on the Thrift Savings Plan and good economy may be a contributing factor for impatient servicemembers opting-in to the BRS for fear of missing out on the opportunity to invest.

3. Retention Effects of High Years of Service Cliff-Vesting Pension Plans

Cunha, Menichini, and Crockett (2015) analyzed the Australian Defense Force's 1991 decision to replace a 20-year cliff-vesting retirement scheme with a one-year vesting scheme. Similar to the BRS, a contributing factor for the change was that servicemembers viewed the cliff-vesting as unfair. With a few exceptions, unless service members reached 20 years of service, they received no retirement benefits. The Cunha et al. compared one year of opt-in eligible (FY91 cohort) to one year of auto-enrolled (FY92 cohort). They found that officers and female servicemembers were more likely to opt-in to the new system. Officers were more likely to opt-in because the present value of the new system was greater for those staying in service for 25 years or more, and officers were more likely to serve that long. Females were more likely to opt-in because the defined contribution allowed them to leave service with retirement savings, and females were more likely to leave service to bear and raise children.

Similar to the U.S. military separation rates, ADF separation rates were high until approximately 10 years of service. Removal of the 20-year cliff-vesting had negative effects for the force as a whole. For every year prior to 20 years of service, the ADF experienced increased separation rates. Most significant was that separation probability was extremely small around 15 years of service under the legacy system, but not so under the new system. Cunha et al. referred to this as the "lock-in effect" of the 20-year cliff-vesting requirement. Without the "lock-in effect" of the 20-year cliff-vesting requirement, servicemembers were free to leave without much of a loss in retirement benefits (2015). This is a good lesson for the U.S. military, and I believe it is the reason for keeping the 20-year cliff-vesting aspect as part of the BRS.

III. DATA AND METHODOLOGY

A. DESCRIPTION OF DATA

The data utilized for this study is provided by Marine Corps Manpower and Reserve Affairs (M&RA), and was retrieved from Total Force Data Warehouse (TFDW) and Operational Data Store Enterprise (ODSE). Five datasets were provided, but only four were used. There is a dataset for each of the following: BRS data, education level data, demographic data, test score data, and Thrift Savings Plan data. The education level dataset was omitted because there were too few observations. After removing duplicate observations, these datasets were merged into a dataset which includes monthly observations on 166,513 Active Duty Marines in 2018. This is the population of Active Duty Marines who were eligible to opt-in to the BRS between January 1, 2018 and December 31, 2018. I utilized the demographic data as the master dataset because it was longitudinal monthly data from 2018, whereas the other datasets were a snapshot of either December 31, 2017 or December 31, 2018.

The initial sample size received from M&RA was 567,236 Marines prior to data cleaning. I first removed all observations that corresponded to sequence numbers prior to January 1, 2018, in order to limit the data to the BRS opt-in period. Next, I created a variable to keep only the final retirement plan decision for each Marine. This was done because Marines were able to change their decision from opting-out to opting-in anytime during the opt-in period. I noticed many of these decision changes. It should be noted, however, that once a Marine decided to opt-in, their decision was irrevocable. The next step was to remove all ineligible Marines.

1. Removing Ineligible Marines

Blended Retirement System opt-in eligibility was based on years of service. If a Marine had more than 12 years of service prior to January 1, 2018, they were ineligible to opt-in. If a Marine entered the Marine Corps after January 1, 2018, they were also ineligible to opt-in. I removed both of these groups of Marines from the sample by restricting the population to Marines with an Armed Forces Active Duty Base Date between January 1,

2006 and December 31, 2017. I also removed Marines who ended service prior to the opt-in period utilizing their End of Active Service (EAS) data, resulting in 166,513 Marines.

2. Independent Variables

I created indicator variables for age groups, years of service, rank, whether officer or enlisted, and the month they registered a decision. If a Marine failed to register a decision, the decision month was left blank. In order to track monthly changes in career or life events, I created variables to indicate an increase in dependents, re-enlistment, career designation for officers, and promotion.

3. Dependent Variables

The dependent variables are the opt-in month, the opt-out month, and whether a Marine actively opted-in, actively opted-out, or made no decision. The variables for opt-in/opt-out month assign a value of 1 only in the month a Marine made a decision. This allows me to run a regression for each month and display the differences in the timing of opt-in/opt-out decisions. The variables for opted-in, opted-out, and no decision assign a value of 1 to the first observation of a Marine with an opt-in code of 'O', opt-out code of 'Z', or no code at all. This allows me to determine the number of unique identifications that fall under each category, and relate the individual characteristics to their decision to opt-in/opt-out.

B. METHODOLOGY

I first present summary statistics of the decisions Marines made during the opt-in period, both for the eligible population as a whole and separately for enlisted Marines and officers. The statistics provide insight on the percentage of Marines who registered or failed to register each decision on Marine Online, the distribution across each month, the distribution across years of service cohorts, the distribution across age, and the distribution across GCT scores.

Next, I estimate a Linear Probability Model to identify the correlation between opting-in, demographic data, and life/career events. The key independent variables consist of changes in number of dependents, re-enlistment, promotion, gender, age, rank group,

race, and cognitive ability. GCT score was used as a measure of cognitive ability because a score was available for every Marine in my dataset. Ranks were grouped to identify differences between junior Marines, non-commissioned officers, staff non-commissioned officers, warrant officers, company grade officers, and field grade officers. The dependent variable was whether or not a Marine opted-in to the BRS. Regressions were run for both enlisted and officers to display overall results and then again to display monthly results.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. RESULTS

A. REGISTERING A DECISION

1. Overall Opt-in Period Decisions

Figure 1 displays the proportion of all eligible Marines who made or failed to make the choice between opting-in or opting-out of the BRS. These Marines were required to make a choice between opting-in or opting-out of the BRS via Marine Online. As the pie chart shows, a little less than half of all eligible Marines opted-in to the BRS, slightly more than a quarter opted-out, and almost a quarter failed to register a choice via Marine Online.

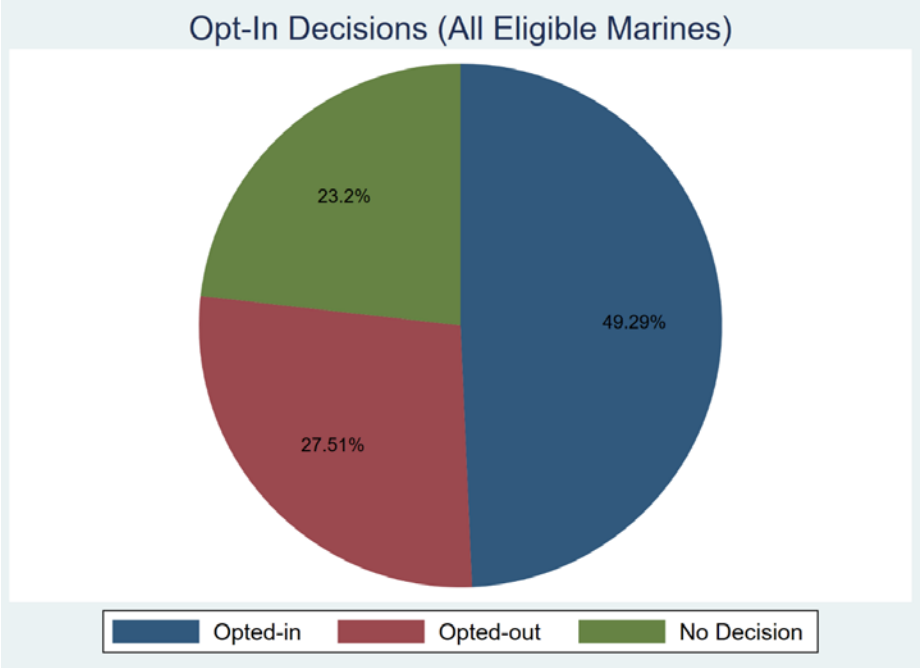

Figure 1. Opt-in Decisions: All Eligible Marines

Figure 2 displays the same decisions as the previous figure, but instead separates the results between officers and enlisted for comparison purposes. When comparing the two groups, we find that officers opted-in at a higher rate than enlisted, were slightly less likely to opt-out, and were more likely to register their decision via Marine Online.

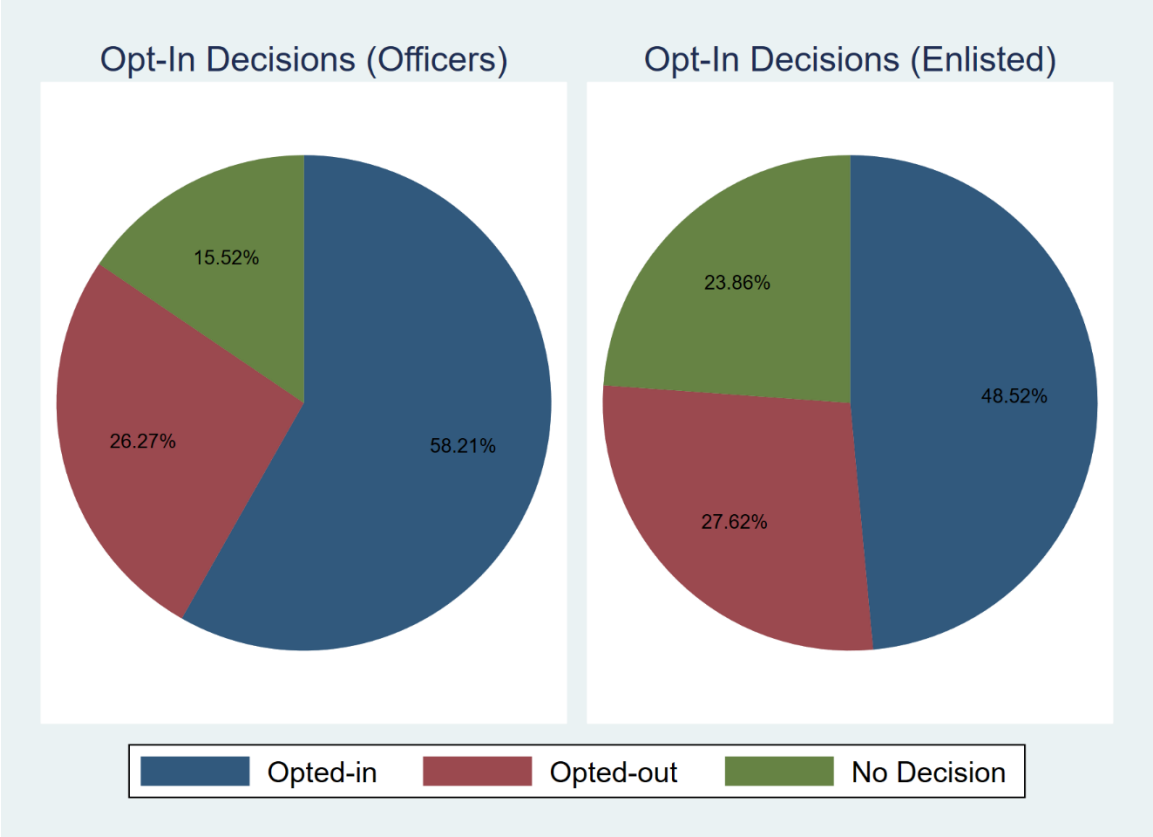

Figure 2. Opt-in Decisions: Officers vs. Enlisted

2. Opt-in Period Decisions by Month

Figure 3 displays the percentage of Marines who opted-in each month if they belong to the population that opted-in in 2018. From this histogram we observe that the decision to opt-in was bimodal, meaning that we had a large percentage of our opt-in population opt-in at the beginning and end of the opt-in period. The greatest opt-in percentage was in January and then it remained fairly steady until December, when it once again spiked.

Figure 4 displays the percentage of Marines who opted-out each month if they belong to the population that opted-out in 2018. From this histogram we observe that the decision to opt-out was also bimodal. There was a little more fluctuation in the decision to opt-out, however. The greatest opt-out percentage was in December. One explanation for this is that added pressure was placed on Marines by their leadership to register their decision in Marine Online before the December 31, 2018, deadline.

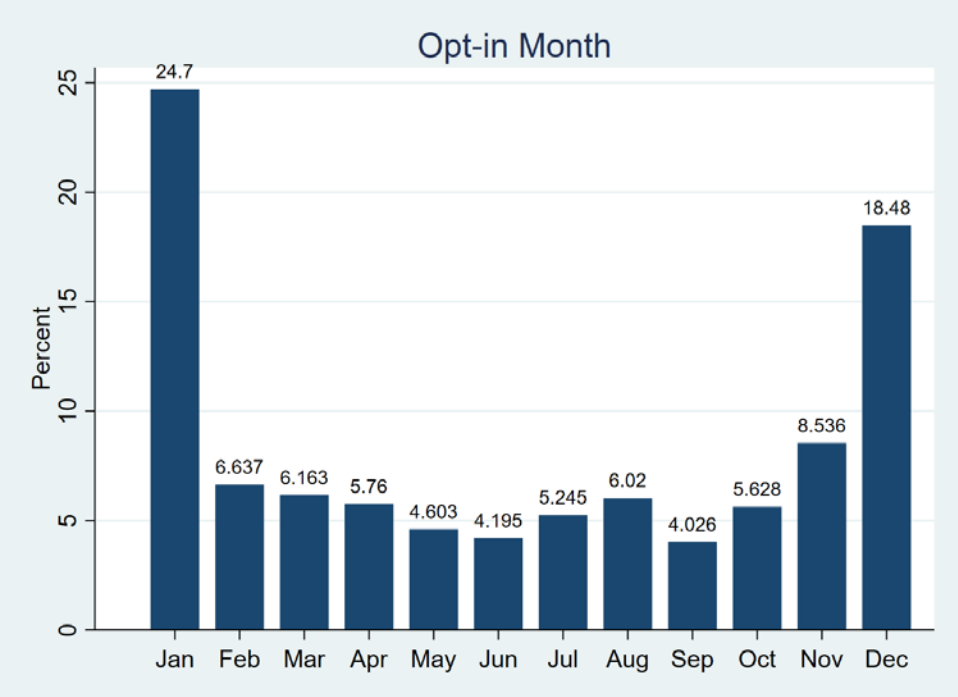

Figure 3. Opt-in Month if Opted in to BRS

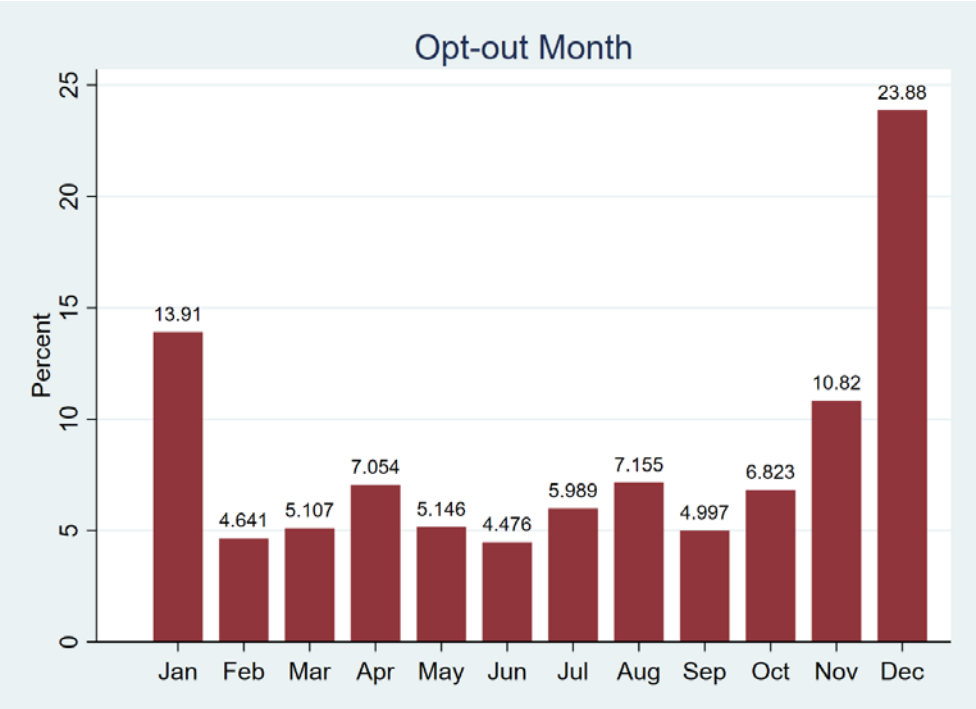

Figure 4. Opt-out Month if Opted out of BRS

B. WHO OPTED-IN

1. Opt-in Rate across GCT Distribution

Figure 5 displays the Opt-in rates across the GCT distribution. I use GCT scores to represent Marines' cognitive ability. The kernel density plot shows that both enlisted and officers with lower GCT scores are less likely to opt-in than those with higher GCT scores, meaning a higher GCT score is correlated with opting-in rather than opting-out. Not only is the average GCT score of Marines who opt-in greater than those who opt-out, the distribution of GCT scores of Marines who opted-in are shifted to the right and above of those who did not opt-in.

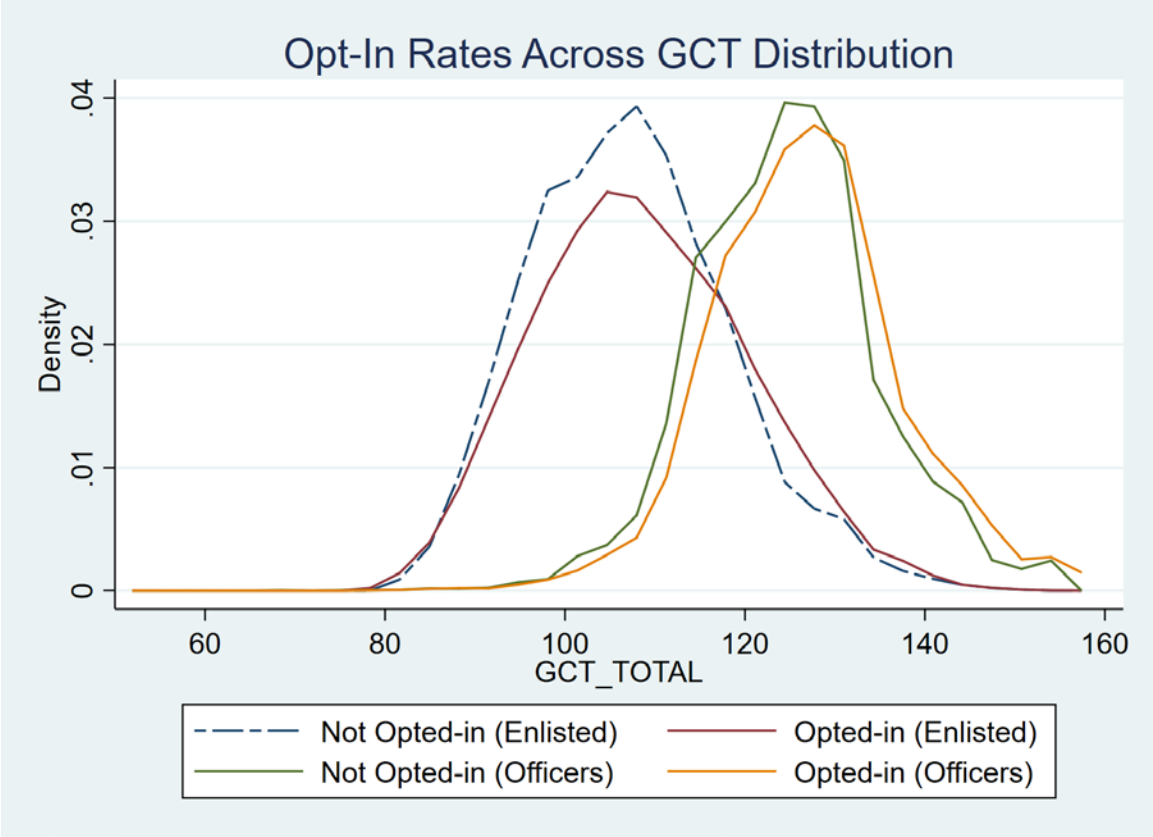

Figure 5. Opt-in Rates across GCT Distribution

2. Opt-in Percentages by Years of Service

Figures 6–8 display the percentage of enlisted Marines who made each decision and the years of service cohort they belong to. Figures 9–11 display the same information for officers. If a Marine was in the service for less than one year at the time of registering his/her decision, they were counted as years of service cohort zero. It is interesting to note that hundreds of Marines with over 10 years of service decided to opt-in to the BRS even though these Marines are often considered careerists. For instance, 10 percent of officers with 10 years of service, 8 percent with 11 years, and 2 percent with 12 years of service all chose to opt-in.

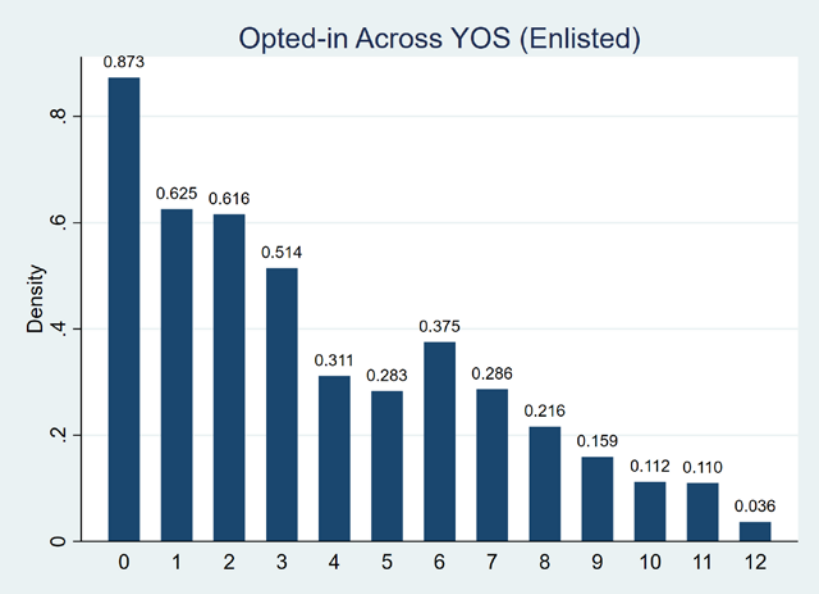

Figure 6. Opted in across YOS Distribution: Enlisted

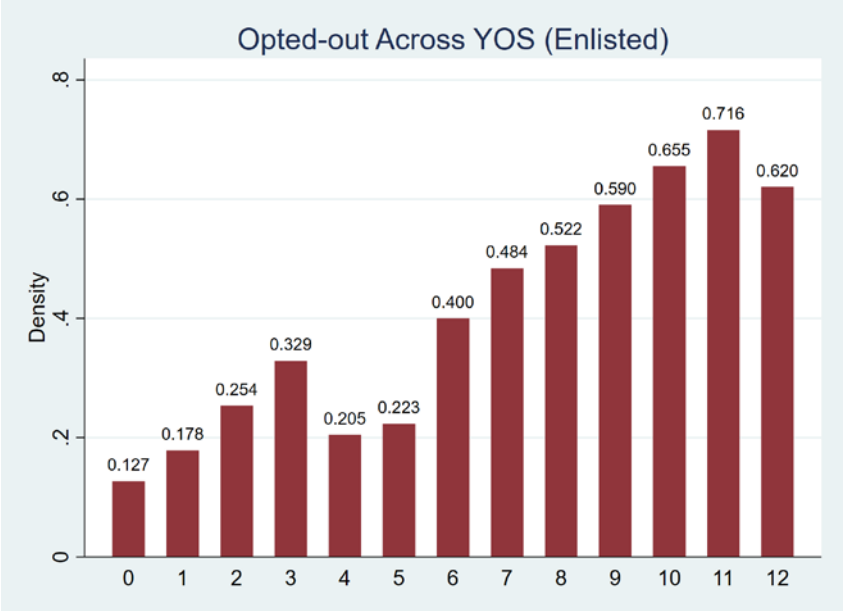

Figure 7. Opted out across YOS Distribution: Enlisted

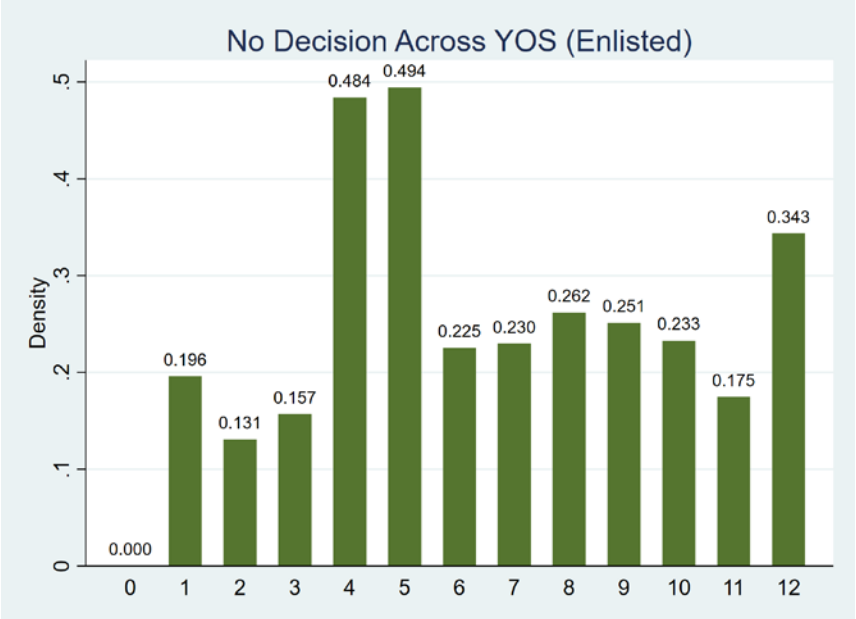

Figure 8. No Decision across YOS Distribution: Enlisted

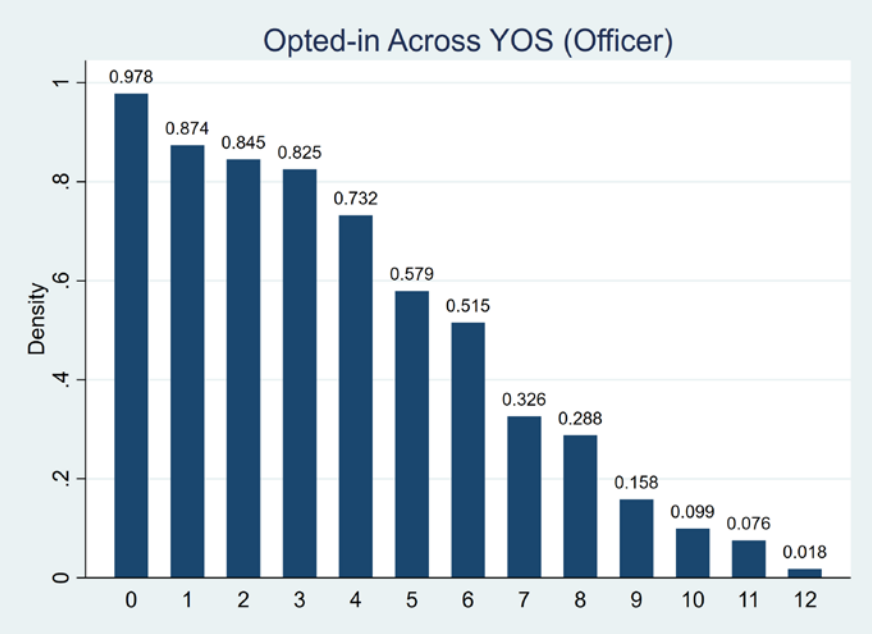

Figure 9. Opted in across YOS Distribution: Officers

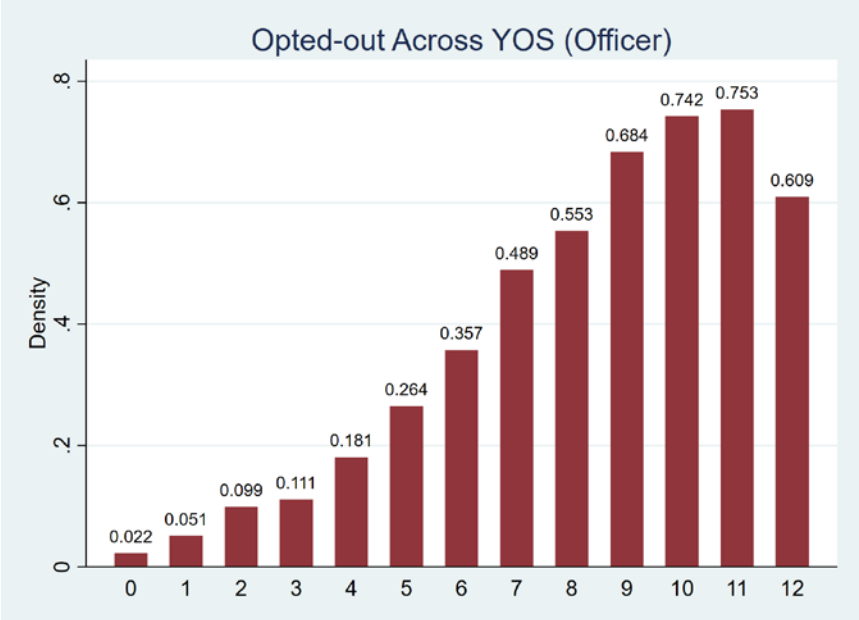

Figure 10. Opted out across YOS Distribution: Officers

Figure 11. No Decision across YOS Distribution: Officers

3. Opt-in Decisions by Age

Figure 12 displays the age distribution of the Marines who opted-in to the BRS. There is a clear linear relationship across age. Of the Marines who opted-in, younger Marines made up a larger portion than older Marines. Sixty-five percent of those aged 17–21 opted-in, and 46 percent of those aged 22–25 opted-in, while only 6 percent did among those aged 40+. This seems rational if we consider that the closer a Marine gets to retirement age, the less beneficial it is to opt-in.

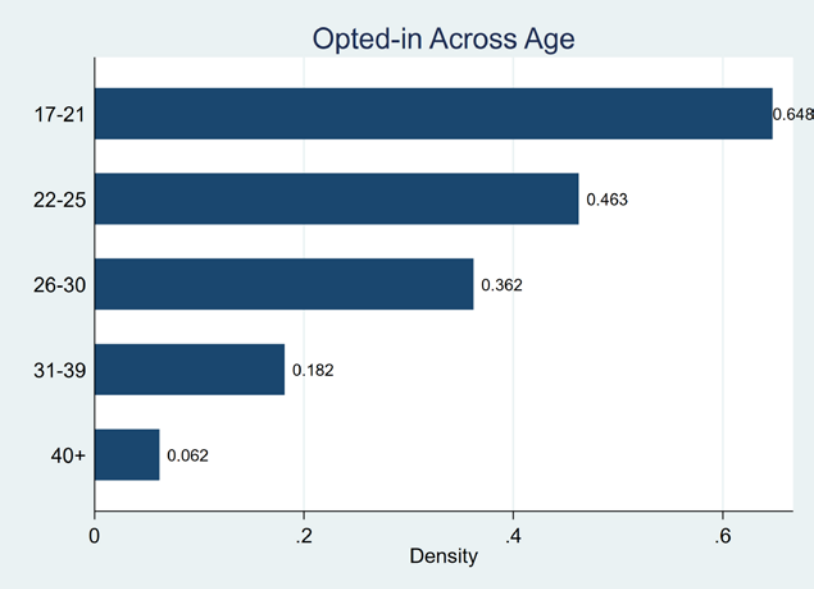

Figure 12. Opted in across Age Distribution

4. Enlisted vs. Officer Opt-in

Instead of pure summary statistics, my next set of analyses examines multiple variables that may predict eligible Marines' decision. Table 2 displays the overall Linear Probability Model regression output for enlisted and officers. A number of these variables predict opt-in behavior in the expected direction. For instance, Marines who were promoted in 2018 registered to opt-in 11% points higher among enlisted; 8.3% points higher among officers.

On average, male enlisted Marines were 3.8% points less likely to opt-in than female enlisted Marines and male officers were 3.5% points less likely to opt-in than female officers. Staff Non-Commissioned Officers (SNCOs) were 17.6% points less likely to opt-in than Marines junior to them. For officers, accepting career designation resulted in their being 5.6% points less likely to opt-in. Company grade officers were the only ranks that were positively correlated with opting-in. I find that Marines in the aviation community are more likely to opt-in than their counterparts in other communities. It is important to note that while many of the independent variables are statistically significant, a very small percentage of the variation between the dependent variable and independent variables is explained by the model.

Table 2. Opt-in Results

	(1) Enlisted Opt-in	(2) Officer Opt-in
Male	-0.038***	-0.035***
	(0.004)	(0.004)
Increase Dependents	0.037***	0.033***
	(0.004)	(0.004)
Re-Enlisted	0.007**	
	(0.004)	
Career Designated		-0.056***
		(0.009)
Promoted	0.110***	0.083***
	(0.003)	(0.002)
Over 10 YOS	-0.132***	-0.090***
	(0.007)	(0.006)
Age	-0.025***	-0.037***
	(0.000)	(0.000)
Non-NCO (E1-E3)	-0.046***	
	(0.004)	
NCO (E4-E5)	-0.108***	
	(0.003)	
SNCO (E6+)	-0.176***	
	(0.005)	
Warrant Officer		-0.087***
		(0.031)
Co. Grade Officer (O1-O-3)		0.340***
		(0.006)
Field Grade Officer (O4+)		-0.042***
		(0.015)
Asian	0.071***	0.067***
	(0.007)	(0.007)
Combat Service Support	0.036***	0.034***
	(0.003)	(0.003)
Aviation	0.130***	0.117***
	(0.003)	(0.003)
GCT Score	0.019***	0.047***
	(0.002)	(0.002)
Constant	1.020***	1.055***
	(0.015)	(0.014)
Observations	166,513	166,513
R-squared	0.107	0.119

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Opt-in Decisions by Month

Tables 3–6 display the regression output for opt-in decisions by month. For Tables 3 and 5, opt-in is equal to 1 for the month they opted-in and equal to 1 only in that month. For Tables 4 and 6, cumulative opt-in is equal to 1 for the month they opted-in and every month thereafter. There is quite a bit of fluctuation throughout the months in the non-cumulative opt-in regression, with explanatory variables being statistically significant in some months, but not in others. For the cumulative opt-in regression, the majority of explanatory variables are statistically significant in every month. The direction of the effect an explanatory variable has on opt-in behavior fluctuates in both regression types. Most of the time the variation is less than a percentage point, but other times it may swing from multiple percentage points between negatively and positively correlated.

Similar to the overall results previously discussed, being female, having an increase in dependents, a promotion, less than 10 years of service, being younger, a company grade officer, Asian, having an aviation MOS, and higher GCT scores, are positively correlated with opting-in. As may be expected, the most significant variables are related to years of service, GCT scores, rank, and career designation. On average, having over 10 years of service meant a Marine was less likely to opt-in each month. This was especially true at the beginning and end of the opt-in period. Being promoted towards the end of the opt-in period was positively correlated with opting-in, but re-enlisting appears to have little effect. SNCOs were consistently less likely to opt-in each month, but company and field grade officers were more likely to opt-in. For officers, accepting career designation was negatively correlated with opting-in in every month. Positive reinforcement from being career designated may have made Marines more optimistic about their likelihood of reaching 20 years of service.

GCT scores are sometimes significant or even negative in the monthly opt-in regressions (Tables 3 and 5) but are clearly statistically significant and positive in the cumulative monthly opt-in regressions (Tables 4 and 6). This confirms the raw correlation identified in the kernel density graphs earlier, where Marines with higher cognitive ability are more likely to opt-in. I witness the same differences between the monthly opt-in regressions and the cumulative monthly opt-in regressions for the enlisted rank groups

junior to SNCO, and the enlisted and officer MOS groups. With regard to the direction of correlation, every other variable is fairly consistent across the two model types for both enlisted and officers. Note, similar to the overall model, a very small percentage of the variation between the dependent variable and independent variables is explained by the model in these tables as well.

Table 3. Opt-in Results by Month: Enlisted

	(1) Jan	(2) Feb	(3) Mar	(4) Apr	(5) May	(6) Jun	(7) Jul	(8) Aug	(9) Sep	(10) Oct	(11) Nov	(12) Dec
Male	-0.010***	0.004	0.000	-0.003**	-0.006***	-0.002	-0.001	-0.005***	-0.003**	-0.002*	-0.003**	-0.001
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Increased Dependents	0.019**	0.003	0.005	0.006	0.007*	0.009**	0.007*	0.011***	0.004	0.006	0.014***	0.001
	(0.008)	(0.007)	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Re-Enlisted	0.008	0.012	0.002	0.004	0.003	-0.003	-0.000	-0.003	0.004	0.002	0.004	0.011***
	(0.006)	(0.009)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Promoted	0.023***	-0.017***	-0.003	0.002	-0.002	0.001	0.002	0.002	0.007***	0.007***	0.006***	0.016***
	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Over 10 YOS	-0.009**	-0.085***	-0.009***	-0.006**	-0.001	-0.001	-0.000	0.000	-0.003	-0.001	-0.003	-0.003
	(0.004)	(0.005)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Age	-0.002***	-0.015***	-0.004***	-0.004***	-0.003***	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Non-NCO (E1-E3)	0.075***	-0.348***	-0.040***	-0.030***	-0.011***	-0.007***	-0.000	0.004**	0.013***	0.003*	0.017***	0.034***
	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
NCO (E4-E5)	0.020***	-0.279***	-0.033***	-0.026***	-0.011***	-0.009***	-0.005***	-0.002	0.003	-0.004***	0.001	0.008***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
SNCO (E6+)	-0.022***	-0.219***	-0.023***	-0.022***	-0.013***	-0.008***	-0.007***	-0.006***	-0.001	-0.008***	-0.005**	-0.009***
	(0.004)	(0.005)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Asian	-0.007*	0.048***	0.006**	0.006**	0.005**	0.003	-0.001	0.005**	0.001	0.000	0.001	0.002
	(0.004)	(0.005)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Combat Service Support	0.007***	0.041***	0.010***	0.007***	0.001	-0.001	-0.002**	-0.001	0.001	-0.003***	-0.003***	-0.014***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Aviation	0.010***	0.074***	0.018***	0.014***	0.005***	-0.000	0.002**	0.009***	0.013***	0.001	-0.002*	-0.015***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GCT Score	-0.004***	0.023***	0.001	0.002**	0.002*	0.002**	-0.002***	-0.003***	-0.001*	-0.005***	-0.002***	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.128***	0.610***	0.156***	0.126***	0.101***	0.081***	0.078***	0.096***	0.076***	0.074***	0.064***	0.075***
	(0.009)	(0.013)	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.007)
Observations	166,411	161,767	162,093	162,566	162,857	163,799	164,988	165,588	165,794	165,950	166,192	166,322
R-squared	0.018	0.059	0.007	0.005	0.004	0.004	0.004	0.005	0.006	0.003	0.005	0.010

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4. Cumulative Opt-in Results by Month: Enlisted

	(1) Jan	(2) Feb	(3) Mar	(4) Apr	(5) May	(6) Jun	(7) Jul	(8) Aug	(9) Sep	(10) Oct	(11) Nov	(12) Dec
Male	0.004	0.004	0.000	-0.006*	-0.010***	-0.011***	-0.016***	-0.019***	-0.021***	-0.025***	-0.025***	-0.035***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Increased Dependents	0.003	-0.003	0.015*	-0.000	0.009	0.011	0.000	0.022**	0.041***	0.010	0.023*	0.048***
	(0.007)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.013)	(0.011)	(0.013)	(0.013)
Re-Enlisted	0.012	-0.018**	0.022***	0.024**	0.005	-0.007	-0.007	-0.027***	0.026***	0.006	0.025***	0.013
	(0.009)	(0.008)	(0.008)	(0.010)	(0.012)	(0.012)	(0.012)	(0.008)	(0.009)	(0.009)	(0.009)	(0.010)
Promoted	-0.017***	-0.035***	-0.032***	0.007	-0.005	-0.007	-0.002	-0.017***	0.009	-0.011**	0.040***	0.079***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.007)
Over 10 YOS	-0.085***	-0.095***	-0.099***	-0.099***	-0.101***	-0.100***	-0.099***	-0.102***	-0.102***	-0.101***	-0.101***	-0.111***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Age	-0.015***	-0.019***	-0.023***	-0.026***	-0.028***	-0.030***	-0.032***	-0.034***	-0.035***	-0.037***	-0.038***	-0.040***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Non-NCO (E1-E3)	-0.348***	-0.387***	-0.415***	-0.427***	-0.420***	-0.420***	-0.416***	-0.403***	-0.403***	-0.391***	-0.360***	-0.287***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
NCO (E4-E5)	-0.279***	-0.310***	-0.333***	-0.342***	-0.338***	-0.340***	-0.341***	-0.336***	-0.339***	-0.337***	-0.326***	-0.305***
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
SNCO (E6+)	-0.219***	-0.237***	-0.257***	-0.267***	-0.266***	-0.271***	-0.276***	-0.274***	-0.282***	-0.288***	-0.299***	-0.318***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Asian	0.048***	0.054***	0.061***	0.066***	0.068***	0.066***	0.070***	0.072***	0.071***	0.072***	0.074***	0.067***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)
Combat Service Support	0.041***	0.050***	0.054***	0.054***	0.051***	0.049***	0.048***	0.048***	0.045***	0.042***	0.028***	0.034***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Aviation	0.074***	0.092***	0.103***	0.107***	0.104***	0.107***	0.115***	0.128***	0.129***	0.126***	0.111***	0.121***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
GCT Score	0.023***	0.024***	0.028***	0.030***	0.060***	0.059***	0.057***	0.059***	0.054***	0.053***	0.052***	0.049***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Constant	0.610***	0.770***	0.897***	0.989***	0.912***	0.982***	1.067***	1.130***	1.203***	1.277***	1.346***	1.472***
	(0.013)	(0.014)	(0.015)	(0.016)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Observations	161,767	162,093	162,566	162,857	163,799	164,988	165,588	165,794	165,950	166,192	166,322	166,411
R-squared	0.059	0.064	0.068	0.068	0.067	0.069	0.072	0.076	0.079	0.082	0.087	0.112

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5. Opt-in Results by Month: Officers

	(1) Jan	(2) Feb	(3) Mar	(4) Apr	(5) May	(6) Jun	(7) Jul	(8) Aug	(9) Sep	(10) Oct	(11) Nov	(12) Dec
Male	0.003	0.000	-0.004**	-0.006***	-0.002	-0.001	-0.005***	-0.003*	-0.002*	-0.003**	-0.000	-0.009***
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Increased Dependents	0.005	0.005	0.006	0.007*	0.009**	0.007*	0.011***	0.004	0.006	0.014***	0.001	0.016**
	(0.007)	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.008)
Career Designated	-0.132***	-0.023***	-0.020***	-0.002	-0.001	-0.002	-0.004	-0.002	-0.010***	-0.008**	-0.003	-0.002
	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)
Promoted	-0.013***	-0.002	0.002	-0.002	0.001	0.002	0.002	0.007***	0.007***	0.003**	0.013***	0.019***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)
Over 10 YOS	-0.047***	-0.003	-0.003	-0.001	-0.001	-0.000	-0.001	-0.004*	-0.001	-0.003	-0.007**	-0.020***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Age	-0.007***	-0.003***	-0.003***	-0.003***	-0.003***	-0.002***	-0.003***	-0.003***	-0.002***	-0.002***	-0.004***	-0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Warrant Officer	0.060*	0.002	-0.005	-0.004	-0.002	-0.001	0.002	-0.005	0.001	-0.006	-0.006	-0.019
	(0.032)	(0.012)	(0.011)	(0.011)	(0.010)	(0.009)	(0.010)	(0.011)	(0.009)	(0.011)	(0.013)	(0.019)
Co Grade Officer	0.341***	0.043***	0.036***	0.013***	0.009***	0.007***	0.004*	-0.002	0.010***	0.003	-0.004	-0.011***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Field Grade Officer	0.158***	0.033***	0.027***	0.011*	0.012**	0.008	0.008	0.005	0.013***	0.006	0.003	0.006
	(0.014)	(0.008)	(0.007)	(0.007)	(0.006)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.007)	(0.009)
Asian	0.046***	0.006**	0.006**	0.005**	0.003	-0.001	0.005**	0.002	0.000	0.001	0.002	-0.007*
	(0.005)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Combat Service Support	0.045***	0.011***	0.008***	0.001	-0.001	-0.002**	-0.001	-0.000	-0.003***	-0.004***	-0.016***	0.002
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Aviation	0.074***	0.018***	0.014***	0.005***	-0.000	0.002*	0.009***	0.012***	0.000	-0.004***	-0.017***	0.006***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
GCT Score	0.029***	0.002*	0.003***	0.002**	0.002**	-0.002**	-0.003***	-0.001	-0.004***	-0.001	-0.000	-0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.089***	0.094***	0.080***	0.090***	0.076***	0.083***	0.106***	0.100***	0.081***	0.094***	0.138***	0.267***
	(0.012)	(0.006)	(0.006)	(0.006)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.006)	(0.008)
Observations	161,767	162,093	162,566	162,857	163,799	164,988	165,588	165,794	165,950	166,192	166,322	166,411
R-squared	0.056	0.007	0.006	0.004	0.004	0.004	0.005	0.005	0.003	0.004	0.007	0.011

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6. Cumulative Opt-in Results by Month: Officers

	(1) Jan	(2) Feb	(3) Mar	(4) Apr	(5) May	(6) Jun	(7) Jul	(8) Aug	(9) Sep	(10) Oct	(11) Nov	(12) Dec
Male	0.003	0.003	-0.002	-0.008**	-0.012***	-0.013***	-0.019***	-0.021***	-0.024***	-0.027***	-0.027***	-0.035***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Increased Dependents	0.005	-0.002	0.017*	0.001	0.011	0.013	0.000	0.025**	0.045***	0.011	0.026**	0.047***
	(0.007)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.013)	(0.011)	(0.013)	(0.013)
Career Designated	-0.132***	-0.152***	-0.147***	-0.135***	-0.119***	-0.114***	-0.111***	-0.104***	-0.093***	-0.092***	-0.090***	-0.088***
	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)
Promoted	-0.013***	-0.031***	-0.033***	0.007	-0.009*	0.001	0.004	-0.011**	0.019***	0.004	0.043***	0.078***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.007)
Over 10 YOS	-0.047***	-0.050***	-0.049***	-0.051***	-0.055***	-0.055***	-0.055***	-0.058***	-0.059***	-0.060***	-0.068***	-0.088***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Age	-0.007***	-0.011***	-0.014***	-0.017***	-0.019***	-0.021***	-0.024***	-0.027***	-0.028***	-0.031***	-0.034***	-0.041***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Warrant Officer	0.060*	0.042*	0.022	0.017	0.014	0.012	0.014	0.010	0.008	0.001	-0.006	-0.025
	(0.032)	(0.024)	(0.025)	(0.026)	(0.027)	(0.028)	(0.029)	(0.030)	(0.030)	(0.030)	(0.031)	(0.031)
Co Grade Officer	0.341***	0.381***	0.408***	0.415***	0.402***	0.402***	0.402***	0.395***	0.398***	0.398***	0.390***	0.376***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Field Grade Officer	0.158***	0.189***	0.196***	0.190***	0.185***	0.184***	0.183***	0.177***	0.170***	0.164***	0.160***	0.162***
	(0.014)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)
Asian	0.046***	0.051***	0.058***	0.063***	0.065***	0.063***	0.068***	0.070***	0.069***	0.070***	0.073***	0.066***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)
Combat Service Support	0.045***	0.056***	0.060***	0.061***	0.058***	0.057***	0.055***	0.054***	0.050***	0.046***	0.030***	0.032***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Aviation	0.074***	0.093***	0.105***	0.109***	0.107***	0.110***	0.118***	0.131***	0.131***	0.127***	0.111***	0.117***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
GCT Score	0.029***	0.031***	0.036***	0.037***	0.065***	0.064***	0.062***	0.064***	0.059***	0.059***	0.059***	0.058***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Constant	0.089***	0.188***	0.279***	0.363***	0.312***	0.388***	0.489***	0.579***	0.662***	0.756***	0.888***	1.149***
	(0.012)	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Observations	161,767	162,093	162,566	162,857	163,799	164,988	165,588	165,794	165,950	166,192	166,322	166,411
R-squared	0.056	0.061	0.064	0.065	0.064	0.066	0.070	0.075	0.079	0.082	0.090	0.114

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

6. Thrift Savings Plan Contributions

Tables 7 and 8 display the summary statistics of the maximum Thrift Savings Plan contribution percentage rates over the pay periods a Marine was enrolled in 2018. This separate database was pulled from Operational Data Store Enterprise (ODSE), and I observe this for 104,489 Marines among the study population. The data indicate a large number of 0 contributions. While this may indeed be the case for last-minute December enrollees into the TSP, the "0" entries indicate some measurement error in the data.

Table 7. TSP Traditional Contribution Percentage Rates

(max) tsp_base_pay_percentage_rt

Percentiles		Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	104,489
25%	0	0	Sum of Wgt.	104,489
50%	0		Mean	1.670099
		Largest	Std. Dev.	3.857303
75%	2	100		
90%	5	100	Variance	14.87879
95%	10	100	Skewness	6.724488
99%	15	100	Kurtosis	116.1796

Table 8. TSP Roth Contribution Percentage Rates.

(max) tsp_roth_base_pay_prcntg_rt

Percentiles		Smallest		
1%	0	0		
5%	0	0		
10%	0	0	Obs	104,489
25%	1	0	Sum of Wgt.	104,489
50%	5		Mean	5.459503
		Largest	Std. Dev.	6.598288
75%	7	100		
90%	10	100	Variance	43.53741
95%	15	100	Skewness	5.398195
99%	27	100	Kurtosis	61.70195

The tables do show that Marines' contributions to the traditional TSP were at the maximum, an average of less than 2%, and contributions to the Roth TSP were at an average of nearly 5.5%. Contributing to the Roth TSP is the optimal choice, so it stands to reason that the Roth TSP contribution percentages would be higher. The average Roth TSP contribution level satisfies the optimal amount to maximize government matching under the BRS. Note, however, that even for Roth TSP at the 25th percentile the TSP contribution is only 1%, far less than the matching rate. Contributions to the traditional TSP are 5% only at the 90th percentile. All together, these summary statistics indicate most Marines who have opted-in to TSP are leaving money on the table. Finally, it is interesting to note that a few Marines were contributing 100 percent of their base pay to TSP in 2018. This may be the result of being on deployment at the time, and maximizing their contributions.

V. CONCLUSION

The BRS opt-in period provides a unique opportunity to analyze the retirement decisions of a large population of service members. Although I focus solely on the decisions of members of the Marine Corps, there is a great deal more research that can and should be conducted across all military branches. Analyzing the Marine Corps is interesting from a behavioral economics viewpoint because the Marine Corps is the only branch to mandate that an opt-in/opt-out decision be made. The rest of the military branches still launched an information campaign, but there was no formal nudge to make a decision. A comparison of opt-in rates across all branches of the military would thus be informative to see if the USMC nudge worked differently.

Given that nearly a quarter of eligible Marines failed to register a decision via Marine Online, making a decision mandatory does not necessarily mean that Marines will comply. Even a constant reminder on the home screen of Marine Online and periodic reminders in the form of MARADMINs did not result in 100% compliance. This may be in large part due to the fact that the default choice was to opt-out and remain under the legacy retirement system, an indication of status quo bias. Had the default choice been that a Marine was automatically opted-in to the BRS, we may have seen greater policy compliance. The best that can be hoped for is that nudging Marines to make a decision had a positive impact, and the majority of Marines made the optimal decision for their situation.

Some predictions on opt-in behavior prior to the opt-in period were optimistic that Marines would make the optimal decision based on their years of service. Rand Corporation predicted that 100 percent of enlisted Marines with four or less years of service would opt-in and that no officer with five or more years of service would opt-in, as this is what is optimal for them (Asch et al., 2017). The actual results suggest a different story. For instance, only 31% of enlisted and 73% of officers with 4 years of service actually opted-in. Similarly, a significant number of career Marines, those with over 10 years of service, opted-in to the BRS. One could argue that these decisions are not rational. Further study on whether or not these young and career Marines are forming correct

or incorrect expectations of their likelihood of promotion may shed light on these particular opt-in decisions.

Overall, the evidence in my research is broadly consistent with the prevailing result in behavioral economics of irrational decision making with regard to retirement savings. Too many factors are involved in an individual's financial decision to believe that a standard economic model will correctly predict their behavior. Individuals are bounded by the information they are provided and their cognitive ability. The likeliest explanation for the lower-than-forecasted opt-in rates among Marines is that it is difficult for them to calculate their optimal retirement decision, even though they were provided with a BRS calculator. The uncertainty about their futures and the performance of the Thrift Savings Plan could also have greatly influenced their decisions. Though I did not find a rational explanation in my data, additional research on how a Marine's probability of promotion or Thrift Savings Plan performance in 2018 influenced their decision may be beneficial. Optimism about their career opportunities or portfolio performance could have had an impact.

LIST OF REFERENCES

2018 Military pay tables. Retrieved from https://www.dfas.mil/militarymembers/payentitlements/Pay-Tables.html

Asch, B. J., Mattock, M. J., & Hosek, J. (2017). "The Blended Retirement System: retention effects and continuation pay cost estimates for the armed services." Retrieved from https://www.rand.org/pubs/research_reports/RR1887.html

Cunha, J. M., & Menichini, A. A. (2014). Pensions and intertemporal choice: evidence from the U.S. military. Naval Postgraduate School Technical Report. Retrieved from http://hdl.handle.net/10945/44906

Cunha, J. M., Menichini, A. A., & Crockett, A. (2015). The retention effects of high years of service cliff-vesting pension plans. *Economics Letters, 126*, 6–9. Retrieved from http://dx.doi.org/10.1016/j.econlet.2014.11.005

Department of Defense Office of the Actuary. (2017). FY2016 DoD statistical report on the military retirement system. Retrieved from https://actuary.defense.gov/Portals/15/Documents/MRS_StatRpt_2016%20v4%20FINAL.pdf?ver=2017-07-31-104724-430

Kamarck, K. N. (2018). Military retirement: Background and recent developments. Congressional Research Service Report. Retrieved from https://fas.org/sgp/crs/misc/RL34751.pdf

MARADMIN 210/17 (2017a). "Discontinuation of Career Status Bonus and REDUX retirement plan." Retrieved from https://www.marines.mil/News/Messages/MARADMINS/Article/1167291/discontinuation-of-career-status-bonus-and-redux-retirement-plan/

MARADMIN 575/17 (2017b). "Continuation Pay Program for CY18 for Blended Retirement System (BRS) participants." Retrieved from https://www.marines.mil/DesktopModules/ArticleCS/Print.aspx?PortalId=59&ModuleId=46529&Article=1343484

MARADMIN 634/18 (2018). "Blended Retirement System opt-in election period update number 3." Retrieved from https://www.marines.mil/News/Messages/MARADMINS/Article/1683913/blended-retirement-system-opt-in-election-period-update-number-3/

MCBUL 1800 DTD 26JUN18. "Blended Retirement System policy." Retrieved from https://www.marines.mil/Portals/59/Publications/MCO%201800%20v2.pdf?ver=2018-07-19-083450-487

Public Law 114–92. “National Defense Authorization Act for Fiscal Year 2016.” Retrieved from https://www.congress.gov/114/plaws/publ92/PLAW-114publ92.pdf

Simon, C. J., Warner, J. T., & Pleeter, S. (2015). Discounting, cognition, and financial awareness: New evidence from a change in the military retirement system. *Economic Inquiry, 53*(1), 318–334. Retrieved from http://libproxy.nps.edu/login?url=https://search.proquest.com/docview/1684406702?accountid=12702

Thaler, R. H., & Benartzi, S. (2004). Save more tomorrow: Using behavioral economics to increase employee Saving. *Journal of Political Economy, 112*(1), S164–S187. Retrieved from http://libproxy.nps.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=12603985&site=ehost-live&scope=site

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California