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ORB Impact on Officer Retention in the Navy Explosive Ordnance Disposal (EOD) Community

June 2022

LT Daniel R. Marriott, USN

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Department of Defense Management

Naval Postgraduate School

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Prepared for the Naval Postgraduate School, Monterey, CA 93943

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ABSTRACT

The Navy Explosive Ordnance Disposal (NEOD) community continues to struggle to retain officers at eight to ten years of commissioned service (YCS). In an effort to incentivize more officers to stay, the Navy implemented an officer retention bonus (ORB) in 2005. Since its inception, the bonus has had a statistically significant increase in retention but has diminished in its attractiveness over time, as fewer and fewer officers take the bonus each year. The object of this project is to study the effectiveness of monetary incentives, specifically the ORB, and its ability to influence the retention decisions of Navy EOD officers at critical career points. Using demographic data from the Officer Personnel Information System (OPINS) from various Navy EOD year groups, a logistic regression analysis was run to quantify the relationship between ORB amounts and "take" decisions. Based on the regression results, ORB amounts were shown to be statistically significant at the 95 percent confidence level. These findings were then used to develop a logit model. Using this model, it was shown that in order to return to the targeted 75 percent "take" rate, the ORB amount would need to be increased and adjusted for inflation. Therefore, it is recommended that the ORB be updated, at a minimum, on a periodic basis to keep pace with inflation, if it is to remain competitive with earnings potential outside of the Navy.

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Thank you to those who aided my research, data crunching, and writing, especially my advisory team, Dr. Amilcar Menichini and Dr. Tom Ahn. To LCDR Jack Damon and EODCM Bob Frew, who routinely answered my questions and provided extensive data making this research possible. Lastly, to Sean Wilmarth for assisting in model development and providing candid feedback on data structuring throughout the process. Thank you all!

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LIST OF ACRONYMS AND ABBREVIATIONS

BLS   Bureau of Labor Statistics

CSRB   Critical Skills Retention Bonus

DH   Department Head

DOPMA   Defense Officer Personnel Management Act

NEOD   Navy Explosive Ordnance Disposal

OAIS   Officer Assignment Information System

OCS   Officer Candidate School

OFRP   Optimized Fleet Response Plan

OPINS   Officer Personnel Information System

ORB   Officer Retention Bonus

ROC   Receiver Operating Characteristics

ROTC   Reserve Officer Training Corps

STA-21   Seaman to Admiral-21 Program

URL   Unrestricted Line

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I. INTRODUCTION

A. BACKGROUND

As the Navy Explosive Ordnance Disposal (NEOD) community continues to pivot towards relevancy in a conflict with great competitors with more sophisticated weapons, Navy EOD units are placing a greater emphasis on retention as Navy EOD's "competitive advantage against an adversary is our sailors … we have to invest in our sailors to remain on top" (Cox, 2019, para. 9). Anne Mulcahy, a prominent CEO in the private sector agrees that "employees are a company's greatest asset — they're your competitive advantage. You want to attract and retain the best; provide them with encouragement, stimulus, and make them feel that they are an integral part of the company's mission" (Bottary, 2020, para. 1). This quote is as applicable to the military as it is the private sector as it is important to not only attract the best talent, but retain it. To date, the NEOD officer community has and continues to attract some of the best talent in the armed forces as evident by the stringent selection criteria and competitive accession process. The NEOD community struggles to retain its talent as many officers decide to separate from active service at a critical career point, eight to ten years of commissioned service (YCS). As "retaining EOD Warfare Officers is a top priority of the Navy" (Office of the Chief of Naval Operations [CNO], 2017, para. 2), this project seeks to better understand specific financial incentives available to the NEOD officer community (the officer retention bonus (ORB)), its impact on retention as measured by the "take rate," and finally offers a model to predict officer "take rates" with varying ORB amounts.

The retention of Navy EOD officers is a multifaceted issue that makes identifying effective retention incentives difficult. From the ORB performance data available however, it is clear that since its implementation in 2005, the retention bonuses offered to NEOD officers has had a statistically significant impact on targeted year group retention. This retention tool however, appears to be waning in effectiveness as it has remained relatively unchanged since inception and has been subject to erosion by greater economic factors such as inflation. This is evident by the decreasing "take rate"—defined as the percentage

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of officers opting for the bonus out of those eligible in exchange for an additional service requirement.

B. SCOPE AND GOALS

The NEOD community struggles to retain officers at eight to ten years of commissioned service (YCS). To incentivize more officers to stay, the Navy first implemented a Critical Skills Retention Bonus (CSRB) in 2005 that was later rebranded in 2015 as the Officer Retention Bonus (ORB) (Office of the Under Secretary of Defense [OUSD], 2005). Despite "significant changes to the EOD officer career progression and larger Navy retirement incentives" (J. Damon, email to author, December 12, 2021) the bonus amount and payout structure has undergone minimal changes and is diminishing in its attractiveness, as evident by the decreasing "take rate." This project explores the effectiveness of the ORB on the Navy EOD officer community, seeks to better understand its competitiveness as compared to opportunities outside the Navy, and offers a model based on logistic regression to predict officer "take rates" with varying ORB amounts. The goal of this study is to provide recommended changes to the current ORB to be more effective. For simplicity, this project limits the scope of the study to the LT bonus amount ($80,000) and payment structure of four years ($20,000/yr), (CNO, 2017).

C. PIPELINE/COST TO MAKE

The Navy differs from the private sector in multiple ways, but chiefly among them is that it must promote from within and cannot rely on outside talent to fill billets. This makes retention a key issue particularly amongst smaller communities. As the smallest Unrestricted Line (URL) officer community in the Navy, the Navy EOD community accounts for only 2 percent of all URL officers (United States Navy [USN], n.d.). Each year the community accesses approximately 33 total officers across the Naval Academy (16), Reserve Officer Training Corps (12), Officer Candidate School (OCS-4), Seaman-to-Admiral (STA-21-1) (J. Damon, email to author, March 11, 2022). Once selected, EOD officer candidates attend a lengthy initial training pipeline (Figure 1) that spans approximately 20 months (USN, n.d.). Aside from accession issues, there is a long lead time to make an EOD officer and substantial cost to train one. Cost estimates for one NEOD

officer from accession to completion of initial training is likely in excess of $255,970.47 (R. Frew, email to author, January 11, 2022). This lengthy and demanding initial training pipeline results in a combined (officer and enlisted) failure rate of 73.72 percent. In other words, out of the 300 officers and enlisted accessed each year, approximately only 79 successfully graduate the pipeline and show up to their first Mobile Unit (R. Frew, email to author, March 3, 2022). Despite a substantial combined failure rate, the failure rate for NEOD officers is significantly less and averages approximately 8.5 percent or two officers each year. This relatively low failure rate is likely attributable to the challenging screening and selection process. At any given time, approximately 450 active-duty Navy EOD officers exist across all ranks while Navy EOD 1140 officer billets across the DOD totaled 341 in 2022 (J. Damon, email to author, March 11, 2022). In summary, the Navy has a significant amount of time and money invested in each officer by the time they show up to their first operational assignment making retention of paramount importance to maintain community health.
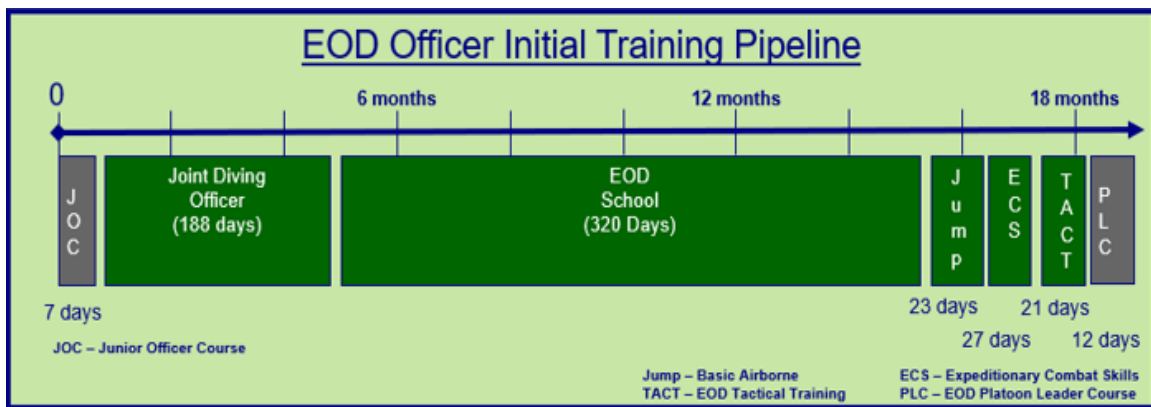
Figure 1.   Initial Training Pipeline Overview.
Source: USN (n.d.).

D.   CAREER PATH

As NEOD officers develop in the community, they follow a specified career path with the career milestones illustrated in Figure 2. The EOD warfare (KG5) qualification must be obtained 24 months into their first tour, followed by Department Head (DH)

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qualification (KG0) by 24 months into their second. Prior to successfully completing EOD warfare requirements and receiving the 1140 designation, NEOD officers are designated as 1190 and are considered EOD officers "in training." Once 1140 qualified and successfully screened DH, fully qualified lieutenants are eligible for the ORB as an incentive to remain in active service. While estimating the Navy's investment in each EOD officer is difficult as it can vary significantly by one's career, number of assignments, physical location, and mission set, at 8 YCS, the Navy's investment in each individual EOD officer is substantial and likely exceeds two million dollars (R. Frew, email to author, April 11, 2022).
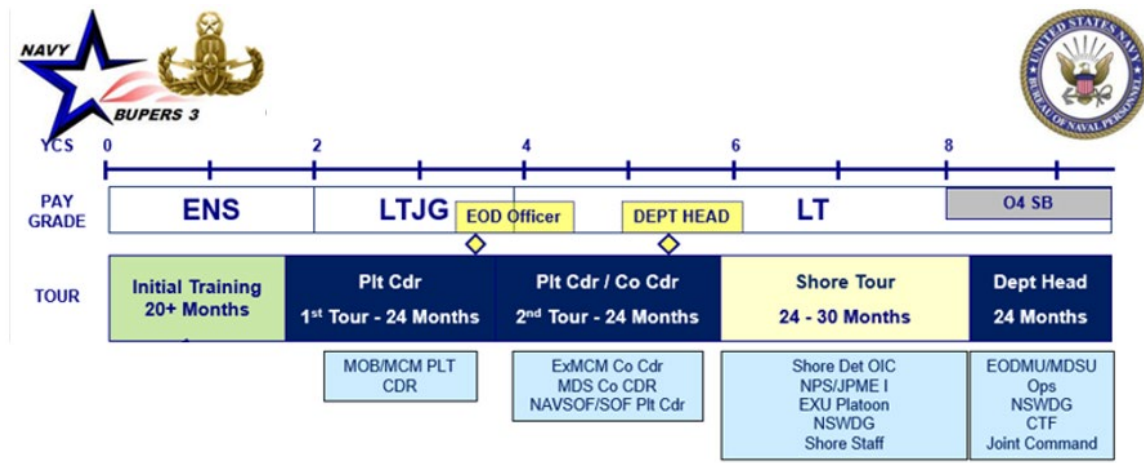
Figure 2.   EOD Officer Career Path.
Source: USN (n.d.).

E.   REVIEW OF EOD BONUS

In 2005, in accordance with DOD Instruction 1304.34, General Bonus Authority for Officers, a memorandum was signed that designated Naval Special Operations Officers (EOD) as "critical" (OUSD, 2005). This designation made all qualified 114X officers eligible for a Critical Skills Retention Bonus (CSRB). The CSRB was seen as a force shaping initiative specifically targeting post-Department Head (8-10 YCS) Special Operations officers qualified in EOD to influence historically poor retention among senior lieutenants and lieutenant commander inventory shortfalls. (OUSD, 2005). The payout

structure for eligible Special Operations officers was detailed in OUSD's (2005) memorandum as follows:

3-year commitment: Annual installments of $25,000/yr ($75,000 total)

2-year commitment: Annual installments of $20,000/yr ($40,000 total)

In 2015, with the release of NAVADMIN 101/15, the CSRB changed to the Officer Retention Bonus (ORB) for qualified EOD officers because retaining EOD Warfare Officers continued to be "a top priority for the Navy" (Office of the Chief of Naval Operations [CNO], 2015, para. 2). While the naming convention was changed the force shaping initiative remained the same, to provide an adequate population of officers for EOD Warfare LCDR and CDR billets (Assistant Secretary of the Navy for Manpower and Reserve Affairs [ASN M&RA], 2020). "To maintain a healthy control grade inventory, the EOD ORB targets retention of 22 LTs per YG through YCS 11 and 16 LCDRs per YG through YCS 15" (J. Damon, email to author, December 12, 2021). The LT ORB payout structure for eligible EOD officers is as follows:

4-year commitment: Annual installments of $20,000/yr ($80,000 total)

3-year commitment: Annual installments of $15,000/yr ($45,000 total)

Lieutenant bonus details are as follows: "the 4-year LT ORB ($80K) is offered to eligible EOD Warfare Officers (warfare qualified (KG5) and EOD Department Head qualified (KG0)) at YCS 7…officers who are undecided at YCS 7 or become eligible after YCS 8 (but before YCS 9) are offered the 3-year LT ORB ($45K)" (J. Damon, email to author, December 12, 2021). Both the 4-year and 3-year LT bonuses commit officers through YCS 11, contracting them through their statutory screenings for LCDR and their first and second administrative screen boards for EOD Warfare Executive Officer (J. Damon, email to author, December 12, 2021). The LCDR ORB is a 3-year contract ($46K) that can be taken at YCS 12 and officers are committed through YCS 15, ensuring retention through their statutory screening to CDR and their first administrative screening board for CDR Command (J. Damon, email to author, December 12, 2021). Table 1 provides a breakdown of the 4-year LT bonus.

Table 1. Summary of Changes to 4-Year LT Bonus.
Adapted from OUSD (2005) and CNO (2015).

	CSRB	ORB	Delta
Years in effect	2005 – 2015	2015 – Present	
Payment	$75,000 max (Paid in equal installments of $25k)	$80,000 max (Paid in equal installments of $20k)	$5,000
Commitment	3 Years	4 Years	1 Year

1. CSRB/ORB Impact on Retention

Historically, the CSRB/ORB has proven to be an effective retention tool as evident by the increase in retention rates. On average, post-ORB implementation YGs saw approximately a 10 percent increase in retention. Table 2 "ORB Performance" summarizes the pre/post bonus implementation impact.

Table 2. ORB Performance.
Source: J. Damon, email to author, October 28, 2021.

	Avg % retained at 7YSC	Avg % retained at 8YSC	Avg % retained at 12YSC		Avg % retained at 13YSC
Pre-ORB	61%	55%	32%		31%
Post-ORB	73%	62%	44%		42%

2. CSRB/ORB Effective Take Rate

Despite the CSRB being implemented in 2005, the earliest "take rate" data available began in 2014 with YG 2007. Despite the limitations in data, it is apparent that the CSRB/ORB is waning in attractiveness as the bonus has experienced very little change in amount and payment structure since inception. This decreasing trend in take rate is illustrated below in Figure 3. Based on conversations with the NEOD community manager a targeted take rate of 75 percent would provide a healthy inventory of senior lieutenants.

	YG 07	YG 08	YG 09	YG 10	YG 11	YG 12	YG 13	YG 14
Eligible	27	21	31	23	25	26	30	27
Contracts	21	17	21	14	19	12	16	14
Take Rate	78%	81%	68%	61%	76%	46%	53%	52%
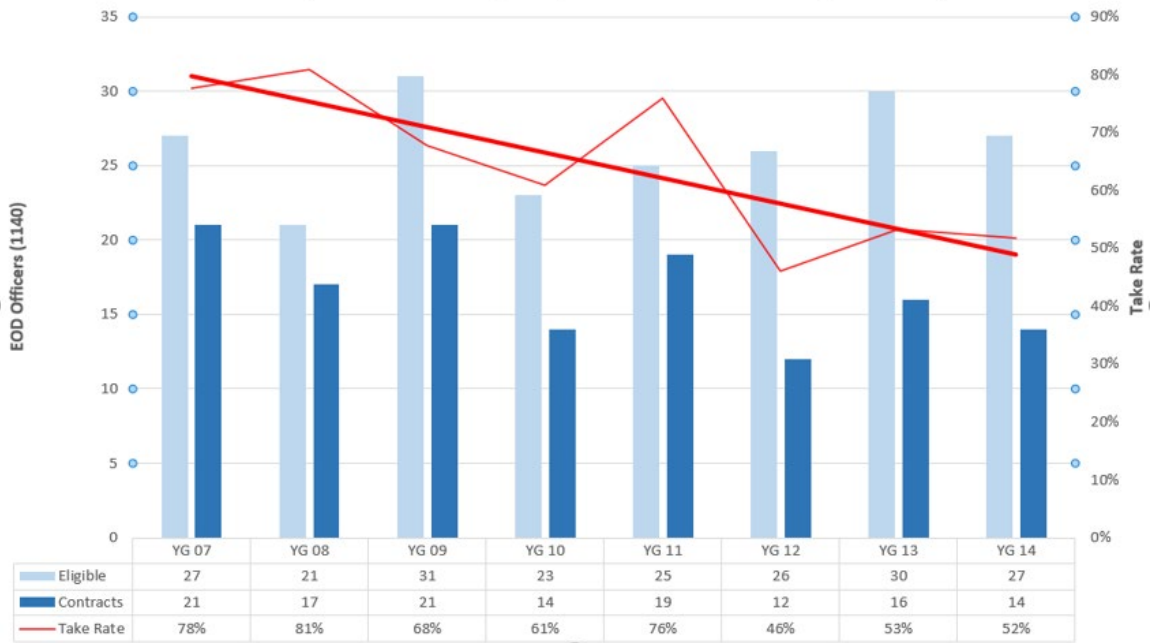
Figure 3.   EOD Department Head Eligible, Contracts, and Take Rate by Year
Group. Source: J. Damon, email to author, October 28, 2021.

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II. LITERATURE REVIEW

A. REVIEW OF NAVAL OFFICER RETENTION

Guy Snodgrass outlined officer retention issues across the Navy in his work, *Keep a Weather Eye on the Horizon: A Navy Officer Retention Study*. He found that a combination of high operational tempo, ever-increasing deployment lengths, improving economy, and erosion of trust in senior leadership (admin, 2014) all significantly contributed to a mass exodus of Naval officers across the "surface, submarine, aviation, SEAL (special warfare), and Explosive Ordnance Disposal" (p. 4) communities and was likely to worsen in future years (Snodgrass, 2014). Although many of these circumstances have changed since publishing due primarily to the drawdown of troops involved in the War on Terror and subsequent exit from Afghanistan, he also points out that the opportunity to "participate in real-world operations in the Middle East [was] one of the most powerful factors keeping quality officers in the Navy" (admin, 2014).

In his article, he supports his thesis by studying the "take rate" of department-head bonuses in the aviation community and notes a significant departure from the target rate is needed to ensure community health. He then makes the case that CSRBs that had been suspended in accordance with the Budget Control Act and sequestration should be re-instated as the improving economy as measured by an increase in U.S. gross domestic product (GDP) and shrinking unemployment offered significant opportunities for quality officers to leave the military and participate in the civilian workforce.

B. REVIEW OF NAVY EOD OFFICER RETENTION

In Mark Gutierrez's (2016) prior work, *Military Retention: a holistic approach to understanding officer separation in the Navy Explosive Ordnance community* he found the top four reasons NEOD officers decide to separate are: "family stability, leadership, military bureaucracy, and limited operational time" (Gutierrez, 2016, p. V). While he also identified the manning shortfall at the eight-to-ten-year mark and touched on the implementation of the CSRB as an attempt to curtail losses, he concluded that leadership

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should focus their efforts on the factor they can most readily influence—extending the operational time for NEOD officers.

Gutierrez's work is largely complementary to this project as he relied on a survey organized by Navy Personnel Command (NPC) and conducted by the Navy Personnel Research, Studies, and Technology (NPRST) division in 2016. The survey was administered to active duty NEOD officers and aimed to "identify major grievances within the EOD officer community" (Gutierrez, 2016, p.27). His work focused on only two of the open-ended questions: "If you could change one thing about the EOD community, what would it be?" (Gutierrez, 2016, p. 11) and a free response block offering space to provide any additional comments the survey participant deemed worthy (Gutierrez, 2016). His methodology for categorizing and coding survey responses followed a three-step process. The responses to each question were read three times, the goal of the first reading was to determine broad patterns, the second "pass" was to identify "trends within trends" also known as axial coding, and the third reading sought to combine these trends and responses (Gutierrez, 2016). As previously mentioned, the top responses did not focus specifically on the financial incentives available to NEOD officers, but a minority of survey participants did mention that the CSRB/ORB was a consideration in their separation decision process.

C.   MODELING RETENTION

1.   BONUS IMPACTS ON SOF RETENTION

In *Assessing Retention and Special and Incentive Pays for Army and Navy Commissioned Officers in the Special Operations Forces* Asch, Mattock, Hosek, and Nataraj, used RAND's "Dynamic Retention Model (DRM) as the analytical basis for relating special and incentive (S&I) pay to retention" (Asch et al., 2019, p. IX). Although their report specifically excluded Navy EOD officers in part due to the community's organization under the Naval Expeditionary Combatant Command (NECC) as opposed to Special Operations Command (SOCOM), they found statistically significant linkages between an increase in S&I pays, specifically a CSRB, and retention (Asch et al., 2019).

Their findings detailed that introducing a CSRB program to Army Special Operations Forces (SOF) officers would have a "large effect on steady-state retention, increasing the size of the SOF officer force by 10.6 percent" (Asch et al., 2019, p. X.) For the Navy, their findings indicated that an increase in the CSRB currently offered by 25 percent would increase the steady-state Navy SOF force by 3.7 percent, with the majority of that retention occurring "between 15 and 26 YOS, when members are eligible to receive the CSRB" (Asch et al., 2019, p. X).

These findings relate well with the NEOD officer community as there are many parallels. While we differ in expertise, a significant amount of the NEOD force supports various SOF components and as such undergoes much of the same training, possesses many of the same mobility requirements, and as a result is compensated with many of the same special pays (dive, jump, demolition, etc.). A major difference is the ORB is currently offered to NEOD officers at 7 YCS whereas the DRM model utilized data for NAVSOF officers who were not eligible until 15 YOS. This indicates that many of the NAVSOF officers would have already decided to stay in to retirement thus an increase in the ORB amount by 25 percent would likely result in a much higher retention rate for NEOD officers.

2.   BONUS IMPACTS ON AVIATION RETENTION

In 1996, Riebel developed and published "an analysis of the effects of increases in aviation bonuses on the retention of Naval Aviators using an annualized cost of leaving (ACOL) approach" (1996, p. 1). Specifically, using logistic regression, his ACOL model attempted to "predict Naval aviator separation decisions in response to changes in aviation bonus pays –Aviation Continuation Pay (ACP) and Aviation Career Incentive Pay (ACIP)" (Riebel, 1996, p. V). His approach modeled an "individual's decision to stay or leave the military based on the monetary differences" (p. V) between expected military pay and expected civilian pay in which he characterizes as the "cost-of-leaving." He used various database pulls to "determine individual characteristics and compute a present value of expected military pay stream" (Riebel, 1996, p. V). He then characterized potential civilian earnings using data from the Census Bureau to estimate future expected civilian earnings.

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In an attempt to capture "non-monetary" factors that impact an individual's decision to stay in the military or separate, Reibel constructed various demographic variables that included marital status, number of dependents, and racial minority status. To determine the impact of each variable, he used a "notional person" approach and set the values equal to the mean for continuous variables and either a "1" or "0" for dichotomous/ dummy variables (Riebel, 1996). Holding all else constant, he then manipulated one variable at a time and noted the difference between the notional value and the "new" value.

Using logistic regression, he was able to model and simulate Naval aviator retention in response to changes in ACOL by manipulating aviation bonus (ACIP, ACP) amounts. His results indicated the proposed increases in bonus pays were a "cost-effective way [to increase] the retention of Naval aviators" (Riebel, 1996, p. 38).

While his work focused on a different community with different bonus requirements and payment structure, his methodology surrounding the use of logistic regression matches the intent of this project well. Part of his research focused on the implications of aviators accepting a long-term contract designed to obligate an aviator "long enough to fill the critical mid-grade LCDR shortage" (Riebel, 1996, p. 13). One key difference, is that pilots in the military have a skillset that directly translates to the civilian sector, commercial airline pilot, and thus potential civilian income is readily available and relatively easy to model.

D.   LOGIT REGRESSION

Logit regression, (also called logistic regression) is a regression method used to estimate the probability of an outcome given various inputs. The outcome typically belongs to a particular class defined as either a "1" or a "0." This discrete output makes logit regression a binary classifier (Géron, 2019). "Logistic regression analyses yield powerful insights in to what attributes (i.e., variables) are more or less likely to predict event outcome in a population of interest" (Karp, n d., para. 1). Additionally, these models "show the extent to which changes in the values of the attributes may increase or decrease the predicted probability of event outcome" (Karp, n.d, para. 1). In short, this type of analysis assists in predicting the likelihood of an event happening or a choice being made. Logit

regressions have widespread utility and have historically been used across industry to predict customer retention, probability of defaulting on a mortgage, how a person is likely to vote, predict the risk of developing a given disease etc. Logistic regression equations can be represented as Equation 2.1 (Sharma, 2021):

$$p(X) = e^{B_0 + B_1 X_1 + B_2 X_{2} + \dots B p X p} \Big/ e^{\left(B_0 + B_1 X_1 + B_2 X_{2} + \dots B p X p \right)} + 1$$

where: p(X) = probability of a decision being made.

Logistic regression is well suited to model predicted "take" decisions of NEOD officers eligible for the ORB given their choice is binary, they either take the bonus or they do not.

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III. DATA AND METHODOLOGY

A. DESCRIPTION OF DATA

Data for this project drew primarily from three sources; NEOD officer community manager data pulls from the Officer Personnel Information System (OPINS) and Officer Assignment Information System (OAIS) repositories as well as a survey that was administered to former Navy EOD officers open to all year groups.

1. Survey Data

The invitation to participate in the survey was sent to 104 former NEOD officers and 52 (50.0%) elected to provide their input, resulting in an overall sample size of 52 (N=52). Responses covered various YGs and ranged from 1990 to 2017. While more responses would likely provide further fidelity, the relatively small sample size is sufficient to provide significant statistical analysis as the number of responses received exceed the generally accepted minimal observation size of 30 (Hogg, 2015). The reason for the small sample size is primarily due to the fact the NEOD community is very small and finding current contact information for former NEOD officers, a subset of a small community proved to be problematic. The survey consisted of 32 questions covering a range of topics grouped into five categories: NEOD career history, education, post-navy work experience, financial, and community/work-life balance. Following the methodology of Gutierrez, survey responses to open-ended questions were read three times and "coded" accordingly to identify major trends and broad patterns. Specific survey questions and a summary of aggregated total responses are available in Appendix A and Appendix B respectively. As previously mentioned, responses were recorded from participants across multiple year groups. Table 3 summarizes these responses by YG.

Table 3.   Survey Responses by Year Group (YG)

YG	Number of respondents
1990	1
1994	1
1999	1
2000	0
2001	2
2002	2
2003	4
2004	1
2005	1
2006	6
2007	3
2008	3
2009	8
2010	3
2011	2
2012	5
2013	0
2014	6
2015	2
2017	1
Total	**52**

a.   *Determining Earnings Potential Outside of the Navy*

Specific financial questions were chosen to determine potential earnings outside of the Navy both immediately after separation (i.e., salary and bonuses) and today to capture future earnings potential. Table 4 provides a summary of the survey data relevant to potential earnings outside of Naval service (i.e., participant's annual salaries, both at their first post-Navy job and today, average bonus amount offered, number of jobs since separating, etc.). To corroborate the earnings potential outside of the Navy, the survey data was then used to perform searches on the Bureau of Labor Statistic (BLS) website and reports of recent college graduates' earnings potential.

Of the 52 responses, 44 readily provided annual salary information. However, multiple participants indicated they were unwilling to disclose their current salary (3), currently unemployed (2), currently a student (1) or their compensation was purely equity based (2). For simplicity, these members responses were removed when calculating

average salaries. Based on salary responses from 44 participants, on average, NEOD officers separating from the Navy can expect to earn $105,173 in annual salary at their first post-Navy job. Additionally, 38.5 percent of respondents were offered a signing bonus with an average value of $17,375. Approximately, seven years after separating from the Navy, NEOD officers can also expect to earn, on average, $164,589. These estimations are likely conservative as several (3) participants indicated they are compensated via equity in addition to their salary. Due to the anonymity of the survey, this additional equity compensation was not possible to calculate.

Table 4.   Summary of Earnings Survey Data

Avg. length of service (YRS)	7.7
Avg. time since separation (YRS)	6.8
Avg. number of jobs since separation	1.9
Avg. starting salary (1st Post-Navy job)	$105,173.30
Avg. signing bonus (1st Post-Navy job)	$17,375.00
NEOD Officer's that received a signing bonus (%)	38.5%
Avg. current annual salary (Current)	$164,589.77

b.   *Educational Background*

According to Torpey (2018), the relationship between education and earnings potential can be difficult to quantify, however, "U.S. Bureau of Labor Statistics (BLS) data consistently show that … the more you learn, the more you earn" (paras. 1–2). As one's educational background significantly contributes to the positions and fields of work available for officers when separating, survey participants were asked to provide details on degrees awarded and level of education achieved both prior to joining the Navy and at time

of separation from active service. While salaries and career field opportunities vary greatly depending on one's type and level of education, NEOD officers typically have a technical undergraduate degree 28 (54%) and 25 (48%) of participants indicated that they had obtained a master's degree or higher when they separated from active service. Figures 4 and 5 summarize NEOD survey participants' education levels by discipline.

According to data from Bankrate, new college graduates with STEM degrees are the most valuable and "make up every one of the top 25 degrees in our study, with engineering degrees claiming eight of the top 10 spots and 14 of the top 20 spots" (Ostrowski, 2021, para. 6). According to their data, the top 25 majors by pay and demand are all in "STEM" and had a median income of $93,000 (Masterson, 2021). Comparatively, the "median income for all Americans holding at least a bachelor's degree in 2019 was $54,000" (Ostrowski, 2021, para. 15). NEOD officers, given their tendency to have a technical educational background coupled with leadership and management expertise acquired while serving on active-duty, are likely to be in high demand outside of the Navy and therefore their average starting salary is likely to exceed $93,000. Anecdotally, when prior NEOD officers were asked what military experience was most marketable, 64 percent of participants indicated leadership and 31 percent indicated their management experience.

Bachelor's Degree by Discipline

Discipline	Count
Business/Economics	8
STEM	28
Social Science	10
Liberal Arts	1
Unknown	5
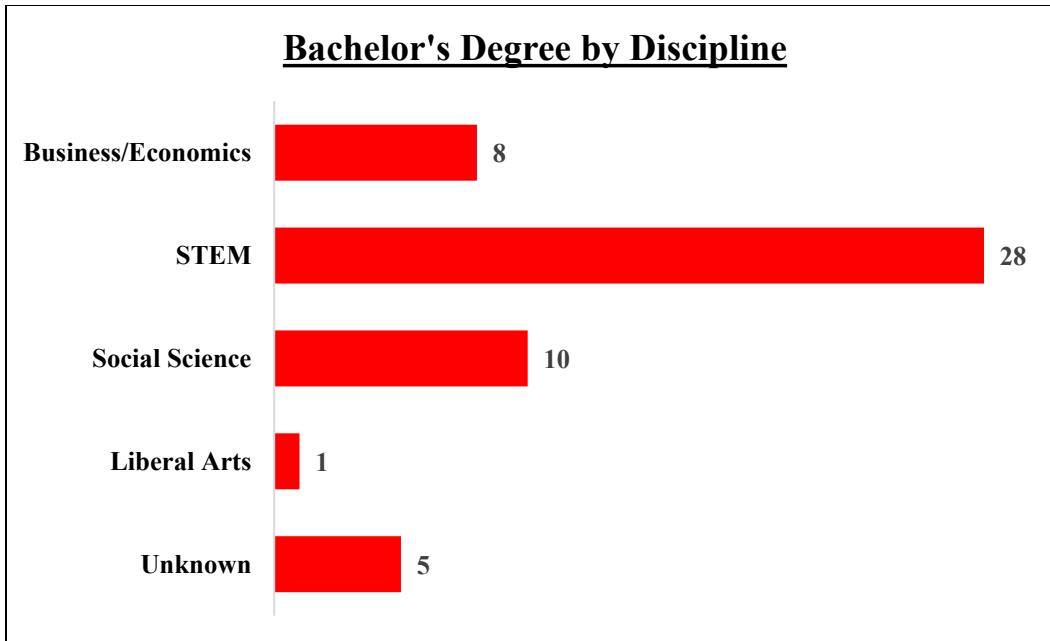
STEM includes: All Science, Technology, Engineering, and Mathematics degrees.

Figure 4.   Summary of Surveyed Education (Bachelor's)

Master's Degree by Discipline

Discipline	Count
Security Management	1
Robotics	1
Public Policy	2
National Security Studies	1
MBA	7
Leadership	1
International Relations	1
Entrepreneurship	1
Engineering	3
Economics	1
Business	5
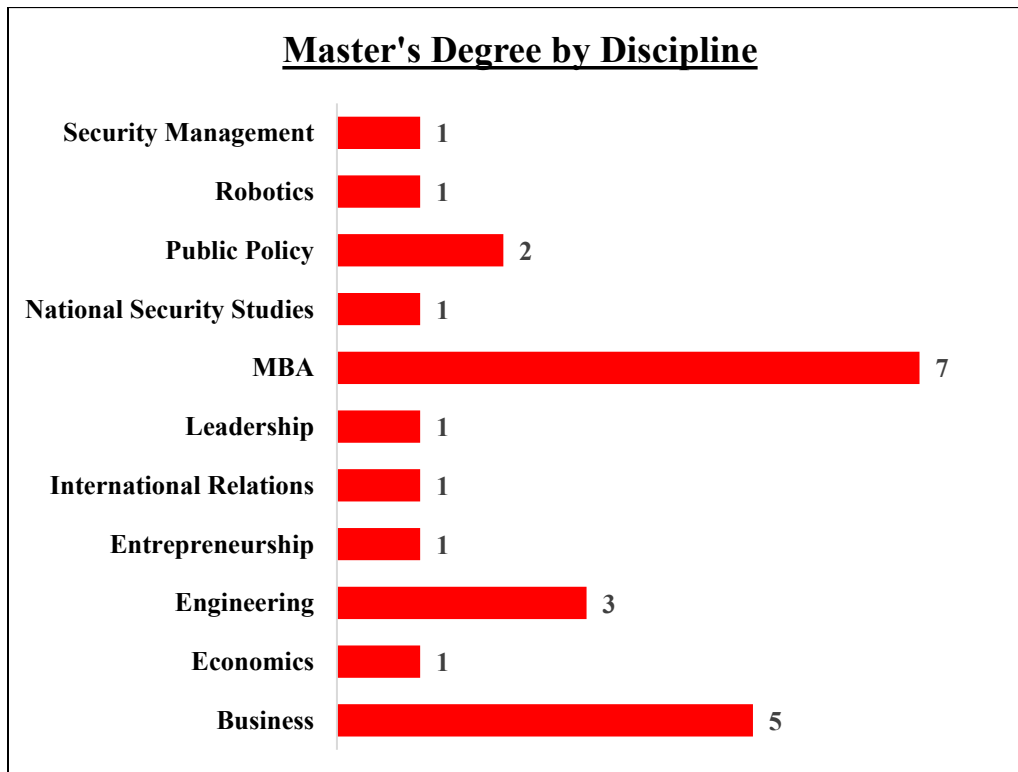
Figure 5.   Summary of Surveyed Education (Master's)

c.   Likely Career Fields

Survey participants were also asked to provide the industry in which they worked immediately after separation, their job title, and position as well as the industry and job title/ position at their current employer. Appendix B shows aggregated survey responses of specific job titles and positions. Figure 6 provides a summary of participants first post-Navy jobs by industry. For ease, multiple industries were combined in a single category. For example, if a participant indicated they worked in "information technology" their response was grouped under the generic label of "Technology."
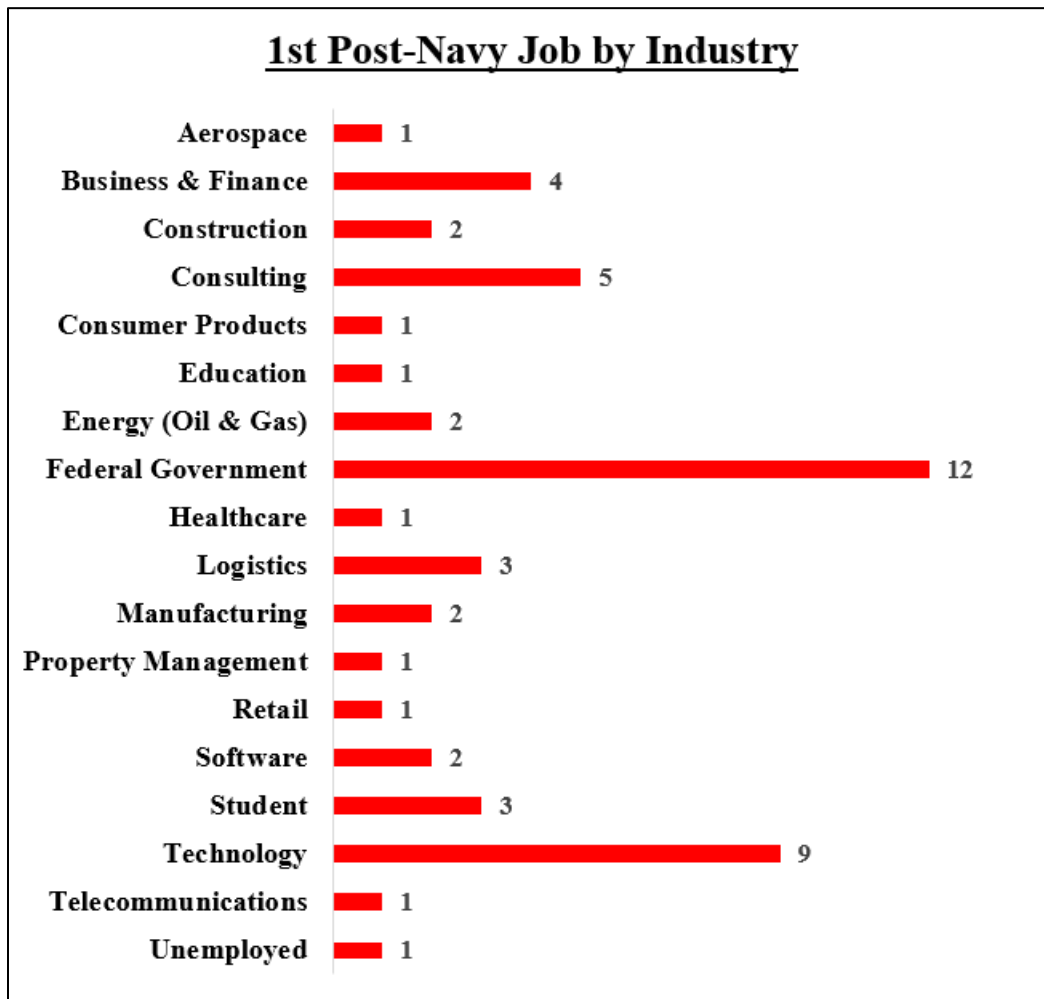
Federal Government includes: FBI, State Dept, Forest Service, Full-Time Support, and Contracting

Figure 6.   Summary of Surveyed Career Fields

2. OPINS/OAIS Data

Database data pulls from OPINS and OAIS were performed by the NEOD community manager for EOD officers at 7 YCS, eligible for the ORB, and spanned YGs 2007 to 2014. These two datasets were merged to yield a final dataset and sample size consisting of 212 total observations. Total observations are summarized by YG in Table 5. These observations are further broken down by demographic variable and summarized in Table 6. Of those eligible, 136 (64.15%) were contracted. The mean population for each YG was 26.5 observations. As previously mentioned, with an average of 33 officer accessions each year, the community simply does not have large population sets to analyze. While additional observations would be ideal to ensure minimum population size standards for statistical analysis are met, this is an inherent issue due to the small size of the community. In addition to YG and contracting status and various demographic variables to include: marital status, number of dependents, gender, age, race, commissioning source, and some education data were available.

Table 5.   Observations by Year Group

YG	Number of respondents
2007	28
2008	21
2009	31
2010	25
2011	25
2012	25
2013	29
2014	28
Total	**212**

Table 6.   Summary of OPINS/OAIS Data by Variable

	Total Population Sample	Contracted	Non-contracted
Average Age	**31.9**	32.5	30.8
With Dependents	**74 *(34.9%)***	*60 (81.1%)*	*14 (18.9%)*
Gender: Male	**209 *(98.6%)*** **3 *(1.4%)***	134 *(64.1%)* 2 *(66.7%)*	75 *(35.9%)* 1 *(33.3%)*

21

	Total Population Sample	Contracted	Non-contracted
Female			
Marital status:			
Married	**157 *(74.1%)***	113 *(71.9%)*	44 *(28.1%)*
Unmarried	**48 *(22.6%)***	19 *(39.6%)*	29 *(60.4%)*
Unknown	**7 *(3.3%)***	4 *(57.1%)*	3 *(42.9%)*
Race:			
American Indian	**2 *(.9%)***	1 *(50.0%)*	1 *(50.0%)*
Asian	**7 *(3.3%)***	5 *(71.4%)*	2 *(28.6%)*
Black/African American	**3 *(1.4%)***	3 *(100.0%)*	0 *(0.0%)*
White	**185 *(87.3%)***	120 *(64.9%)*	65 *(35.1%)*
Multiple	**5 *(2.4%)***	2 *(40.0%)*	3 *(60.0%)*
Declined to respond	**10 *(4.7%)***	5 *(50.0%)*	5 *(50.0%)*
Commissioning Source:			
USNA			
ROTC			
OCS	**100 *(47.2%)***	57 *(57.0%)*	43 *(43.0%)*
STA-21	**59 *(27.8%)***	35 *(59.3%)*	24 *(40.7%)*
Other*	**19 *(9.0%)***	17 *(89.5%)*	2 *(10.5%)*
*Includes merchant marine	**30 *(14.2%)***	25 *(83.3%)*	5 *(16.7%)*
and lateral transfers	**4 *(1.9%)***	2 *(50.0%)*	5 *(50.0%)*
Sample Size	**212 (100%)**	136 (64.2%)	76 (35.8%)

B.   MODEL DEVELOPMENT

The logit regression model follows various literature reviewed in Chapter II and incorporates an ORB bonus to non-Navy earnings (BTE) ratio to explain taking the bonus and separation decisions of Navy EOD officers. The variables used in this analysis are outlined below and resemble Riebel's setup. These variables were assumed to have significant influence on a NEOD officer's decision to take the bonus and stay or separate from the Navy at 7 YCS. While the vast majority of NEOD officers who decide to stay in past 7 YCS do take the ORB and continue their service this is not the case in all situations.

1.   Variable Construction and Definitions

a.   The Dependent Variable

The dependent variable, defined as "TAKE," or the probability an officer will accept the bonus, was constructed using the contracted status in the final dataset. If an

individual EOD officer at 7 YCS had taken the bonus, then TAKE was coded "1." If that individual EOD officer had not contracted, TAKE was coded as "0."

b. Calculation of the Bonus to Earnings (BTE) Ratio Variable

Similar to Reibel's approach outlined in section II, to compute the Bonus to Earnings (BTE) ratio, it was assumed that individual EOD officers at 7 YCS consider their immediate earnings potential outside of the Navy and weigh that against their financial incentives (ORB) to remain on active duty in the EOD community. The denominator of the ratio was the average earnings ($105,173.30) identified from the survey results of prior EOD officers. While the survey assisted in understanding what NEOD officers actually earn outside of the Navy, not enough observations in each year group were observed to do this on a YG basis and instead used the average starting annual salary across all observations. To remain conservative in estimations, signing bonus and equity compensation data from survey participants was not incorporated into the earnings calculation. The numerator of the ratio was the ORB amount offered. To ensure the bonus and earnings amounts stayed relative to each other, the ORB amount was adjusted for inflation to compute a "real" bonus amount in the year in which that officer was making their decision. 2014 and 2015 ORB amounts were kept in nominal terms as take rate data prior to 2014 was not available and 2015 was the first year the $80,000 ORB was offered. Inflation adjustment was applied to the years thereafter. ORB amounts were adjusted for inflation using Consumer Price Index data for all urban consumers (CPI-U) from the U.S. Bureau of Labor Statistics website. Cumulative inflation from 2016 to 2021 was approximately 13.6 percent (Bureau of Labor Statistics [BLS], n.d.). Annual inflation rates and "real" ORB bonus amounts are illustrated below in Table 7.

Table 7.   ORB Amounts Adjusted for Inflation.
Adapted from Bureau of Labor Statistics (2022)

Year	Nominal ORB Amount	Inflation Rate	"Real" ORB Amount
2014	$75,000	N/A	$75,000
2015	$80,000	N/A	$80,000
2016	$80,000	2.2%	$78,278
2017	$80,000	1.8%	$76,894
2018	$80,000	2.1%	$75,312
2019	$80,000	2.2%	$73,691
2020	$80,000	1.7%	$72,459
2021	$80,000	3.6%	$69,941

c.   Unemployment Rate (UR) Variable

The U.S. unemployment rate data was included in the regression as it is assumed macro-economic factors in a given year can impact an officer's decision to take the bonus and remain on active duty. This data was taken from the Bureau of Labor Statistics website and used the unemployment rate for the year in which the officer was making their decision. Unemployment rates ranged from 6.2 percent in 2014 to 5.3 percent in 2021 and averaged 5.3 percent across that timespan. (BLS, n.d.).

d.   Demographic Variables

Demographic variables were included in the model to capture a more holistic view of non-monetary factors affecting an individual decision to stay in (i.e., an individual with dependents would likely value career stability over potential higher income and thus opt to take the ORB). The sections that follow describe the construction of the demographic variables and their assumed impact on "take" decisions.

(1)   Marital Status (MARSTAT).

The MARSTAT variable indicates marital status of an individual. Married individuals were coded as "1" and unmarried were coded as "0." As Table 4 illustrated, being married appears to have a positive correlation with the take decision as 71.9 percent of participant who were married chose to take the bonus. The underlying dataset did not provide marital status information for seven of the observations. Rather than deleting this

data, marital status was computed for the seven consistent with the relative percentages of married/ unmarried observed in the entire dataset. For example, approximately 74 percent of officers were married at 7YCS. Thus, five of the seven missing marital status information or 71 percent were coded as a "1" and two were coded as a "0."

(2)   Dependents (DEP).

The DEP represents dependents in addition to a spouse. It is assumed that an officer with dependents is more likely to take the bonus and continue to serve. Because DOD automatically defines a spouse as a dependent, much of this variable's value would be redundant of the value captured via MARSTAT. To assist in determining dependent impacts on take rate decisions outside of a spouse, this variable was coded as a "1" for any dependent number greater than "1." For any servicemember unmarried or married with no children the value was coded as "0." Again, this assumption is reinforced by the data shown in Table 6 as service members with dependents took the bonus at significantly higher rates. Similar to issues with the MARSTAT data, seven of the observations did not have dependent data recorded. These data gaps were filled in the same manner as the MARSTAT missing data and kept the relative percentages of those with and without dependents consistent with the overall dataset.

(3)   Commissioning Source (CS).

CS or commissioning source was included as Seaman to Admiral (STA-21) and Officer Candidate School (OCS) commissioned EOD officers are likely more inclined to take the bonus then those who commissioned via the Naval Academy or ROTC. This is primarily due to the fact that the vast majority of OCS candidates and all of STA-21 who commission as EOD are prior enlisted and thus it is assumed they are more likely to stay until retirement. This data was coded as "1" or "0" on an individual basis and utilized "dummy" variables for other commissioning sources.

(4)   Age (AGE).

AGE was included in the regression as it is assumed officers who are older are more likely to stick with their current career track rather than leave the Navy and start a new

career. This data was treated as continuous and therefore was not recoded into a binary format.

Due to the relatively small sample size (212), specific demographic variables that did not have enough observations to glean statistically meaningful results were excluded. These variables included gender and race.

C.   MODEL SPECIFICATIONS

Given the variables as defined above, a Navy EOD officer's decision to take the bonus and remain on active duty through 11 YCS is expressed using the following logistic equation:

Equation 3.1, adapted from Soureshjani, Kimiagari (2013):

$$ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = B_0 + B_1BTE + B_2MARSTAT + B_3DEP + B_4CS + B_5AGE + B_6UR$$

where $TAKE = \hat{p} = e^{B_0+B_1X_1+B_2X_2+...BpXp}$ / $e^{(B_0+B_1X_1+B_2X_2+...BpXp)} + 1$

IV. EMPIRICAL RESULTS

This chapter presents the methods used and provides a summary of empirical analysis results.

A. METHODS

Given the variables and equation (equation 3.1) outlined in section III, the logistic regression was run using the Real Statistics Resource Pack add-in in Microsoft Excel. Once statistical significance (p-values) and coefficients were determined, equation 3.1 was then used to predict take rates in response to hypothetical changes in the officer retention bonus amount being offered. This change in bonus amount directly impacted the "BTE" ratio. All other independent coefficients were multiplied by the mean value from the dataset and kept constant across various changes in the bonus amount. Thus, the probability of a NEOD officer "taking" the bonus is predicted using the logistic model (equation 3.1) and manipulating the "B" or bonus amount offered (Riebel, 1996).

In Riebel's work, he pointed out that logit model coefficients are different from those of a linear probability model in that logit coefficients are "difficult to interpret" (Ranganathan et al., 2017, para.7). Rather than representing the probability of an outcome given a "one unit increase in an independent variable" (Riebel, 1996, p.24), the coefficients in a logit model represent the "logarithm of the odds ratio of the dependent variable" (Riebel, 1996, p.24). Thus, to interpret the impact individual variables have on "TAKE" decisions, the same "notional person" approach as outlined by Riebel (1996) was used. To do this, all coefficients in the model were held constant and only the individual variable being tested was manipulated. Responses were then recorded given the differences in probability of the "TAKE" decision.

B. RESULTS OF MODEL

After running the regression, the model showed an accuracy of approximately 84.6 percent in predicting success (an individual who took the bonus) and 40.7 percent accuracy predicting failure (an individual who rejected the bonus) for a total combined

accuracy of 68.9 percent at a cutoff value of 0.5 and a 95 percent confidence level (alpha = .05). The standard cutoff value of 0.5 was used as this represents the "minimum probability that would be considered positive" (*Graphpad*, n.d.) in other words, "if the predicted probability is greater than .5, that observation is classified as positive" (Graphpad, n.d.). Figure 7 depicts the receiver operating characteristic (ROC) curve, a "plot of the true positive rate against the false positive rate" (Glen, 2016) for the model. Complete regression results are available in Appendix C.
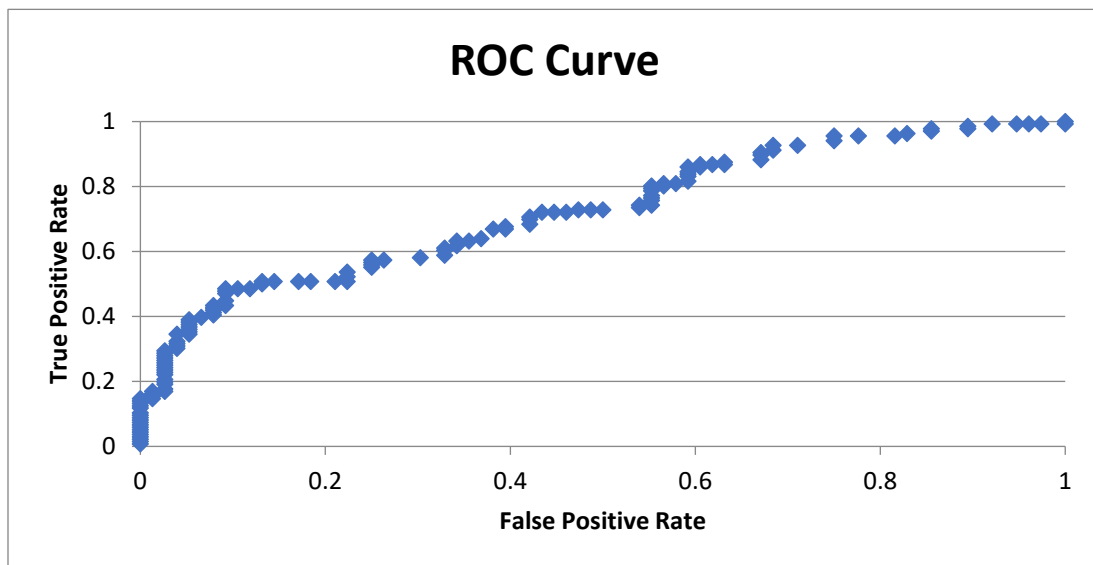

Figure 7.   Regression Results ROC Curve

Table 8 provides a summary of the predicted take rate decision given the mean or average values for each variable at the current ORB offered, adjusted for inflation.

Table 8.   Predicted Take Rate Given Current ORB* ($69,941)

Variables	Coefficients	P-Values	Mean Values
Intercept	-6.236341778	0.286251885	1
BTE**	12.46665517	0.033540237	0.671
Marital Status**	0.915396822	0.014488318	0.741
Dependents (Children)**	0.820935905	0.043311727	0.349
CS (USNA)	0.369964171	0.73096328	0.472
CS (ROTC)	0.519491387	0.634463285	0.278
CS (OCS)	2.918003036	0.071618219	0.09
CS (STA-21)	2.192141102	0.13458381	0.142
Age	-0.119625053	0.348538614	31.9
Unemployment Rate	-1.368041686	0.913001707	0.053
Predicted Probability of "Take" Decision			**52.3%**

*Adjusted for inflation (2015-2021)

** Significant at a 95% confidence level

C.   EFFECTS OF VARIABLES ON TAKE DECISIONS

The effects of the various independent variables previously outlined in section III: unemployment rate, marital status, dependents, commissioning source, and age, on take decisions are examined below. The Bonus to Earnings (BTE) variable is discussed later in paragraph D. Logistic regression results in their entirety are available in Appendix C. The impact of each individual variable was determined by keeping all terms constant and manipulating variables from "0" to "1" and recording the differences in probabilities.

(1)   Effect of Unemployment Rate (UR)

According to the logistic regression results, the unemployment rate is not a good predictor of TAKE decisions and was not found to be statistically significant at the 95 percent significance level. The unemployment rate was negatively correlated with the data, which is counterintuitive to the expected result. As unemployment goes up, it was assumed that NEOD officers would be more likely to stay in the military given a preference for stability. One explanation for this result is that the number of observations in each year may be too limited to match to macroeconomic events.

(2)   Effect of Marital Status (MARSTAT)

As predicted, NEOD officers who are married are significantly more likely to take the bonus and MARSTAT is therefore a good predictor of TAKE decisions as it was found to be statistically significant. Directionally, keeping all other variables constant and changing the notional value from a "0" (unmarried) to "1" (married) resulted in an increase in the predicted probability of taking the bonus by 22.4 percent.

(3)   Effect of Dependents (DEP)

The impact of dependents (in addition to a spouse) was found to be statistically significant at the 95 percent confidence level as those with children took the bonus at significantly higher percentages then those without. This result was expected given it intuitively makes sense that officers with dependents are less flexible in their career and therefore more likely to choose stability. This intuition was supported by the regression results as recoding DEP from "0" (no dependents) to "1" (has dependents) resulted in a 20 percent increase in the predicted probability of taking the bonus.

(4)   Effect of Commissioning Source (CS)

Commissioning sources across the board were not statistically significant although as previously predicted, those who commission via OCS and STA-21 are significantly more likely to take the bonus and remain in active service as indicated by their "p-values." To find the estimated impact of CS on the take decision, one CS was coded as "1" and the rest '0." This process was done for each commission source and the impact on the estimated probability of taking the bonus are as follows: USNA (9.2%), ROTC (12%), OCS (58.4%), and finally STA-21 (49.1%).

(5)   Effect of Age (AGE)

Age's impact on take decisions was anticipated to have a positive correlation (i.e., an increase in age results in a higher instance of bonus takers) with take decisions however, the regression results show a slightly negative correlation. Given the small sample size and small range of ages, it is possible this result was due to a lack of extensive data but

regardless, a one-year increase in age resulted in a -2.5 percent probability of taking the bonus. Age was not found to be statistically significant at the 95 percent confidence level.

D.   RESULTS OF CHANGES TO ORB AMOUNT

BTE or the bonus to earnings ratio was shown to be statistically significant and had the second strongest impact on take decision, second only to marital status. Section 1 shows estimated take probability when the ORB is increased to keep pace with inflation through 2021. Section 2 shows the estimated take decision probability when the ORB is increased to the maximum bonus amount permitted by DOD Instruction 1304.34 (Office of the Under Secretary of Defense [USECDEF] 2016), and section 3 shows the results if no changes to the ORB are implemented and inflation continues to erode the bonus amount to the end of 2022.

1.   Simulated Effect of ORB Amount if Increased to Keep Pace with Inflation

Using the logistic regression results and mean values for each variable as outlined in Table 8, the BTE ratio was adjusted to keep the same purchasing power in 2021 as $80,000 had in 2015 when it was implemented. This reinflation resulted in a new ORB amount of $93,464 and an inflation adjusted BTE ratio of .761. The new BTE resulted in an estimated "TAKE" probability of 76.9 percent. Table 9 is a summary of the net result of this adjustment.

Table 9.   Analysis of ORB Increased to Keep Pace with Inflation through 2021

Baseline Take rate without increase in ORB	52.3%
New take rate with ORB increased to keep pace with inflation (2021)	76.9%
Net **increase** in NEOD officer inventory	24.6% *6 officers per YG

*Assumes 26 eligible officers per YG

2. Simulated Effect of Maximizing ORB Amount

Using the same average values and logistic regression results from Table 8, the ORB amount was increased to the maximum amount permitted $25k/year ($100,000 total) without an exception to policy waiver (USECDEF, 2016). This increase resulted in an overall BTE ratio of .951 and a predicted take rate of 97.3 percent. Table 10 summarizes the net result of this adjustment.

Table 10.   Analysis of Increasing the ORB to Maximum Amount Permitted

Baseline Take rate without increase in ORB	52.3%
New take rate with ORB increased to keep pace with inflation (2021)	97.3%
Net **increase** in NEOD officer inventory	45.0% *11 officers per YG

*Assumes 26 eligible officers per YG

3. Simulated Effect of Maintaining the Status Quo in 2022

This section explores the impact on predicted take rates in 2022 if no action is taken and the average inflation rate in the first quarter (7.9%), as defined by the BLS, remains constant on an annualized basis throughout 2022. This adjustment results in a "real" ORB amount of $64,820 and new BTE of .616. Table 11 summarizes the net result of maintaining the status quo.

Table 11.   Analysis of Maintaining the Status Quo in 2022

Baseline Take rate without increase in ORB	52.3%
New take rate with ORB decreased due to 2022 inflation (7.9%)	35.6%
Net **decrease** in NEOD officer inventory	-16.7% *5 officers per YG

*Assumes 26 eligible officers per YG

E.   COST-BENEFIT ANALYSIS

As discussed above, increasing the bonus amount to the maximum amount allowed results in a new ORB amount of $100,000 ($25k/yr). Assuming 26 officers continue to be eligible each year and 97.3 percent or 25 officers (as predicted by the model) elect to "take" the bonus, this change would translate to an overall increase in total cost to the Navy of $20,000 per officer or approximately $500,000 per year. As outlined in the introduction, the cost to initially train a single EOD officer is approximately $255,970 and the Navy's total investment from initial training to eligibility for the ORB is in excess of $2 million per officer. This analysis shows that purely from a cost perspective, an increase in the ORB is preferred to increasing officer accessions. Additionally, in 2020, it was further estimated that absent the ORB, the Navy would have to spend approximately $5.76M in additional accession and training costs per year to make up for the increase in NEOD officer attrition (ASN M&RA, 2020). Given the substantial investment and training time put into each officer, it is clear that a $20,000 increase in bonus amount is preferred when faced with the substantial cost of accessing and training additional officers into the pipeline.

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V. CONCLUSION AND RECOMMENDATIONS

A. CONCLUSION

This project developed a "take" estimation model for Navy EOD officers at 7 YCS. Using the survey data collected on prior NEOD officers, and the demographic data of bonus eligible NEOD officers, the effects of the ORB on take decisions was examined. Based on the statistical significance of the variables used in the logit regression model, this method is shown to be a reasonable approach for predicting the take decisions of NEOD officers. Additionally, financial incentives, specifically the ORB bonus amount, has a significant impact on one's "take" decision. The EOD Warfare ORB can continue to be a "low-cost, low-risk, high return-on-investment incentive… to mitigate the loss of officers, better maintain inventory…at a minimal expense to the Navy" (ASN M&RA, 2020, p. 5), however, it needs to be periodically updated to reflect changes in economic conditions.

B. RECOMMENDATIONS

1. Bonus Changes

With rapidly increasing inflation and private sector wage growth that is outpacing annual DOD adjustment it is likely that decreasing take rates will continue and may even accelerate. Therefore, if the ORB is going to continue to provide a healthy inventory of NEOD officers, it is recommended that, at a minimum, the ORB be updated periodically to keep pace with inflation and remain competitive with earnings potential outside the Navy. This finding is echoed in Snodgrass's research as he points out that:

> We are competing with a global demand for personnel to retain our best, brightest, and most talented officers—the same pool of officers who will one day rise to senior leadership. We cannot directly hire into positions of importance and therefore cannot afford simply to let them walk away. (Snodgrass, 2014, pp. 26–27)

Given the data and regression results, increasing the ORB bonus amount is shown to be a cost-effective way to increase take rates and thus retention of Navy EOD officers and keep them from walking away at critical career points.

2. Further Research

Suggested further research:

(1) As this project examined only ORB eligible officers at 7 YCS it is recommended the scope be expanded to include the ORB offered at 8 YCS as well as the ORB offered to LCDRs at 11/12 YCS. Furthermore, this project did not consider the payment structure of the bonus (installments vs. lump sum), which may be another way to increase take rates. Finally, further data collection on macroeconomic trends, personal preferences, and expanding the number of YGs would likely prove beneficial in increasing the accuracy of the model.

(2) Development of a more robust way to capture post-service earnings potential for Navy EOD officers. As seen in the survey results, NEOD officers possess many traits that are highly sought after outside of the Navy including; a tendency to have a technical educational background, extensive leadership and management experience, and are compensated with above average salaries as a result. A more robust way to capture post-service earnings would likely increase the accuracy of the BTE ratio, thus improving the utility of the logit model and its ability to accurately predict take decisions.

(3) Survey results for this study echoed Gutierrez's survey findings in that monetary reasons for resigning were one of the least prevalent answers. Instead, the vast majority of survey participants identified areas for improvement such as the detailing process, the overall limited EOD officer career path, and limited operational time. If retaining NEOD officers continues to be a top priority, it is recommended that these non-monetary issues be studied, which according to the surveyed participants, significantly impact retention.

APPENDIX A. SURVEY

Prior Navy EOD Officer Survey

Q1 How long did you serve as an active-duty Navy EOD Officer?

_____

Q2 When did you leave the Navy EOD Community?

_____

Q3 How many jobs have you had since leaving active service in the Navy?

_____

Q4 You had a concrete plan for your next career when you decided to resign from active service in the Navy.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q5 Was your plan the same 2 years after resigning? What changed?

_____

Q6 What was your highest level of education achieved when you _joined_ the Navy?

◯ Associate's degree (1)

◯ Bachelor's degree (2)

◯ Master's degree (3)

◯ Professional degree (4)

◯ Doctoral degree (5)

◯ Other (6) _____

Q7 What was your highest level of education achieved when you _left_ the Navy?

◯ Associate's degree (1)

◯ Bachelor's degree (2)

◯ Master's degree (3)

◯ Professional degree (4)

◯ Doctoral degree (5)

◯ Other (6) _____

Q8 What was your major/ field of study?

_____

Q9 What sector/field did you work in immediately after you left the Navy? What sector/field do you work in now?

_____

Q10 What was your first job title after leaving the Navy?

What is your current job title?

_____

Q11 The degree you pursued before/after the military was more important than your military experience to your current career.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q12 Your military training and experience created opportunities for your current career.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q13 Which post-military programs, degrees, or education opportunities best prepared you for your career?

_____

_____

Q14 What military experience was most marketable?

_____

_____

End of Block: EDUCATION

Start of Block: FINANCIAL

Q15 I considered the Navy EOD Officer Retention Bonus (ORB) when making my decision to leave the Navy.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q16 What was your starting annual salary at your first post-Navy job?

_____

Q17 Did you receive a signing bonus? If so, what was the amount?

_____

Q18 What is your current annual salary?

_____

Q19 Your military pay and benefits were superior to your *starting* civilian pay and benefits.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q20 Your military pay and benefits were superior to your *current* civilian pay and benefits.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q21 Your military health/dental care and insurance were superior to your civilian equivalent.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q22 Strictly from a financial perspective, you sometimes regret leaving the Navy.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q23 You chose a position confident your pay and benefits would increase.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q24 You still have a strong sense of belonging with the Navy EOD Community.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q25 You have a stronger sense of belonging with your current organization than what you experienced with the Navy EOD Community.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q26 Your input was valued more by your military superiors than your current civilian supervisors.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q27 Your potential for advancement was a driving factor in your decision to resign from the Navy.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q28 You have greater schedule flexibility as a civilian as compared to your active service in Navy EOD.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q29 Work-life balance is better as a civilian.

○ Strongly disagree (1)

○ Somewhat disagree (2)

○ Neither agree nor disagree (3)

○ Somewhat agree (4)

○ Strongly agree (5)

Q30 What were your main reasons for resigning from active service? Are they still valid?

_____

_____

_____

Q31 What do you miss most about your AD military service?

_____

_____

_____

Q32 In hindsight, what would have kept you in to serve as a Commanding Officer?

_____

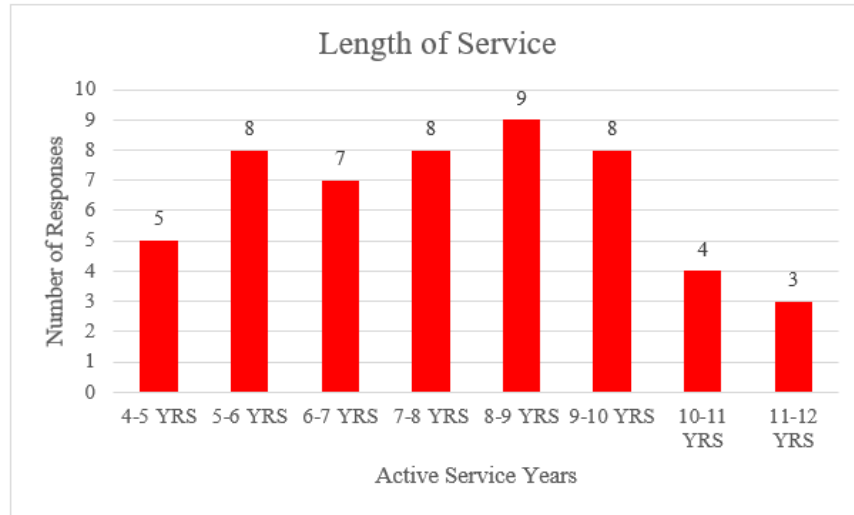_____

_____

End of Block: COMMUNITY/ WORK-LIFE BALANCE
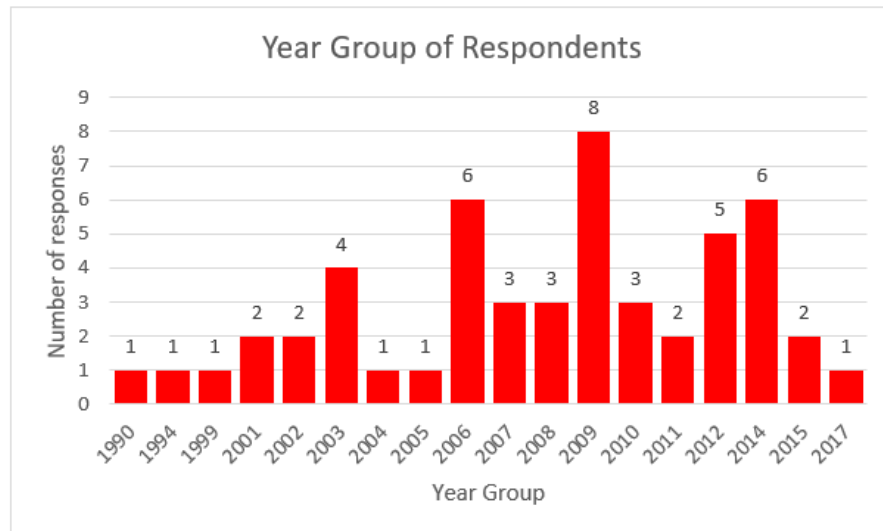
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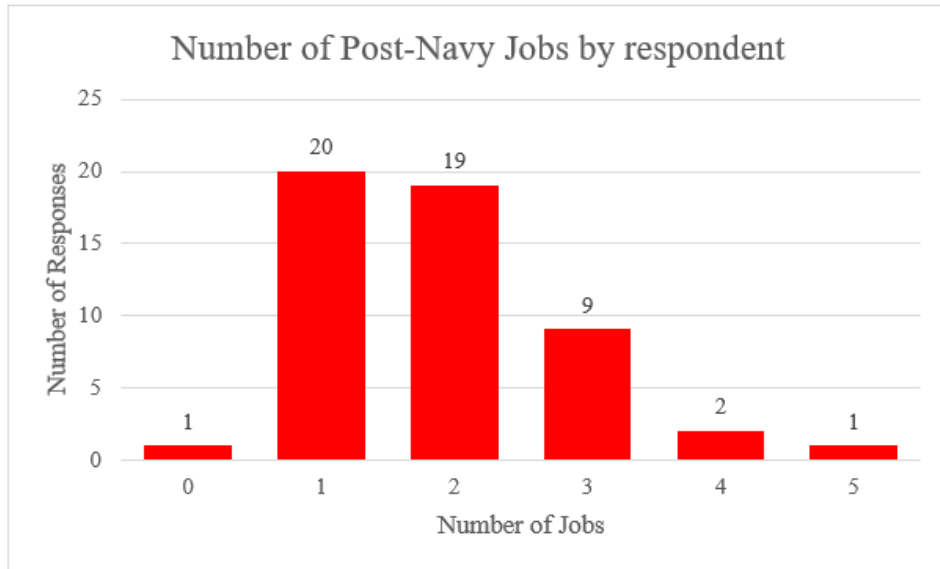# APPENDIX B. AGGREGATED SURVEY RESPONSES

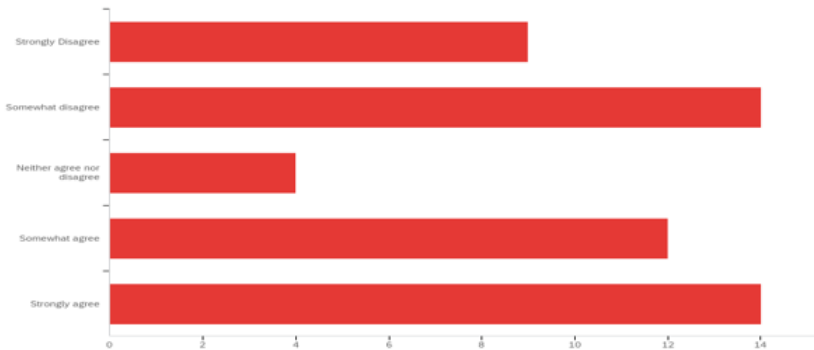**Q1 – How long did you serve as an active-duty Navy EOD Officer?**

Q2 – When did you leave the Navy EOD Community?

Q3 – How many jobs have you had since leaving active service in the Navy?

Number of Post-Navy Jobs by respondent

Q4 - You had a concrete plan for your next career when you decided to resign from active service in the Navy.

#	Answer	%	Count
1	Strongly Disagree	16.98%	9
2	Somewhat disagree	26.42%	14
3	Neither agree nor disagree	7.55%	4
4	Somewhat agree	22.64%	12
5	Strongly agree	26.42%	14
	Total	100%	53

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Q5 – Was your plan the same 2 years after resigning? What changed?

Resignation Plan Responses

What Changed? Responses
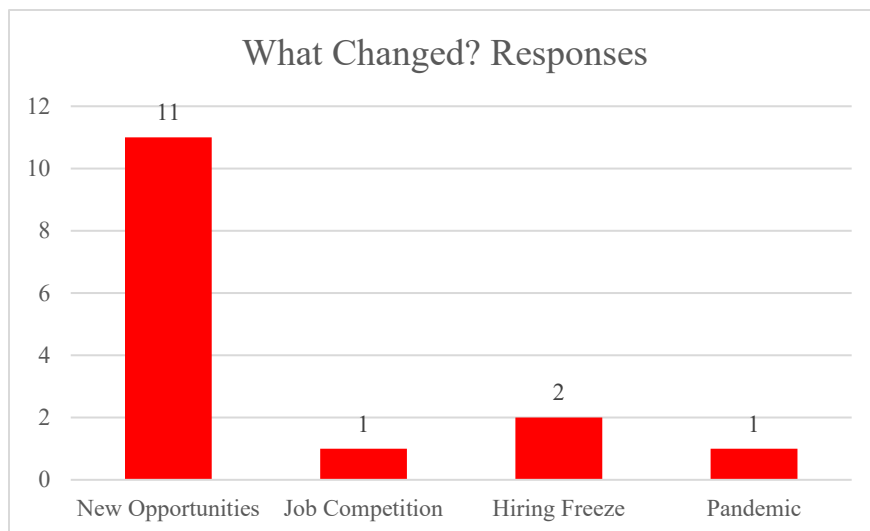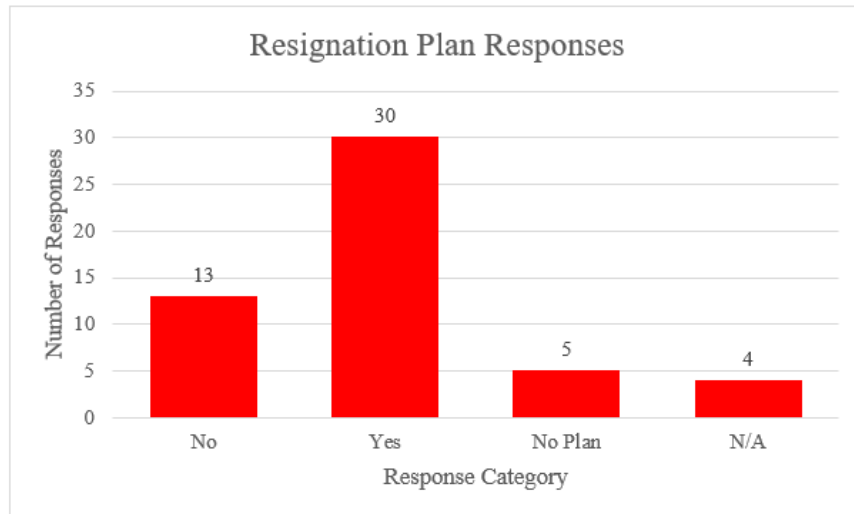
Q6 - What was your highest level of education achieved when you joined the Navy?
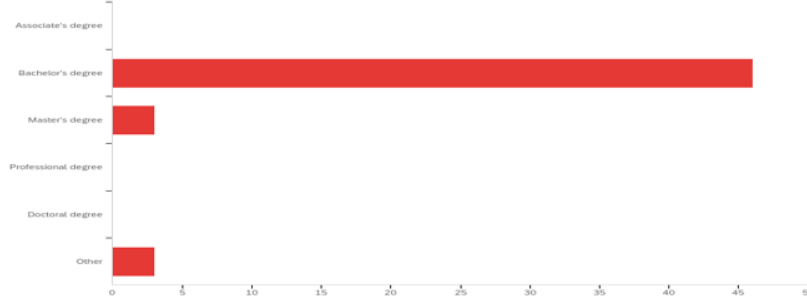
#	Answer	%	Count
1	Associate's degree	0.00%	0
2	Bachelor's degree	88.46%	46
3	Master's degree	5.77%	3
4	Professional degree	0.00%	0
5	Doctoral degree	0.00%	0
6	Other	5.77%	3
	Total	100%	52

Q7 - What was your highest level of education achieved when you left the Navy?
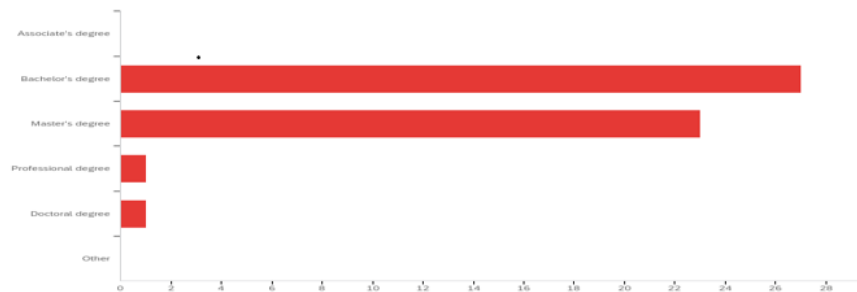
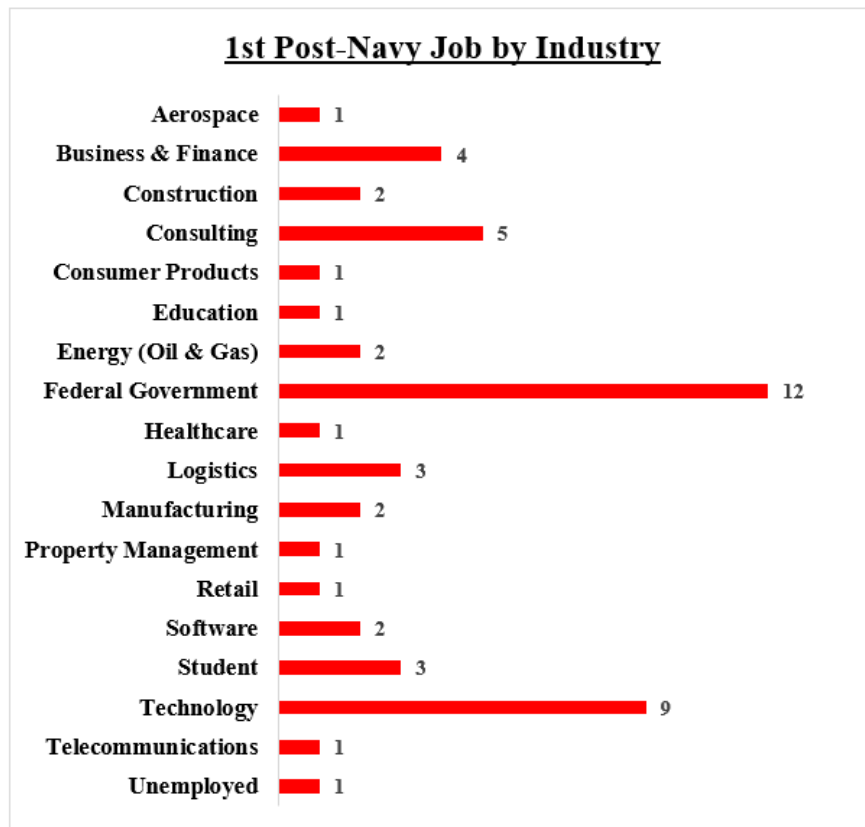| #	Answer	%	Count
1	Associate's degree	0.00%	0
2	Bachelor's degree	51.92%	27
3	Master's degree	44.23%	23
4	Professional degree	1.92%	1
5	Doctoral degree	1.92%	1
6	Other	0.00%	0
	Total	100%	52

Q8 – What was your major/ field of study?

Bachelor's Degree by Discipline
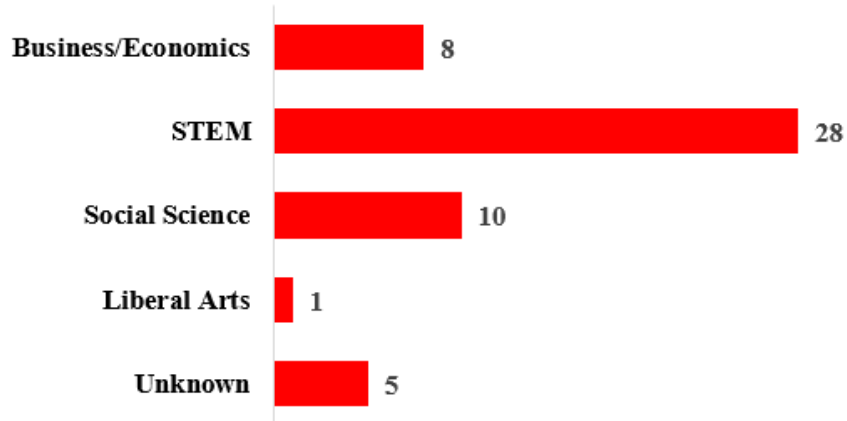
Discipline	Count
Business/Economics	8
STEM	28
Social Science	10
Liberal Arts	1
Unknown	5

Q9 – What sector/field did you work in immediately after you left the Navy?

1st Post-Navy Job by Industry

Industry	Count
Aerospace	1
Business & Finance	4
Construction	2
Consulting	5
Consumer Products	1
Education	1
Energy (Oil & Gas)	2
Federal Government	12
Healthcare	1
Logistics	3
Manufacturing	2
Property Management	1
Retail	1
Software	2
Student	3
Technology	9
Telecommunications	1
Unemployed	1

Q10 – What was your first job title after leaving the Navy?

Job Titles

Current Job Title
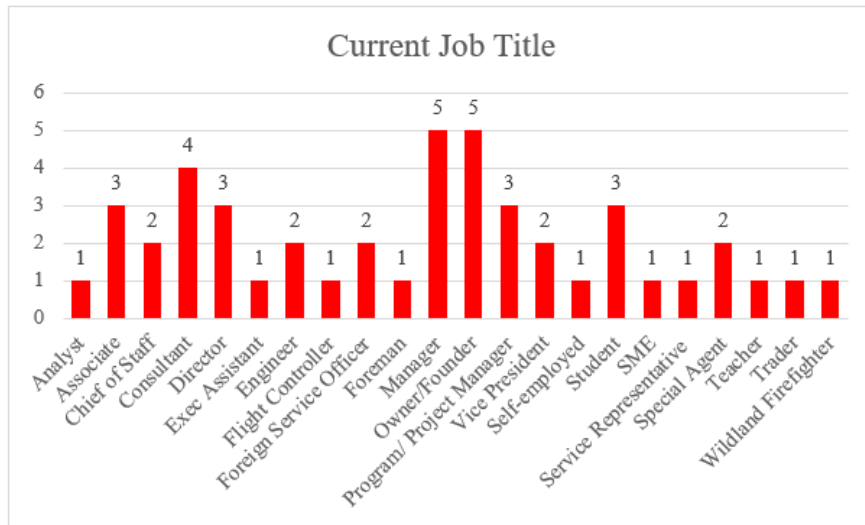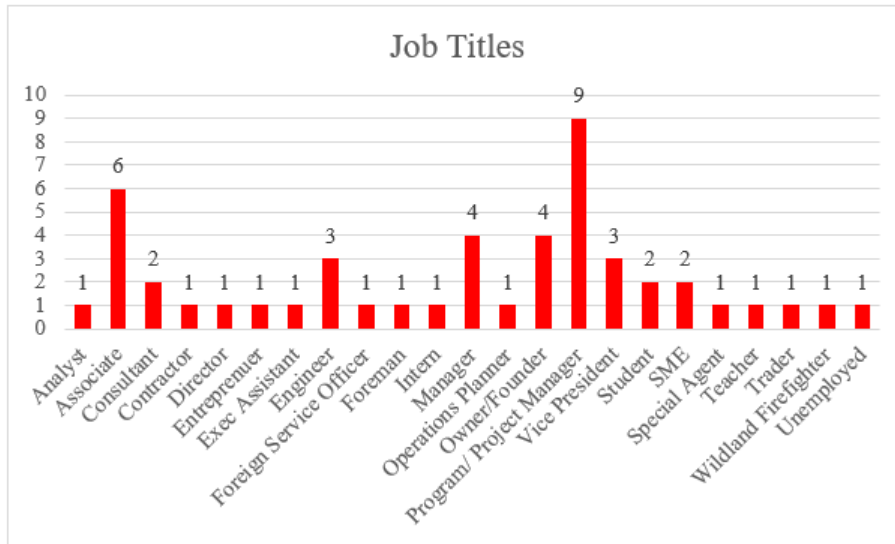
Q11 - The degree you pursued before/after the military was more important than your military experience to your current career.
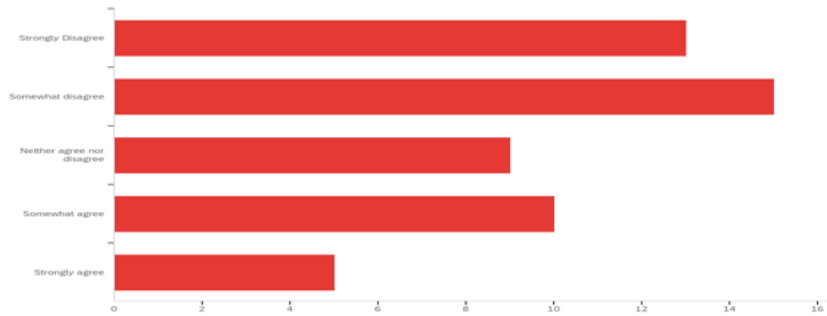
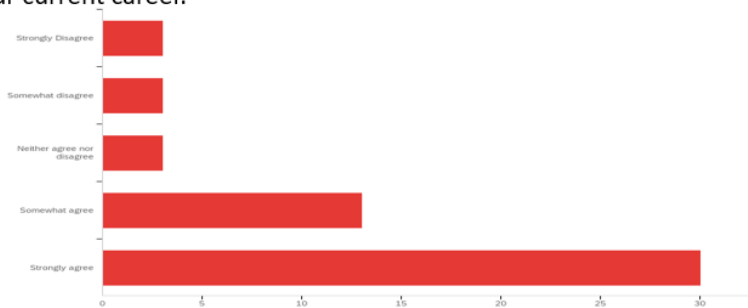| #	Answer	%	Count
1	Strongly Disagree	25.00%	13
2	Somewhat disagree	28.85%	15
3	Neither agree nor disagree	17.31%	9
4	Somewhat agree	19.23%	10
5	Strongly agree	9.62%	5
	Total	100%	52

Q12 - Your military training and experience created opportunities for your current career.

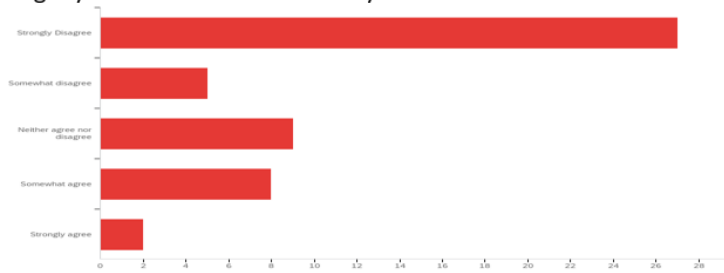| #	Answer	%	Count
1	Strongly Disagree	5.77%	3
2	Somewhat disagree	5.77%	3
3	Neither agree nor disagree	5.77%	3
4	Somewhat agree	25.00%	13
5	Strongly agree	57.69%	30
	Total	100%	52

Q13 – Which post-military programs, degrees, or education opportunities best prepared you for your career?

Post-Military Programs/ Degrees Most Useful

Category	Value
American Corporate Partners	1
Patrior Boot Camp	1
Codeacademy	1
Mentorship Programs	2
Vet Tec Program	1
Internships	1
Credentials	2
GI Bill	2
Transition Assistance (Breakline)	1
Advanced Degree (MBA)	8
Advanced Degree	7
N/A	24

Q14 – What military experience was most marketable?

Military Experience Most Markeable

| Category	Value
None	3
Unmanned Systems Experience	1
High Stress Performance	3
Critical Thinking	1
Conflict Resolution	1
Networking	1
Foreign Language/Cultural exposure	4
Problem Solving Experience	3
Communication	6
Management	17
Leadership	33

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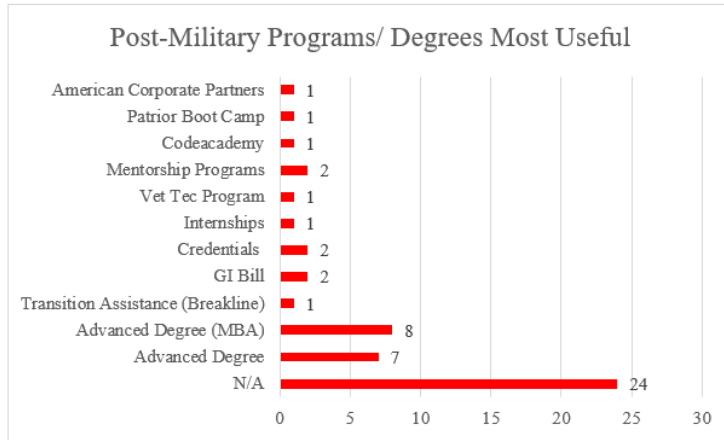
Q15 - I considered the Navy EOD Officer Retention Bonus (ORB) when making my decision to leave the Navy.

#	Answer	%	Count
1	Strongly Disagree	52.94%	27
2	Somewhat disagree	9.80%	5
3	Neither agree nor disagree	17.65%	9
4	Somewhat agree	15.69%	8
5	Strongly agree	3.92%	2
	Total	100%	51

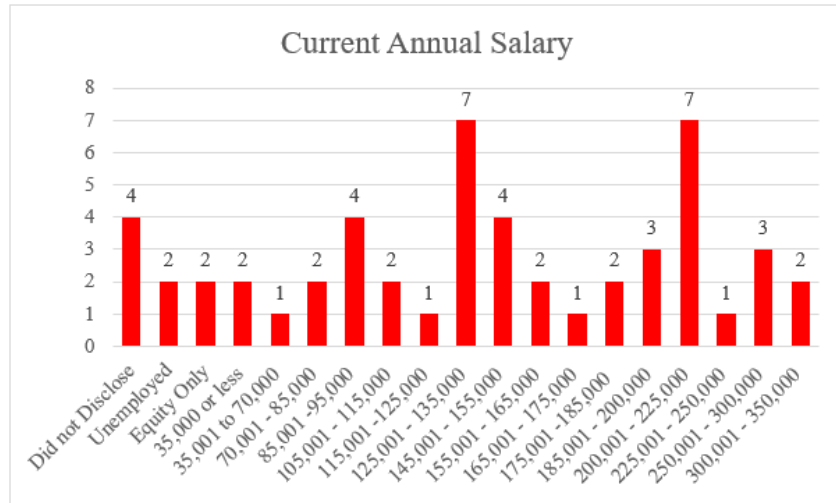## Q16 – What was your starting annual salary at your first post-Navy job?
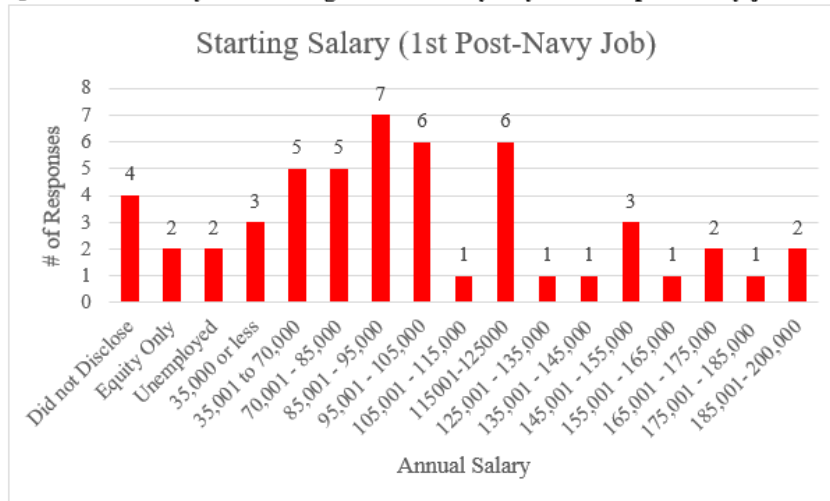
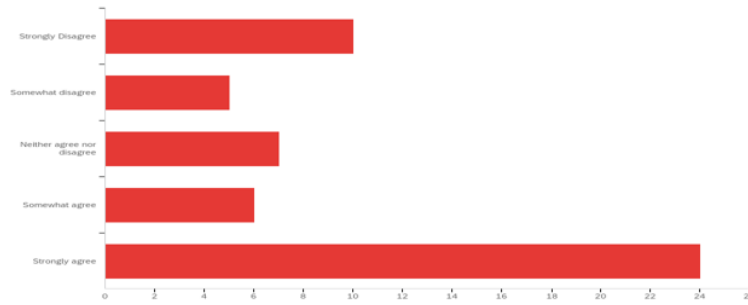**Q17 – Did you receive a signing bonus? If so what was the amount?**


Signing Bonus Summary

Q18 – What is your current annual salary?
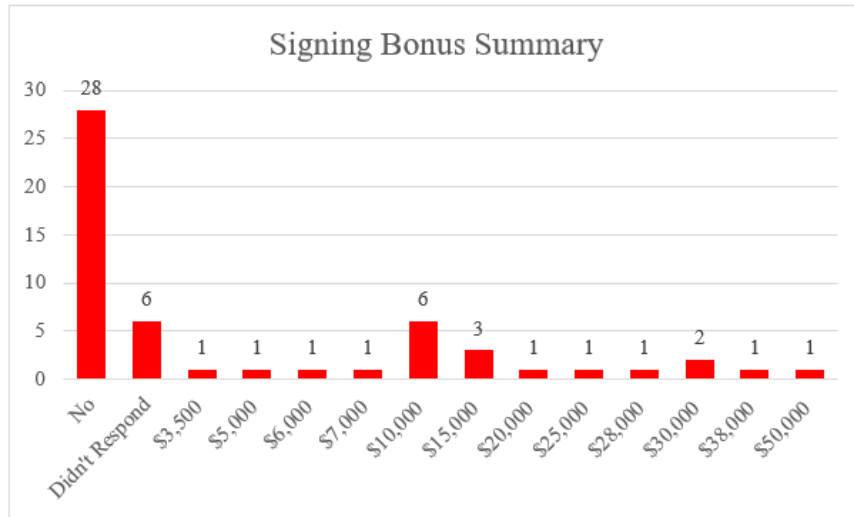
Current Annual Salary

Q19 - Your military pay and benefits were superior to your starting civilian pay and benefits.

#	Answer	%	Count
1	Strongly Disagree	19.23%	10
2	Somewhat disagree	9.62%	5
3	Neither agree nor disagree	13.46%	7
4	Somewhat agree	11.54%	6
5	Strongly agree	46.15%	24
	Total	100%	52

Q20 - Your military pay and benefits were superior to your current civilian pay and benefits.
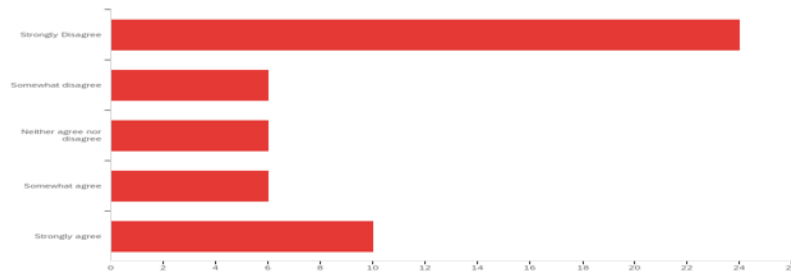
#	Answer	%	Count
1	Strongly Disagree	46.15%	24
2	Somewhat disagree	11.54%	6
3	Neither agree nor disagree	11.54%	6
4	Somewhat agree	11.54%	6
5	Strongly agree	19.23%	10
	Total	100%	52

Q21 - Your military health/dental care and insurance were superior to your civilian equivalent.
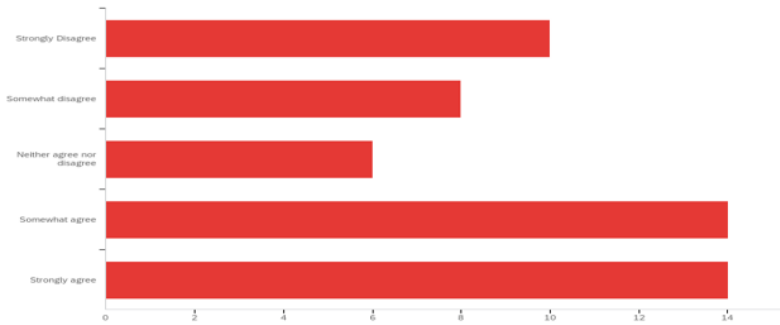
#	Answer	%	Count
1	Strongly Disagree	19.23%	10
2	Somewhat disagree	15.38%	8
3	Neither agree nor disagree	11.54%	6
4	Somewhat agree	26.92%	14
5	Strongly agree	26.92%	14
	Total	100%	52

Q22 - Strictly from a financial perspective, you sometimes regret leaving the Navy.
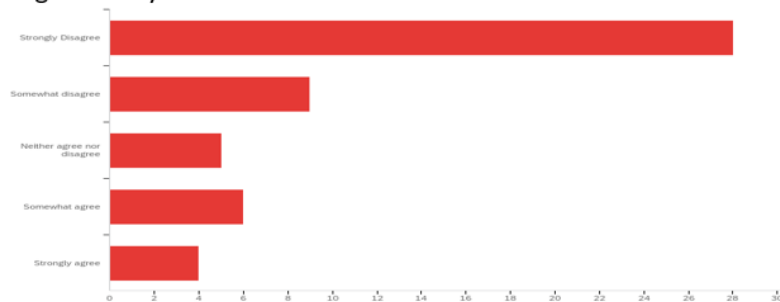
#	Answer	%	Count
1	Strongly Disagree	53.85%	28
2	Somewhat disagree	17.31%	9
3	Neither agree nor disagree	9.62%	5
4	Somewhat agree	11.54%	6
5	Strongly agree	7.69%	4
	Total	100%	52

Q23 - You chose a position confident your pay and benefits would increase.
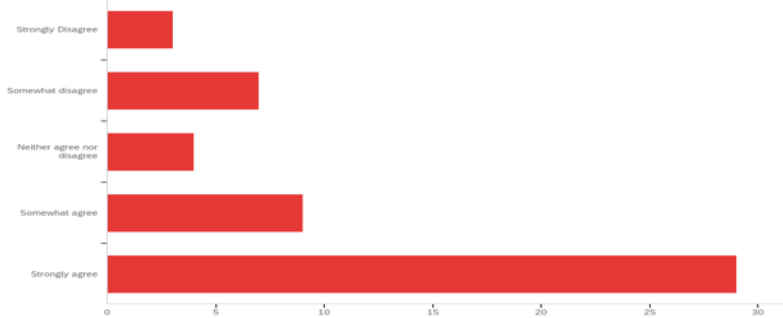
#	Answer	%	Count
1	Strongly Disagree	5.77%	3
2	Somewhat disagree	13.46%	7
3	Neither agree nor disagree	7.69%	4
4	Somewhat agree	17.31%	9
5	Strongly agree	55.77%	29
	Total	100%	52

Q24 - You still have a strong sense of belonging with the Navy EOD Community.
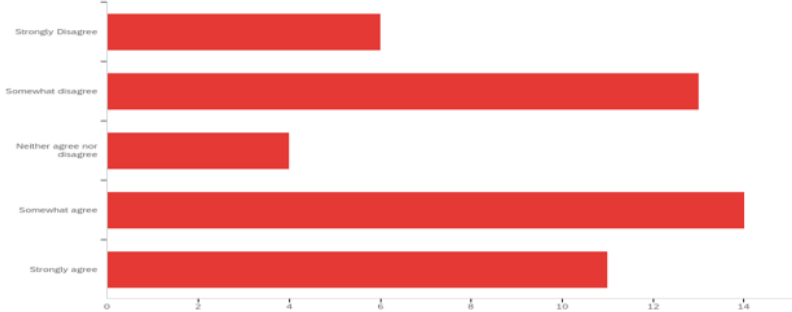
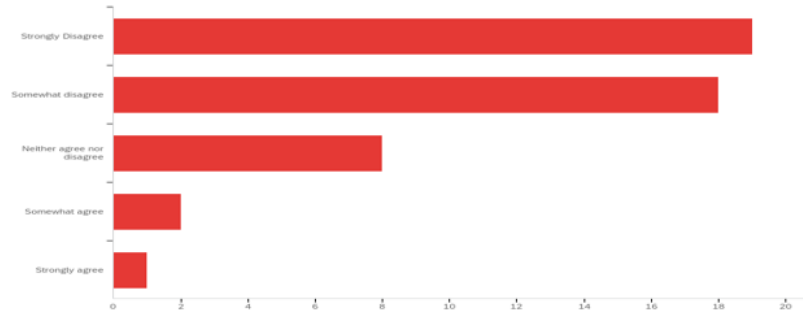| #	Answer	%	Count
1	Strongly Disagree	12.50%	6
2	Somewhat disagree	27.08%	13
3	Neither agree nor disagree	8.33%	4
4	Somewhat agree	29.17%	14
5	Strongly agree	22.92%	11
	Total	100%	48

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Q25 - You have a stronger sense of belonging with your current organization than what you experienced with the Navy EOD Community.
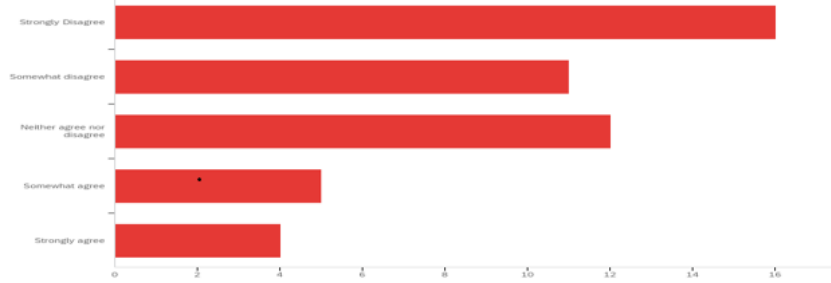
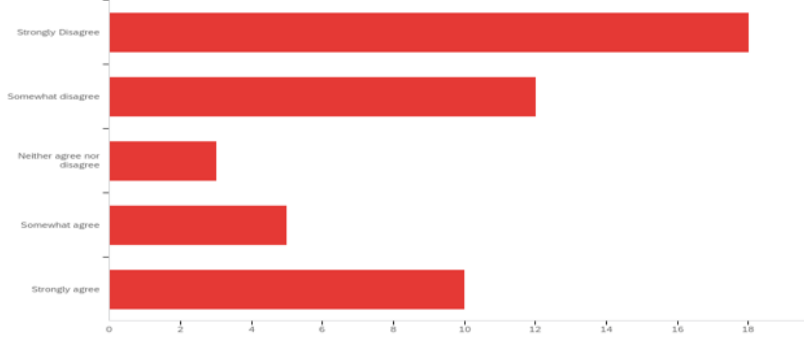| #	Answer	%	Count
1	Strongly Disagree	33.33%	16
2	Somewhat disagree	22.92%	11
3	Neither agree nor disagree	25.00%	12
4	Somewhat agree	10.42%	5
5	Strongly agree	8.33%	4
	Total	100%	48

Q26 - Your input was valued more by your military superiors than your current civilian supervisors.

#	Answer	%	Count
1	Strongly Disagree	39.58%	19
2	Somewhat disagree	37.50%	18
3	Neither agree nor disagree	16.67%	8
4	Somewhat agree	4.17%	2
5	Strongly agree	2.08%	1
	Total	100%	48

Q27 - Your potential for advancement was a driving factor in your decision to resign from the Navy.

#	Answer	%	Count
1	Strongly Disagree	37.50%	18
2	Somewhat disagree	25.00%	12
3	Neither agree nor disagree	6.25%	3
4	Somewhat agree	10.42%	5
5	Strongly agree	20.83%	10
	Total	100%	48

Q28 - You have greater schedule flexibility as a civilian as compared to your active service in Navy EOD.
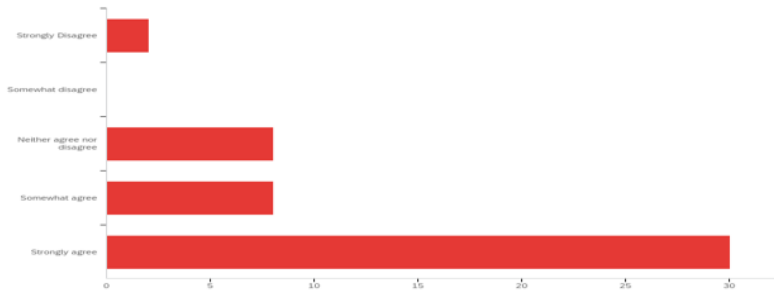
#	Answer	%	Count
1	Strongly Disagree	4.17%	2
2	Somewhat disagree	0.00%	0
3	Neither agree nor disagree	16.67%	8
4	Somewhat agree	16.67%	8
5	Strongly agree	62.50%	30
	Total	100%	48

Q29 - Work-life balance is better as a civilian.
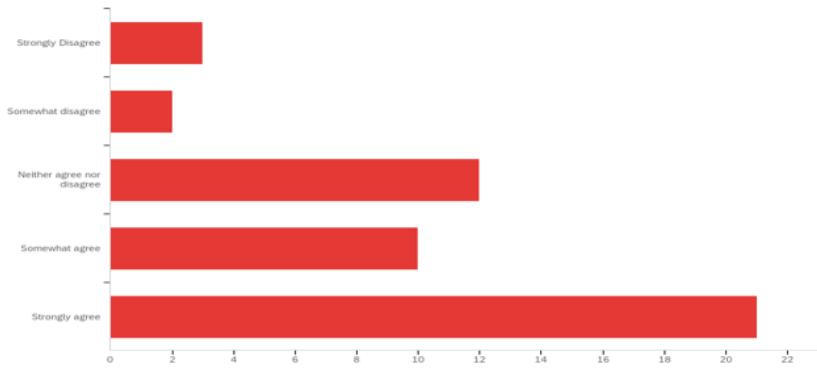
#	Answer	%	Count
1	Strongly Disagree	6.25%	3
2	Somewhat disagree	4.17%	2
3	Neither agree nor disagree	25.00%	12
4	Somewhat agree	20.83%	10
5	Strongly agree	43.75%	21
	Total	100%	48

Q30 – What were your main reasons for resigning from active service?

Reason for Resigning

Q31 – What do you miss most about your AD military service?

"Miss most" Responses

Category	Value
Sense of Purpose	11
Physical training	2
Pay	2
Nothing	2
No response	5
Mission	5
Camraderie	42
Adventure	7

Q32 – In hindsight, what would have kept you in to serve as a Commanding Officer?

What would have kept you in?

Category	Value
Nothing	9
No response	8
Better Detailing	9
Culture Change	5
Community Direction	2
Broader Career Opportunities (e.g., Acq)	5
Operational Command/Leadership Opportunities	9
Better Mentorship	3
Better Community Leadership	4
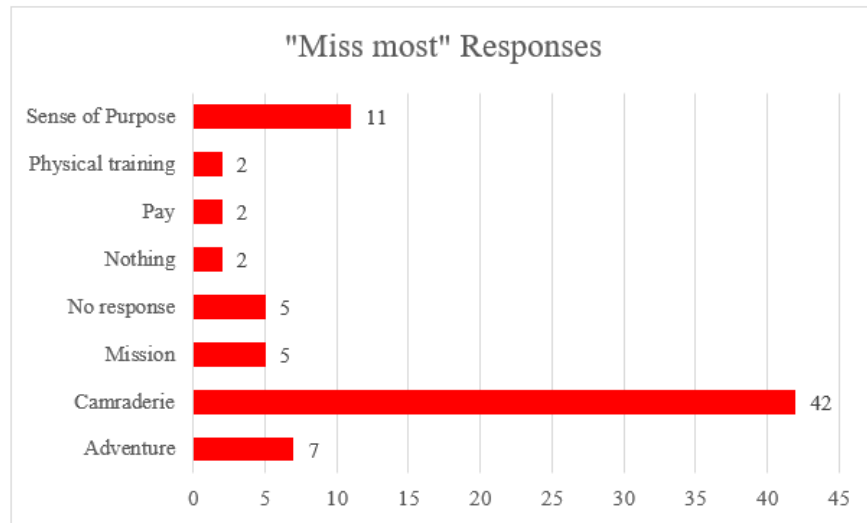
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APPENDIX C. REGRESSION RESULTS

Logistic Regression

	# Iter	20		Alpha	0.05			**LL statistics**			**Classification Table**		
	coeff	*s.e.*	*Wald*	*p-value*	*exp(b)*	*lower*	*upper*	LL	-120.4908044			Obs Suc	Obs Fail	Total
intercept	-6.236341778	5.848141938	1.137166369	0.286251885	0.001957			LL0	-138.3394919		Pred Suc	115	45	160
BTE	12.46665517	5.865126331	4.51798882	0.033540237	259537.159	2.64116153	2.55E+10	Chi-sq	35.69737506		Pred Fail	21	31	52
MARITAL STATUS	0.915396822	0.374407261	5.977647149	0.014488318	2.49776622	1.19910096	5.202928	df	9		**Total**	**136**	**76**	**212**
Children	0.820935905	0.406264871	4.083193482	0.043311727	2.2726258	1.02497825	5.038964	p-value	4.48598E-05		Accuracy	0.84559	0.40789	0.68868
CS 1(USNA)	0.369964171	1.075963815	0.118228996	0.73096328	1.44768274	0.17571601	11.92712	R-sq (L)	0.129020913					
CS 2(ROTC)	0.519491387	1.09262135	0.226056677	0.634463285	1.68117237	0.19750189	14.31045	R-sq (CS	0.154970588		Cutoff	0.5		
CS 3(OCS)	2.918003036	1.619729377	3.245536974	0.071618219	18.5042981	0.77367127	442.5769	R-sq (N)	0.212622921					
CS 4(STA-21)	2.192141102	1.465072426	2.238818159	0.13458381	8.95436481	0.50694737	158.1637	AIC	260.9816088		AUC	0.73055		
AGE	-0.119625053	0.127609902	0.878770635	0.348538614	0.88725305	0.6909168	1.139382	BIC	294.5474715					
UNEMPLOYMENT	-1.368041686	12.52176	0.01193625	0.913001707	0.25460507	5.5889E-12	1.16E+10							

Covariance matrix

										Converge
34.20076413	-23.93415566	0.012396526	0.186305818	-1.464130961	-1.5532672	2.44930502	2.582398	-0.4784	-31.061	-3.36953E-14
-23.93415566	34.39970687	-0.128945314	0.33001217	-0.21227103	-0.1508423	0.49969874	-0.221675	-0.044	18.1389	-2.76446E-14
0.012396526	-0.128945314	0.140180797	-0.047708446	0.038524389	0.03854448	0.04148606	0.055611	-0.0014	-0.1151	-2.99205E-14
0.186305818	0.33001217	-0.047708446	0.165051145	-0.025083938	-0.0202522	0.0455367	0.041067	-0.0135	-0.0725	-1.32117E-14
-1.464130961	-0.21227103	0.038524389	-0.025083938	1.15769813	1.11311755	0.97169934	0.988625	0.01593	0.23061	-2.12608E-14
-1.553267223	-0.150842303	0.038544476	-0.020252249	1.113117552	1.19382141	0.960121	0.977103	0.01728	0.29035	-8.10463E-15
2.449305022	0.49969874	0.041486056	0.045536696	0.971699337	0.960121	2.62352325	1.949543	-0.1224	-3.9571	-2.22045E-15
2.582397802	-0.221674721	0.055611381	0.041067018	0.988625482	0.97710268	1.94954317	2.146437	-0.1124	-2.7718	-2.66454E-15
-0.478374404	-0.043956161	-0.001413301	-0.01345032	0.015925163	0.01727688	-0.1223839	-0.112439	0.01628	0.33384	-1.07114E-12
-31.06108959	18.13894471	-0.115062112	-0.072519806	0.230605745	0.29035063	-3.9570633	-2.771789	0.33384	156.794	-1.72085E-15

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