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United States Marine Corps: The Confluence of Leadership, the Blended Retirement System, and the Thrift Savings Plan

March 2024

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Prepared for the Naval Postgraduate School, Monterey, CA 93943.

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ABSTRACT

The Department of Defense's transition to the Blended Retirement System (BRS) in 2018 marked a significant shift in military retirement planning, allowing service members for the first time to receive matching contributions to their Thrift Savings Plan (TSP). This thesis delves into the financial implications of default settings within the BRS, focusing on outcomes for three distinct groups: opt-in members, automatic 3% enrollees, and automatic 5% enrollees. Developing a conceptual framework to construct various financial models, this thesis examines the differences in TSP portfolio earnings based on default settings and assesses the appropriateness of Roth and traditional TSP account options for enlisted personnel and officers. This thesis illustrates differences in service member contributions, government matching contributions, TSP portfolio balances at the end of different service lengths, and the projected TSP account balances at age 60 given an annual 8% rate of return. Current data shows that not all BRS members are actively contributing to the TSP or receiving the full government match. This highlights a missed opportunity for current active-duty service members. Moreover, the complexity of TSP account selection is underscored, emphasizing the importance of informed decision-making. Leadership intervention and enhanced financial education are needed to correct these issues and raise awareness of retirement entitlements among all BRS participants.



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The *Inglorious Batters* boasted a perfect record of 18–0, were back-to-back league champions, with two signs hanging from the NPS softball field to prove it. This team was custom built around Marines. No better friend, no better Batters! We enjoyed wins on the softball field and took our talent to the local golf courses for continued sport and enjoyment.

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LIST OF ACRONYMS AND ABBREVIATIONS

BRS	Blended Retirement System
CBO	Congressional Budget Office
CFS	Command Financial Specialist
CRS	Congressional Research Service
CSB	Career Status Bonus
CY	Calendar Year
DOD	Department of Defense
EAS	End of Active Service
FRTIB	Federal Retirement Thrift Investment Board
FV	Future Value
FY	Fiscal Year
IG	Inspector General
IRA	Individual Retirement Account
IRS	Internal Revenue System
MOL	Marine Online
MRF	Military Retirement Fund
MSCI EAFE	Morgan Stanley Capital International and Europe, Australasia, and Far East
NDAA	National Defense Authorization Act
PFMP	Personal Financial Management Program
PV	Present Value
S&P 500	Standard and Poor's 500
TSP	Thrift Savings Plan
USBRS	Uniformed Services Blended Retirement System
USMC	United States Marine Corps



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I. INTRODUCTION

In 2018 the Department of Defense (DOD) switched to the Blended Retirement System (BRS). Unlike previous military retirement plans, the BRS offered a defined contribution plan under the Thrift Savings Plan (TSP). The motivation behind this change included delivering some type of retirement benefit for service members who did not complete 20 years of service to obtain an annuity (Murray & Adedeji, 2020). With most personnel leaving after one or two terms of service, this defined contribution could viably grow to help with their retirement needs. Specifics of the government match include a 1% monthly base pay match from 60 days to 24 months of service. Then, after two years the account is vested and the government match can increase up to a 5% monthly base pay match if the service member contributes at least 5% (Uniformed Services Blended Retirement System [USBRS], 2017).

This thesis brings awareness to BRS policy change for defined contributions as directed by the Federal Retirement Thrift Investment Board (FRTIB), which is the governing board of the TSP. Current senior levels of leadership, both officer and enlisted, are most commonly legacy retirement members. They may not understand the intricacies of the BRS. Additionally, BRS service members may also not be adequately knowledgeable about the specifics of their own retirement program. By better understanding the specifics of the BRS, and its recent changes, leadership can help guide those they lead to make informed financial decisions.

While this information applies across the DOD, I focus on providing the Marine Corps with short-term recommendations that are actionable now at the unit level and long-term recommendations that can be implemented in the Marine Corps Personal Financial Management Program (PFMP). As a Marine Corps trained, Command Financial Specialist (CFS), I have helped educate Marines on the TSP and make informed decisions about their own portfolios. Marine Corps leadership prides itself on servant leadership. This is embodied in its doctrinal publication, titled “Leading Marines.” As part of their ethos, Marines are charged with intrusive leadership to best ensure those they lead are taken care of across many facets of life (United States Marine Corps [USMC], 2019). It is imperative



that leaders understand the implications of the BRS. Even as a CFS, I learned new things about the BRS while conducting this research. I offer this information to the reader, to stay updated and help motivate their Marines to care about their own financial health.

BRS members fall into one of the following three demographics:

1. BRS Opt-In Members
2. BRS Members (Automatic 3% Enrollment)
3. BRS Members (Automatic 5% Enrollment)

BRS Opt-In members were not automatically enrolled in the TSP; instead to participate in the TSP they needed to set up and adjust their own account. Meanwhile, BRS members who entered service between January 1, 2018 – September 30, 2020 were automatically enrolled in the TSP at 3% of their monthly base pay. Currently, BRS members from October 1, 2020 – present are automatically enrolled in the TSP at 5% of their monthly base pay. These automatic member contributions are defaulted into a traditional TSP account, unless the service member elects a Roth account, or switches his or her account at a later time.

As of September 2023, the FRTIB reported that only 84.9% of BRS service members were receiving their full match (Federal Retirement Thrift Investment Board [FRTIB], 2023). Based on changes to policy, during the implementation of BRS, it is most likely that participants not receiving their full match belong to the first two demographics. In this same report, the FRTIB stated that for the first time BRS service members outnumbered legacy retirement members.

The following research questions guide my study.

1. What are the differences in potential TSP earnings, for enlisted and officer Marines in their first four years of service, based on BRS default settings for BRS Opt-In Members, BRS Members (Automatic 3% Enrollment), and BRS Members (Automatic 5% Enrollment)?



2. What is the difference in potential earnings based on the type of TSP account, Roth versus traditional, for enlisted service members serving four years, eight years, or a 20 year-career?
3. What is the difference in potential earnings based on the type of TSP account, Roth versus traditional, for officers serving four years, seven years, or a 20 year-career?

For my methodology, I build a conceptual framework of financial models utilizing the future value equation to examine the differences in potential earnings and to address my research questions. I show the amount a service member contributes each year to their TSP under default settings, the amount the government matches under the same default settings, what the portfolio balance is at the end of active service (EAS), and what it grows to at an 8% annual interest rate until age 60. Using a sensitivity analysis, I explore which type of TSP account may be the highest value for a service member based on their own expected earnings at retirement age. By analyzing this data, leadership could help those they lead make better informed decisions on which type of TSP account is best suited for their retirement needs.

The remainder of my thesis is composed of four chapters. Chapter II consists of a detailed history of military retirement systems, current information about the TSP, and important updates to BRS defined contributions. In Chapter III, I examine existing literature on financial education and retirement savings, approaches to changes in military compensation and retirement, selecting a Roth versus a traditional retirement account, and the ethos of leading Marines. Chapter IV contains my conceptual financial model analysis, under certain assumptions, as it pertains to my research questions. Finally, in Chapter V, I summarize my findings and offer both short- and long-term recommendations that Marine Corps leadership can implement to assist with the financial health of the Marines they lead.



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II. UNDERSTANDING THE NEW MILITARY RETIREMENT SYSTEM

To best understand recent changes to the BRS, a brief historical review of military retirement systems provides context to understand what has changed. In this Chapter I explain motivation behind the BRS transition, discuss specifics on the TSP, and provide the most recent data from September 2023. Understanding this framework provides the essential background knowledge for the reader to understand the three different demographics formed after the implementation of the BRS and the critical elements in the conceptual model I developed in this study.

A. HISTORY OF MILITARY RETIREMENT PLANS

Pensions, or a defined benefit plan, date back to the founding of the United States during the American Revolutionary War; however, they were not widely adopted until the mid-20th century (Phipps, 2020). The United States Department of Labor defines a defined benefit plan as a retirement plan that promises a specified monthly benefit at retirement. This promise is protected by federal insurance provided through the Pension Benefit Guaranty Corporation (United States Department of Labor, n.d.). During the mid-20th century, it was commonplace for employers to have a defined benefit plan where all employees knew how much money they could expect in retirement, after completing a certain number of years of work.

Prior to the BRS, there were three military retirement plans known as: Final Pay, High-36, and REDUX. It is intriguing to see how these military retirement plans changed over time, each affecting their population of service members in a different manner. Figure 1 shows these three different retirement plans and includes an explanation of each plan's differences.



Name of Retirement Plan	Type of Retirement Plan
Final Pay	Defined Benefit that equals 2.5% times the number of years of service times the member's final basic pay on the day of retirement
High-36	Defined Benefit that equals 2.5% times the number of years of service times the average of the member's highest 36 months of basic pay
REDUX	Career Status Bonus \$30,000 lump sum payment at 15th year of service with obligation to serve through 20 years + defined benefit Defined Benefit is (a) Prior to age 62: 2.5% times the number of years of service minus 1.0% for each year of service less than 30, times the average of the member's highest 36 months of basic pay (b) At age 62 and after: 2.5% times the number of years of service times the average of the member's highest 36 months of basic pay

Figure 1. Military Compensation-Post WWII to 2017. Source: Department of Defense (n.d.b).

1. Final Pay (World War II–September 7, 1980)

Following World War II, 20 years of service became the baseline where military members could retire and receive a lifetime annuity. This first DOD retirement plan was known as Final Pay. Where upon reaching 20 years of service, a service member received a monthly annuity of 2.5% times their total years of service, calculated from their final basic pay on the day of retirement (Department of Defense [DOD], n.d.b). For each additional year of service past 20 years they add an additional 2.5 percentage points to their annuity. Compared to subsequent military retirement plans, this represented a premium defined benefit plan.

2. High-36 or Legacy System (September 8, 1980–December 31, 2017)

Congress altered the military retirement system in the National Defense Authorization Act (NDAA) of 1981 to a High-36 system. The High-36 retirement plan, also referred to as the legacy system, was the contemporary plan for service members in active service from 1980 – 2017. The difference was that instead of calculating the final basic pay on the day of retirement, the average basic pay over the last three years of service was calculated, or as the name suggests 36 months (National Defense Authorization Act



[NDAA], 1981). This change reduced the total amount paid to retirees' long term as part of the federal budget.

3. REDUX (August 1, 1986–December 31, 2002)

The Military Retirement Reform Act of 1986 put a premium on 30 years of service vice 20 years. This plan enticed military members to elect the Career Status Bonus (CSB) at 15 years of service, trading \$30,000 cash up front in exchange for a lesser annuity payout up to age 62 (Military Retirement Reform Act, 1986).

B. BLENDED RETIREMENT SYSTEM

The NDAA for Fiscal Year (FY) 2016 reformed the military retirement system for all service members entering active service after January 1, 2018 (NDAA, FY2016). Additionally, those service members who had been in service from December 31, 2005 – December 31, 2017, had the option to elect this new retirement plan. Those who elected the BRS are known as BRS Opt-In members.

The BRS is a blend of four things: defined benefits, defined contributions, continuation pay, and a lump sum option at retirement. In the three previous military retirement systems there were no defined contributions, continuation pay, or lump sum options. The United States Department of Labor defines a defined contribution plan as a retirement plan that doesn't promise a specific number of benefits at retirement. Instead, a combination of the employee and employer contribute to an individual retirement account for the individual (United States Department of Labor, n.d.). This retirement account for military members is the TSP.

The DOD enacted this change for a myriad of reasons to include delivering more retirement benefits to service members who did not reach military retirement age and to save in monetary disbursements for defined benefits long term. Data revealed that just 19% of active-duty personnel completed 20 years of service necessary to become eligible for a lifetime annuity (Philpott, 2019). Figure 2 shows the share of enlisted personnel, by service, who remain in the military by years of service, as tabulated by the Congressional Budget Office (CBO).



Examining this figure, you can see that most enlisted personnel exit service after one or two enlistments, which is generally four or eight years. For the Marine Corps, there is a huge drop-off between four years and six years of service. This represents the first opportunity enlisted Marines can exit service after successfully completing their obligated service. Only 25% of enlisted Marines serve past six years. Thus, looking at this data it is easy to see how defined contributions could affect a much greater population, inclusive of all service members, vice those who only make it to 20 years.

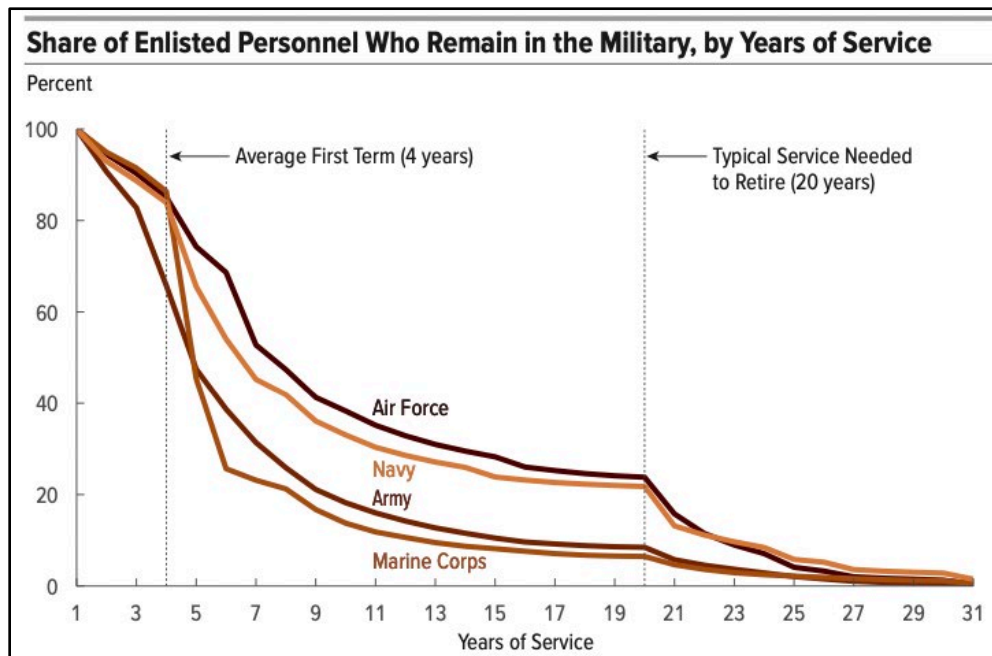


Figure 2. Enlisted Personnel Who Remain in the Military. Source: CBO (2020).

1. Defined Benefits

Under the BRS, service members who complete 20 years of service receive a monthly annuity of 2% times their total years of service, calculated from the average of their basic pay during their last three years of service. This is a 0.5 percentage point decrease, per year, from the legacy plan. For each additional year of service, past 20 years, they add an additional 2 percentage points. For example, 25 years of service constitutes a



50% defined benefit payout. A service member who retires at 25 years, under the legacy system, receives 62.5% of their monthly base pay.

2. Defined Contributions

A key aspect of the BRS is that it offers defined contributions up to 5% of basic pay, per month, for military members. The government automatically begins defined contributions at 1% from 2 months of service through 26 years. Following two years, the service member is vested in their account and at this juncture the government will match an additional amount, up to 5% through 26 years (USBRS, 2017). Defined contributions stop after 26 years of service, which is traditionally about the transition to flag rank for officers. Figure 3 shows the government defined contribution percentages based on the service members individual contribution percentage.

Service Contributions to Your Account			
You put in:	Your Service puts in:		And the total contribution is:
	Automatic (1%) Contribution	Service Matching Contribution	
0%	1%	0%	1%
1%	1%	1%	3%
2%	1%	2%	5%
3%	1%	3%	7%
4%	1%	3.5%	8.5%
5%	1%	4%	10%
More than 5%	1%	4%	Your contribution +5%

Figure 3. Government Defined Contribution Scale. Source: USBRS (2017).

Retirement savings accounts are divided into traditional and Roth accounts. The Internal Revenue System (IRS) defines a traditional account as a way to save for retirement that gives the individual tax advantages (Internal Revenue System [IRS], 2024). Meaning the contributions or earnings, and gains are not taxed. However, upon making withdrawals all monetary assets in this account are taxed based on the owner’s tax bracket. Meanwhile, in a Roth retirement account, you contribute after tax dollars and your money has the advantage of growing tax free (IRS, 2024).



All government matching defined contributions are placed into a traditional TSP account. Even if the service member is invested 100% in a Roth TSP account, the government matching defined contributions will always enter a traditional TSP account (Thrift Savings Plan [TSP], n.d.d). Thus, the government taxes defined contributions and earnings when the service member withdraws money from his or her account many years later.

It is important to note that the government matches each BRS service member up to 5% per month. This accounts for 12 investment periods per year. If the service member maxes out, or reaches his or her TSP contributions early, before the end of the year, then they lose out on matching government contributions. To always receive the full match, the member must be careful about how they set their own contribution percentage. The maximum contribution limit for the TSP in 2024 is \$23,000 (TSP, n.d.a).

3. Continuation Pay

Service members with between 8 – 12 years of service are eligible to receive continuation pay, a one-time mid-career bonus in exchange for extended service, at a payout of 2.5 – 13 times their regular pay. Rates are established annually by each individual service and may fluctuate based on specific billets, retention rates, and specialty skills (USBRS, 2022).

Figure 4 shows continuation pay rates for 2023. As of calendar year 2023, the Marine Corps doubled the multiplier of continuation pay from 2.5 to 5 for Marines reaching 12 years of service, in 2023 or after. Continuation pay can be placed in a service members TSP and it does count as earned income, so it could place him or her into a higher tax bracket. The member has the option to elect four equal payments spaced over four years to avoid increasing their tax bracket.



Continuation Pay Rates – 2023				
<i>As of March 2, 2023</i>				
Service	Multiplier	Timing	Add'l Obligation	Reference
Army	2.5x AC 4.0x RC	At 12 YOS (AC) At 11 YOS (RC)	4 years	SAMR (637-1)
Marine Corps	5.0x AC 1.0x RC	At 12 YOS	4 years	MARADMIN 084/22
Navy	2.5x AC 0.5x RC	At 12 YOS	4 years	MEMO19MAY22
Air Force	2.5x AC 0.5x RC	At 12 YOS	4 years	
Coast Guard	2.5x AC 0.5x RC	At 12 YOS	4 years	

Figure 4. Continuation Pay Rates for 2023. Source: USBRS (2023).

4. Lump Sum

Upon approaching retirement, military members may elect to receive a lump sum at either 25% or 50% of their estimated retired pay. This election must be made no later than 90 days from their EAS. The percentage they choose is discounted to the present value based on annual DOD discount rate which is published in June every year (Office of Financial Readiness, 2023). The discount rate for calendar year 2023 was 6.32%.

The percentage remaining is then paid in monthly installments as a defined benefit. Upon reaching social security eligibility, currently age 62, they will begin receiving 100% of their defined benefit. It is important to note that the lump sum will count against earned income, so it could place the member into a higher tax bracket. Like continuation pay, service members have the option to elect four equal payments spaced over four years. Regardless of what payment plan is chosen, the first lump sum payment will hit the service members account no later than 60 days from their end of service date (USBRS, 2017).

C. THRIFT SAVINGS PLAN

The TSP is a unique retirement savings and investment plan specifically designed for federal government employees and military service members. It was established by Congress in the Federal Employee’s Retirement System Act of 1986 (TSP, n.d.a). This program offers the same type of savings and tax benefits found in the corporate world under 401(k) plans. The TSP is a defined contribution plan that service members can only



contribute to while employed by the federal government. The TSP used to have base pay contribution limits for participants: 7% in 2002, 8% in 2003, 9% in 2004, 10% in 2005; but lifted those limits in 2006 (TSP, n.d.a).

Government employees utilize payroll deductions to contribute to their TSP. Marines can make changes to their contribution percentage on MyPay. However, when it comes to which type of TSP account the service member contributes to, traditional or Roth, or which funds their TSP money is invested in, the service member must make those changes by logging into their actual TSP account at *www.tsp.gov*. If the participant wants to completely change their portfolio allocation, it is a two-step process. In step one, the money that's currently in the TSP account balance must be adjusted, and in step two, the future contributions must be adjusted to the desired funds.

1. Individual Funds

The TSP is composed of five individual funds, known as the: G-Fund, F-Fund, C-Fund, S-Fund, and I-Fund (TSP, n.d.b). TSP funds are not available to investors outside of the TSP (TSP, n.d.b). It is important to understand what each individual fund represents. Figure 5 shows these five core funds to include information about their objective, return rate for 2023, inception date, associated risk tolerance, and expense ratio.



Funds	G Fund Government Securities Investment Fund	F Fund Fixed Income Index Investment Fund	C Fund Common Stock Index Investment Fund	S Fund Small cap stock Index investment fund	I Fund International Stock Index Investment Fund
Objective	Ensure preservation of capital and generate returns above those of short-term U.S. Treasury securities.	Match the performance of the Bloomberg U.S. Aggregate Bond Index.	Match the performance of the Standard and Poor's 500 (S&P 500) Index.	Match the performance of the Dow Jones U.S. Completion Total Stock Market Index.	Match the performance of the MSCI EAFE (Europe, Australasia, Far East) Index.
Return 2023	4.22%	5.58%	26.25%	25.30%	18.38%
Inception date	4/1/1987	1/29/1988	1/29/1988	5/1/2001	5/1/2001
Risk	● ● ● ● ● Low	● ● ● ● ● Low-medium	● ● ● ● ● Medium	● ● ● ● ● ● Medium-high	● ● ● ● ● ● High
Total expense ratio	0.049%	0.049%	0.048%	0.079%	0.054%

Figure 5. TSP Individual Funds. Source: TSP (n.d.b).

The G-Fund, or the Government Securities Investment Fund, is the safest fund available to service members. In fact, a service member cannot lose money in the G-Fund (TSP, n.d.b). The objective of this fund is to preserve capital, while generating returns that are above short-term United States Treasury securities (TSP, n.d.b). Service members should utilize this fund if they are trying to preserve the wealth of their TSP account. The drawback is that while although they are preserving the money in their portfolio, they are losing out on the opportunity to procure wealth in the long run.

The F-Fund, also known as the Fixed Income Index Investment Fund, aims to replicate the financial performance of the Bloomberg United States Aggregate Bond Index (TSP, n.d.b). Which is a comprehensive benchmark reflecting the United States bond market. Bonds hedge for inflation. Meaning when stock are downs bonds are up, they generally have an inverse relationship when it comes to earnings. The risk tolerance for this fund is low medium (TSP, n.d.b).

The goal of the C-Fund, also known as the Common Stock Index Fund, is to replicate the financial performance of the Standard and Poor's 500 (S&P 500) Index (TSP, n.d.b). This is a comprehensive market benchmark comprising stocks from the 500 largest companies in



the United States. This investment carries higher risk but offers the chance to accrue wealth from owning equities in large and mid-sized United States companies. The S&P 500 is the standard bearer of stocks and wealth accrual in the United States. For young military members, who seek to accrue long term wealth this is a great fund to invest in.

The goal of the S-Fund, also known as the Small Cap Stock Index Investment Fund, is to replicate the financial performance of the Dow Jones United States Completion Total Stock Market Index (TSP, n.d.b). This fund invests in a collection of stocks made up from small to medium sized United States companies that are not included in the S&P 500 Index. This fund is riskier than the powerhouse companies represented in the C-Fund. A good example of this is the effect of Covid-19 on small business. Large companies were better suited to weather mandatory shutdowns, while small companies suffered more due to losses in earnings and revenue. However, investing in this fund allows for portfolio diversification.

The I-Fund, also known as the International Stock Index Investment Fund, seeks to replicate the financial performance of the Morgan Stanley Capital International Europe, Australasia, and Far East (MSCI EAFE) Index (TSP, n.d.b). The TSP website cites this as the riskiest fund. Investing in this fund allows service members to experience gains from equity of ownership of non-United States companies (TSP, n.d.b).

It is important to understand expense ratios. All indexes have an expense ratio which is a percentage that denotes the administrative cost of managing that fund. Holistically, the TSP has lower expense ratios than other retirement funds, which can make it an attractive retirement vehicle to uniformed members. For example, the C-Fund had an expense ratio of 0.048% in 2023. Meaning that at the end of that year for every \$1000 dollars a service member had invested in the C-Fund the TSP took 48 cents from their account to pay for the management of that specific fund (TSP, n.d.b).

2. Life cycle Funds

In 2005 the TSP began offering life cycle funds, which are a diversified mix of the five individual funds: G, F, C, S, and I (TSP, n.d.c). This allows a service member to invest their entire portfolio in a single life cycle fund, that is engineered to redistribute its assets



over time. Life cycle funds auto adjust every quarter gradually moving from a higher risk tolerance to a lower risk tolerance. For a service member, this could take the guess work out of adjusting their own portfolio. It is done for them.

All BRS participants are automatically enrolled into the age-appropriate life cycle fund based off their birth year. TSP regulations 5 CFR § 1601.13 state, “that the default TSP investment fund will be used for new participants who have not made a contribution allocation with the TSP at the time contributions are made” (TSP, n.d.c). Specifically, the TSP uses a target retirement age of 63 to help determine which fund a new service member should be in based off their birth year. The date of birth is pulled from new service member data upon accession (TSP, n.d.c).

Originally, life cycle funds were offered in 10-year increments. However, in 2020 the TSP modified the frequency of life cycle funds from every 10 to five years. Figure 6 shows the recommended TSP life cycle funds for TSP members to invest in based on when they were born and when they anticipate withdrawing money from their portfolio.



Default Fund	For those born in years:	Expected TSP drawdown in:
L Income	1957 or earlier	Already withdrawing, or will start withdrawing before 2021
L 2025	1958 – 1964	2021 – 2027
L 2030	1965 – 1969	2028 – 2032
L 2035	1970 – 1974	2033 – 2037
L 2040	1975 – 1979	2038 – 2042
L 2045	1980 – 1984	2043 – 2047
L 2050	1985 – 1989	2048 – 2052
L 2055	1990 – 1994	2053 – 2057
L 2060	1995 – 1999	2058 – 2062
L 2065	2000 and later	2063 and later

Figure 6. Default L Fund Determination. Source: TSP (n.d.c).

For life cycle funds from L 2055 and on, the TSP significantly modified the risk aversion of the portfolios in its beginning stages. They left less than 1.5% of the total portfolio invested in both the G-Fund and F-Fund. Meaning, the TSP set up these new funds to be invested much more heavily in stocks almost 99% during the first 18 years of the life cycle fund’s existence. Figure 7 shows the L 2065 fund which is the automatic BRS life cycle fund for service members born in the year 2000 or after. This fund is predominantly invested in the C-Fund, S-Fund, and I-Fund in the beginning of its life cycle.



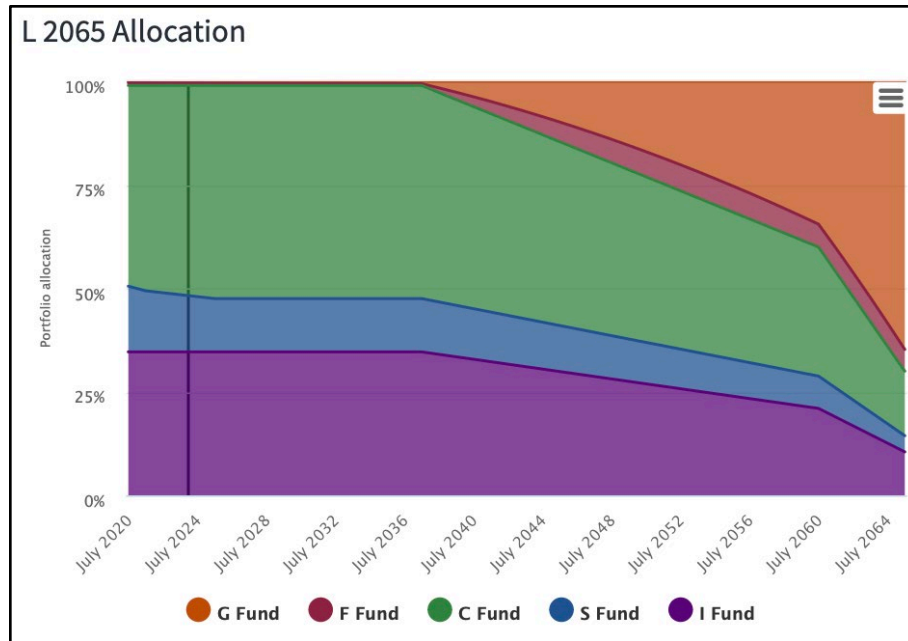


Figure 7. L 2065 Allocation. Source: TSP (n.d.c).

Compared to funds before this timeframe, a service member could potentially see increased gains within their portfolio due the density of stocks in their portfolio throughout the life cycle of that specific fund.

When a life cycle funds reaches its maturation year, in July, it transitions the entire portfolio to the L Income Fund (TSP, n.d.c). Figure 8 shows the L Income Fund allocation. After this transition the service members portfolio is much more heavily invested in government securities, allowing for the preservation of the wealth within their account.

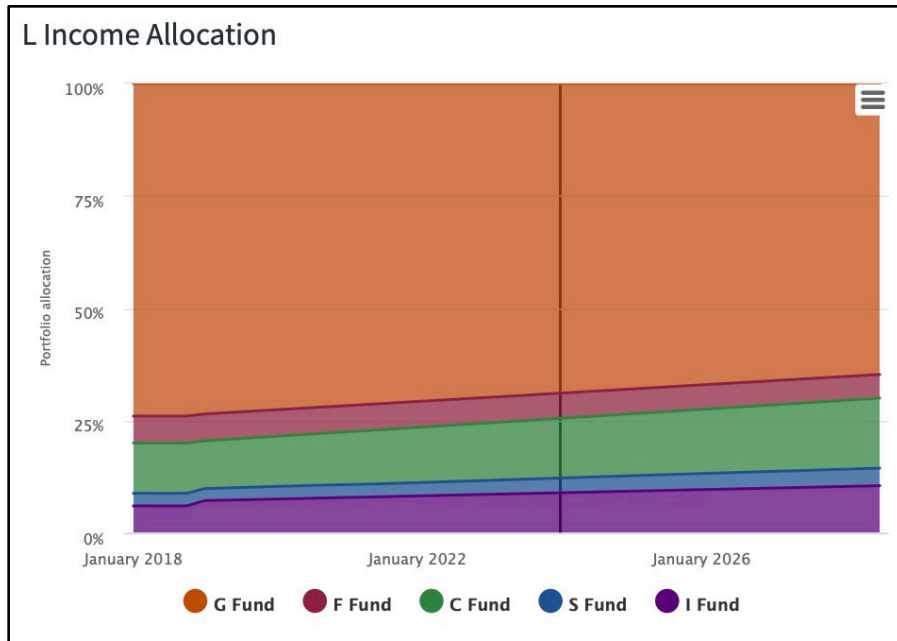


Figure 8. L Income Allocation. Source: TSP (n.d.c).

3. Mutual Fund Window

When it comes to retirement savings, as a CFS I have experienced some service members loathe the lack of diversity or flexibility contained within the individual TSP funds. Instead, they seek other investment opportunities, via individual retirement accounts (IRAs), through investment powerhouses such as Vanguard, Charles Schwab, or Merrell Lynch. To address this issue the TSP began offering a mutual fund window in 2022.

To gain this increased flexibility, eligible TSP participants have the option to incur associated fees and allocate a portion of their TSP savings into mutual funds of their choosing (TSP, 2022). This involves opening a separate investment account through a mutual fund provider. Eligibility rules for this service include: a total TSP account balance of \$40,000 or more, no more than 25% of the total TSP account balance in the mutual fund window at any time, and the initial transfer to the mutual fund window must be \$10,000 or more (TSP, 2022).

There are fees associated with this investment opportunity that include: a \$55 annual administrative fee, \$95 annual maintenance fee, and a \$28.75 per trade fee. These are on top of other fees and expense ratios unique to the mutual fund the member chooses

(TSP, 2022). So, unlike the individual TSP funds, that only charge the expense ratio, these mutual fund opportunity fees could quickly add up.

D. UPDATES TO DEFINED CONTRIBUTIONS

There are three different categories of BRS members, based on how and when they entered the BRS. The first group are BRS Opt-In members, who were not auto enrolled in the TSP. The second group consists of BRS members who entered service between January 1, 2018 – September 30, 2020. This group was auto enrolled into the TSP at 3% of their monthly base pay. The final group are BRS members who entered service from October 1, 2020 – present and were auto enrolled into the TSP at 5% of their monthly base pay.

1. BRS Opt-In Members

During calendar year 2017, military service members with less than 12 years of service had the option to select the legacy retirement plan or the BRS. To select the BRS, service members had to elect that retirement plan with their respective service, otherwise they would be defaulted into the legacy system.

DOD officials were surprised by the percentage of military members who elected the new retirement system across the total force. Table 1 shows these opt-in rates by branch of service. The numbers fell below expectations, contradicting the forecasting models produced by the DOD and the Military Compensation and Retirement Modernization Commission (Philpott, 2019). The opt-in rates even defied computer software from the RAND Corporation which predicted retention decision behavior. Not as many people opted into the new system as they forecasted.

Table 1. Opt-In Rates (Active Duty). Adapted from Philpot (2019).

Branch of Service	Number	Percentage of Population
Marine Corps	84,324	59.4%
Navy	77,351	32.6%
Army	66,301	29.1%
Air Force	89,729	25.5%
Coast Guard	5,115	21.0%



The Marine Corps had the highest opt-in rates across the joint service. During the 2017 BRS election period, the Marine Corps mandated that every Marine who was eligible to choose the legacy or BRS receive mandated service training to help them make their decision, the only service to institute this requirement (Philpott, 2019).

Upon election of this new retirement plan, BRS Opt-in members were automatically given a 1% government contribution match on January 1, 2018. However, they were not automatically enrolled into the TSP, as it related to service member contributions. They had to make this change for themselves. The onus was on this group of service members to enroll in the TSP, set up their contribution percentage, and ensure they received the full match.

2. BRS Members (Automatic 3% Enrollment)

BRS members from January 1, 2018 – September 30, 2020, were auto enrolled into the TSP at 3% of their monthly base pay. To receive the full government match after two years, this group of participants needed to increase their own contribution percentage by two percentage points.

3. BRS Members (Automatic 5% Enrollment)

Beginning on October 1, 2020, the FRTIB changed the default BRS service member contribution percentage to 5% of their monthly base pay. The FRTIB stated that “increasing the default automatic enrollment rate to 5% ensures that the participant receives the full amount of Agency Matching Contributions he or she is entitled to, which, in turn, will improve the participant’s retirement savings outcome” (TSP, 2020). This represents the first group of BRS participants who received the full government match based on default settings. Even if a service member in this group changes their contributions from 5% to 0% they will be, re-enrolled at 5% at the beginning of the next calendar year. It is always automatic, every year.

4. Thrift Savings Fund Statistics 2023

In a September 2023 Thrift Savings Fund Statistics report, the FRTIB stated that for the first time BRS participants finally outnumbered legacy participants (FRTIB, 2023).



Figure 9 shows the data of both legacy and BRS service members as it relates to TSP participation. 77% of legacy service members contribute to their TSP. Meanwhile, the percentage is higher for BRS members with 86% contributing to their TSP.

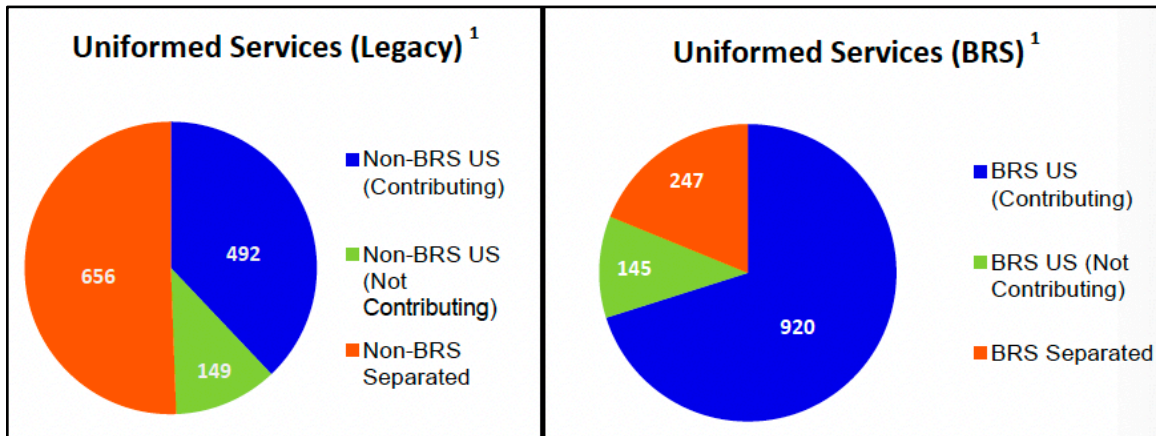


Figure 9. TSP Participant Count for Sep 2023 in Thousands. Source: FRTIB (2023).

The most alarming story to this data set is that there are roughly 145,000 uniformed BRS, or 14% of the population, that is not contributing to their TSP. Meaning they are only receiving the 1% government match and missing out on an additional 4% match each month of active service.

Figure 10 shows the historical matching rates for active-duty service members by FY beginning in 2019. As of FY2023 a new record was set with 84.9% of active duty BRS participants receiving the full match. However, even with these promising results there are still BRS service members who are not participating in the TSP, service members who are not receiving the full government match, and both groups are losing out on government matching contributions.

Examining Figure 10 again, we see a steady increase in active-duty service members receiving their full match. The new policy change from 3% to 5% in FY2020 can be correlated to the 17.7 percentage point increase in full matching contributions across all active-duty service members from FY2020 to FY2023. It is important for service



leadership to realize that 15.1% of the active-duty force is still missing out on full matching government contributions.

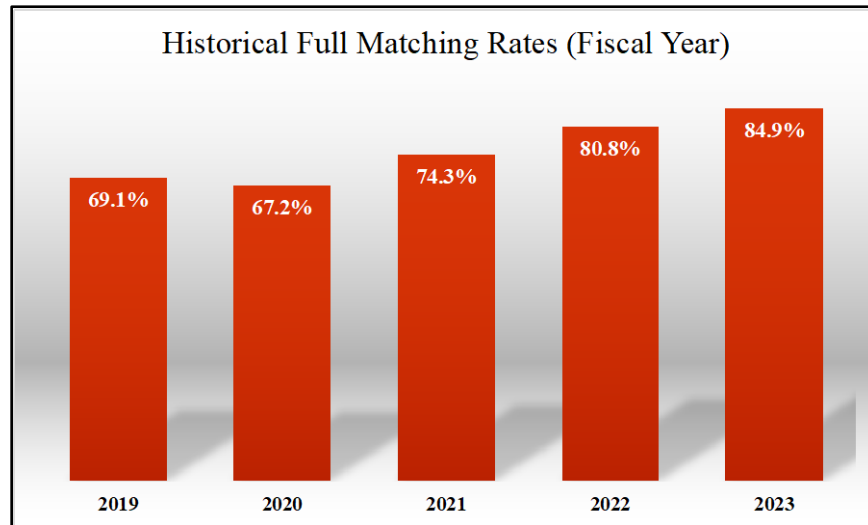


Figure 10. BRS Active-Duty Full Matching Rates by FY. Adapted from FRTIB (2023).

This chapter provided the essential background knowledge to understand important and recent changes to the BRS. By analyzing the evolution of military retirement plans service members are in a better position to understand the intricacies of their plan and why it matters for retirement planning and saving. The four primary components of the BRS provide unique retirement benefits to this group of service members. It is incumbent upon them to understand their own plan and best leverage it to work for their service and retirement needs.

Additionally, changes to the TSP happen frequently. Individual service members and leaders should understand these changes and frequently examine their own TSP portfolios. A holistic review can help ensure the service member is satisfied with what type of retirement fund they are invested in, which individual or life cycle funds they are invested in, and if there are new opportunities within the TSP to better diversify their portfolio.



III. LITERATURE REVIEW

A. FINANCIAL EDUCATION AND RETIREMENT SAVINGS

As retirement planning and saving has changed in America, personal financial education has become a more critical competency. In the 1970s, retirement plans significantly changed from employer provided pensions to a combination of employer and employee retirement contributions, via retirement savings accounts. In an academic report presented at the Retired Implications of Demographic and Family Change Symposium in June of 2002, authors Clark and D'Ambrosio asserted that "American workers will be required to assume greater responsibility for determining their retirement income" (p. 14). The individual worker must decide to participate in a retirement savings plan, how much to contribute, and how to invest their money (Clark & D'Ambrosio, 2002, p. 14). Generation Z, born between 1997 and 2012, is the most likely group of students to have completed a personal finance course during secondary education.

Clark and D'Ambrosio (2002) claimed that "financial knowledge may be the key to achieving one's retirement objectives successfully" (p. 3). They state that an insufficient knowledge base concerning retirement savings may lead to individuals saving too late in life or not saving enough to meet their retirement needs. In a 2023 Ramsey Education report, 80% of 2,353 United States adult respondents surveyed said that high school did not leave them fully equipped to manage finances in practical situations. This same report contended that although United States school systems have always had a "consistent focus on and funding for traditional subjects like math and science, there's been a consistent lack of focus on personal finance education in the classroom" (Ramsey, 2023, p. 2). Of those surveyed, 80% said "they would've had a better start with money if they'd learned more about personal finance in high school" (Ramsey, 2023, p. 3). Currently, 23 states now require a personal finance course to graduate high school (Ramsey, 2023, p. 5). These courses have lasting impacts and lifelong benefits. According to the Ramsey Education report, individuals in the United States who participated in a high school personal finance class were five times more inclined to claim they graduated fully equipped to manage



finances in real-world scenarios, compared to those who lacked personal financial education during secondary education (Ramsey, 2023, p. 5).

B. CHANGES IN MILITARY COMPENSATION AND RETIREMENT

In a 2020 CBO report, Murray and Adedeji discuss the approaches to changing military compensation. They cite that to attract and retain high quality military personnel, “the DOD must offer a compensation package that adequately rewards service members for the rigors of military life” (Murray & Adedeji, 2020, p. 1). This compensation package is a mix of cash, noncash, and deferred compensation. Military retirement is deferred compensation.

Rising costs in terms of military compensation competes with the DOD’s other military needs, including weapons acquisitions, research and development, and system maintenance (Murray & Adedeji, 2020). In their report, the authors estimated that noncash and deferred benefits accounted for 47% of military compensation. When Congress enacted the BRS, government officials worried that a smaller pension could deter service members from serving until retirement. However, as highlighted by Murray and Adedeji, researchers observed that an elevation in cash compensation contributed to an increase in the availability of high-quality enlisted service members and ultimately led to improved retention rates (Murray & Adedeji, 2020).

In a 2018 Congressional Research Service (CRS) report, Burrelli and Kamarack addressed the modifications in the military retirement system from the legacy system to the BRS. They found that during FY2016, “approximately \$57 billion was paid to 2.3 million military retirees and survivors” (Burrelli & Kamarack, 2018, Summary). Considering the scale of the program, the authors noted that some individuals have regarded the military retirement fund as a potential source for significant budgetary savings. Part of this change was the transition to BRS, as costs were modestly rising year to year. Congress approved this change because data indicated “that under the legacy retirement systems, 83% of enlisted and 51% of officers did not complete the 20 years of service and thus received no retirement compensation for their service” (Burrelli & Kamarack, 2018, p. 7).



The Military Retirement Fund (MRF) is the fund that the DOD budget utilizes for retired pay. In 1985, this fund began using the accrual accounting concept, for budgeting costs related to military retired pay (Burrelli & Kamarack, 2018). Harvard Business School defines accrual accounting as “an accounting method that recognizes revenue in the period in which it’s earned and realizable, but not necessarily when the cash is actually received” (Harvard Business School, 2016, para. 3). Burrelli and Kamarack, found that this change in accounting methods left the MRF short of funds. Leaving the DOD to rely on unfunded liability transfers since the MRF was financed each year to pay the strength of “current” service members and not actual retirees (Burrelli & Kamarack, 2018).

C. ROTH VS. TRADITIONAL ACCOUNTS CONTRIBUTIONS

Individuals planning for retirement must decide which type of retirement account to contribute to, when it comes to how their money is taxed. These two types of retirement accounts are Roth and traditional. A Roth retirement account “offers tax-free growth and tax-free withdrawals in retirement” (Vanguard, n.d.a, para. 1). Meanwhile, a traditional retirement account allows you to postpone taxes. It grows tax deferred, and “you’ll pay ordinary income taxes on withdrawals of all traditional IRA earnings and on any contributions you originally deducted on your taxes” (Vanguard, n.d.b). While this is a hard decision, and there are many factors to consider based on your own situation, the general suggestion in this field is to contribute to a Roth account when your tax rate is expected to increase at retirement age and contribute to a traditional account when your tax rate is expected to decrease at retirement age (Hulse, 2023).

One situation does not apply to all service members, but generally if someone is early or in their mid-career it is likely that their salary will go up in the future. Haws Federal Advisors is a financial planning group that conducts retirement planning for federal employees. This group has helped federal employees with retirement planning, preparation, and withdrawals. While one type of account is not the correct one for everyone, Haws Federal Advisors asserts that federal employees are typically in a higher tax bracket at retirement (Haws, 2023). Thus, it may be best for young military members to contribute to a Roth TSP account. If a service member was in a Roth TSP account and



you wanted to make a large withdrawal at retirement, say \$100,000, then their tax bracket would not increase that year because they withdrew tax-free contributions and earnings (Haws, 2021).

In an interesting study by Brown et al. on *Tax Uncertainty and Retirement Savings Diversification* the authors draw two interesting conclusions concerning the type of retirement account an individual should choose. Their analysis looks at various scenarios considering progressive taxes, uncertain future rates, economic value implications from taxes, and differences in the amount of an investor's salary. They conclude that individuals who fall into the lowest two tax brackets (10% or 12% for the 2024 tax schedule) should invest 100% of their retirement savings in Roth accounts (Brown et al., 2016). Meanwhile, they found that other households should allocate their $(Age + 20)\%$ to traditional retirement accounts with the other percentage going into a Roth account (Brown et al., 2016).

Tax Diversification is a strategy that allows investors to take advantage of tax treatment. Under the BRS all government matching contributions enter a traditional TSP account. However, if the service member elects a Roth TSP account for their own individual contributions then they can take advantage tax diversification (Haws, 2023). This allows the service member to select which account they want to pull contributions from at retirement, allowing flexibility in terms of their tax bracket.

Regardless of which type of TSP account the service member elects to contribute to, Roth or traditional, the same amount of money goes into his or her TSP account each month. Traditional TSP contributions are not taxed and this group of service members see a bigger pay check each month, compared to Roth TSP participants (Jerue, 2023).

D. MARINE CORPS LEADERSHIP

1. Leading Marines

Marine Corps Warfighting Publication 6-10 titled "Leading Marines" is the Marine Corps' publication that describes its philosophy and ethos on leading Marines. The document cites that "it is the responsibility of leaders at all levels to mentor and develop the next generation of Marine leaders" (USMC, 2019, p. v). Major General Lejeune, an iconic figure and leader in the Marine Corps, explained the relationship between officer



and enlisted. He likened it to the relationship between a father and son. He stated the leaders are responsible for the well-being and professional and personal development of those they lead, with this relationship extending to their family. It is not uncommon for Marine leaders to ensure the satisfactory living conditions of the Marines and families they are entrusted with.

Teacher and scholar.—The relation between officers and enlisted men should in no sense be that of superior and inferior nor that of master and servant, but rather that of teacher and scholar. In fact, it should partake of the nature of the relation between father and son, to the extent that officers, especially commanding officers, are responsible for the physical, mental, and moral welfare, as well as the discipline and military training of the young men under their command who are serving the nation in the Marine Corps. (USMC, 2019, p. A-11)

This relationship extends to the financial welfare of their Marines. At various commands young Marines are required to make monthly budgets to allot their financial spending plan. Just like “Leading Marines” states, leadership is responsible for the professional and personal development of their Marines. As the retirement plan has changed from the legacy system to the BRS, leadership should ensure their Marines are educated and understand the intricacies of the BRS. This aligns with the Marine Corps’ own doctrine, philosophy, and ethos on taking care of the men and women who wear the uniform.

2. Personal Financial Management Program

Marine Corps Order 17000.37, PFMP, publishes policy and procedures for improving the personal financial stability of all Marines. This is an Inspector General (IG) program which utilizes a functional area checklist, with the frequency of inspection every two years. Commanding Officers are mandated to have one CFS for every 75 Marines in their command. These CFS’ must be an E-6 or above, be command endorsed, and successfully complete the CFS course (USMC, 2014). The duties of a CFS include assisting Marines with basic financial concerns, education, referrals of both Marines and family members to PFMP staff, and providing financial counseling at certain touch points in a Marines career.



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IV. CONCEPTUAL FINANCIAL MODELS

In this Chapter I analyzed the differences in TSP portfolios based on the three BRS demographics and their default settings. Taking the discussion further, I assessed the appropriateness of Roth and traditional TSP account options for enlisted personnel and officers. I concluded with a sensitivity analysis for both enlisted personnel and officers that showcased which option may be more appropriate for that service member based on their expected tax bracket during contributions and anticipated tax bracket during withdrawals at retirement age.

To build a conceptual framework I utilized the future value equation, a managerial financial formula that supports addressing my research questions. I focus on two input variables: a service member's annual TSP contributions and the annual government TSP match; and two outcome variables: the TSP account balance at that service member's EAS and the projected account balance at retirement age.

The key *Future Value Equation* I use in my conceptual model is grounded in the financial management literature Principles of Corporate Finance (Brealey et al., 2020).

$$FV = PV * (1 + r)^t$$

- FV = future value
- PV = present value
- r = interest rate per time period
- t = number of time periods

The financial models I utilized in my analysis are adjustable to alternate scenarios and varying assumptions. These assumptions include but are not limited to variations in TSP payroll contribution percentages, inflation rate projections, rate of return projections, risk comfortability, and variations of investment historical rates of returns from TSP fund.

My analysis assumptions:



- 2024 military pay scale (base year for all wages)
- Annual 3% increase to base pay
- An 8% annual interest rate
- Compounding interest once per year, at the end of the year

I utilized the 2024 military pay scale as the base year for all wages. This is the first year of service for all service members in my analysis. Over the last 18 years, military base pay rose 2.62% on average per year (DOD, n.d.a). To simplify my calculations I round up to 3%.

Annual earnings on TSP portfolios vary depending on which fund the service member is invested in. For my analysis I utilized an 8% annual rate of return which compounds once per year and at the end of every year. Table 2 shows the lifetime rate of return for all active funds in the TSP. Alternate analysis can be completed with variability in the rate of return of my model, if past performance is an indicator of future performance. For the life cycle funds it is important to note the inception year of that fund. Six of the 10 life cycle funds currently available to investors have only been around since 2020.



Table 2. Lifetime Return Rates for Active TSP Funds. Adapted from TSP (n.d.b) and TSP (n.d.c)

TSP Core Funds	Inception Year	Lifetime Return
G-Fund	1987	4.66%
F-Fund	1988	5.34%
C-Fund	1988	10.83%
S-Fund	2001	8.86%
I-Fund	2001	5.02%
TSP L Funds	Inception Year	Lifetime Return
L Income	2005	4.23%
L 2030	2005	6.72%
L 2040	2005	7.27%
L 2050	2011	9.02%
L 2025	2020	7.03%
L 2035	2020	8.98%
L 2045	2020	9.95%
L 2055	2020	12.37%
L 2060	2020	12.37%
L 2065	2020	12.37%

A. ENLISTED BRS DEFAULT SETTINGS

To begin answering my first research question, I examined the three differences in potential TSP earnings based on BRS default settings for enlisted members under the following three demographics during the first four years of active service.

1. BRS Opt-In Members
2. BRS Members (Automatic 3% Enrollment)
3. BRS Members (Automatic 5% Enrollment)

For the enlisted Marine, my analysis examined an enlisted Marine entering active service at 18 years old. In this scenario, the Marine is a Private (E-1) for six months, a Private First Class (E-2) for nine months, a Lance Corporal (E-3) for two years, and a Corporal (E-4) for the remaining nine months for his or her four-year enlistment.



Table 3 shows my calculations for enlisted base pay utilizing the 2024 military pay scale. I begin this four-year enlistment in calendar year (CY) 2024. I then apply a 3% pay raise every year, adjusting the 2024 pay scale for inflation. For example, on the last line of the table the base pay of an E-4 rises from \$2,918.40 in CY24 to \$3,189.01 in CY27, adjusting for three years of inflation.

Table 3. Enlisted Monthly Base Pay (2024 Base Year).

CY24	Rank	Base Pay (CY24)				
	E1	\$2,017.20				
	E2	\$2,261.10				
Less than 2 years						
CY25	Rank	Base Pay (CY24)	Raise			Base Pay (CY25)
	E2	\$2,261.10	3%			\$2,328.93
	E3	\$2,377.50	3%			\$2,448.83
Less than 2 years						
CY26	Rank	Base Pay (CY24)	Raise	Raise	Base Pay (CY26)	
	E3	\$2,526.90	3%	3%	\$2,680.79	
	Over 2 Years					
CY27	Rank	Base Pay (CY24)	Raise	Raise	Raise	Base Pay (CY27)
	E3	\$2,680.20	3%	3%	3%	\$2,928.73
	E4	\$2,918.40	3%	3%	3%	\$3,189.01
Over 3 years						

1. Demographic 1: BRS Opt-In Member

During 2018 service members with less than 12 years of service had the option to opt-in to the BRS or stay with the legacy system. Data showed that 59.4% of active-duty Marines opted-in to the new retirement system (Philpott, 2019). If this group of service members were not contributing to the TSP, then they were not automatically enrolled into the TSP like future demographics. However, the government would automatically match them 1% of their base pay.

Table 4 shows an enlisted Marine who opted-in to the BRS but never started his or her own contributions to the TSP. Thus, during a four-year enlistment he or she only received the 1% government match. This table shows the detailed monthly breakdown as



money enters the enlisted service member's TSP account each CY. The top line of each CY is the service member's contribution amount and the bottom line of each CY is the government matching amount.

Table 4. Enlisted BRS Opt-In Member (TSP Contributions 0%, Government Matching 1%).

	1	2	3	4	5	6	7	8	9	10	11	12	Total
CY24	\$ -	\$ -	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -
	\$ -	\$ -	\$ 20.17	\$ 20.17	\$ 20.17	\$ 20.17	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$ 216.35
												CF1	\$ 216.35
CY25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -
	\$23.29	\$23.29	\$23.29	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$ 290.26
												CF2	\$ 290.26
CY26	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -
	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$26.81	\$ 321.69
												CF3	\$ 321.69
CY27	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -
	\$29.29	\$29.29	\$29.29	\$31.89	\$31.89	\$31.89	\$31.89	\$31.89	\$31.89	\$31.89	\$31.89	\$31.89	\$ 374.87
												CF4	\$ 374.87

At the end of this enlistment there are four government cash flows. In four years the Marine contributed \$0 to their TSP and the government contributed \$1,203.17. Applying an 8% annual rate of return then the Marine left service with \$1,440.06 in his or her TSP account at 22 years old. Table 5 shows this calculation.

Table 5. Enlisted BRS Opt-In Member TSP Account Balance (TSP Contributions 0%, Government Matching 1%).

Cash Flows	Annual Contribution	Rate of Return	Investment Time	Account Balance at End of Service
CY24	\$ 216.35	8%	4	\$ 294.34
CY25	\$ 290.26	8%	3	\$ 365.64
CY26	\$ 321.69	8%	2	\$ 375.22
CY27	\$ 374.87	8%	1	\$ 404.86
			SUM	\$ 1,440.06



If the Marine left their account balance of \$1,440.06 invested in the TSP and it continued to make 8% annually, then we can apply the FV equation to determine the account balance at retirement age. With 38 investment periods this Marine’s account balance would grow to \$26,821.92 at 60 years old.

Future Value (Age 60):

$$FV = \$1,440.06 * (1 + 0.08)^{38} = \$26,821.92$$

2. Demographic 2: BRS Member (Jan 1, 2018–Sept 30, 2020)

BRS members who entered service from January 1, 2018 – September 30, 2020, were automatically enrolled into the TSP at 3% of their base pay. Table 6 shows the detailed monthly breakdown of an enlisted Marine in this demographic. He or she contributed 3% of his or her monthly base pay for all four years of service, from 60 days up until his or her EAS. Meanwhile, the government matches 1% from 60 days to two years, and then 4% from two years until that service member’s EAS.

Table 6. Enlisted BRS Member (TSP Contributions 3%, Government Matching 4%).

CY24	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$ -	\$ -	\$ 60.52	\$ 60.52	\$ 60.52	\$ 60.52	\$67.83	\$67.83	\$67.83	\$67.83	\$67.83	\$67.83	\$ 649.06	
	\$ -	\$ -	\$ 20.17	\$ 20.17	\$ 20.17	\$ 20.17	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$ 216.35	
													CF1	\$ 865.42
CY25	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$69.87	\$69.87	\$69.87	\$73.46	\$73.46	\$73.46	\$73.46	\$73.46	\$73.46	\$73.46	\$73.46	\$73.46	\$ 870.79	
	\$23.29	\$23.29	\$23.29	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$ 290.26	
													CF2	\$ 1,161.05
CY26	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$80.42	\$ 965.08	
	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$107.23	\$ 1,286.78	
													CF3	\$ 2,251.86
CY27	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$87.86	\$87.86	\$87.86	\$95.67	\$95.67	\$95.67	\$95.67	\$95.67	\$95.67	\$95.67	\$95.67	\$95.67	\$ 1,124.62	
	\$117.15	\$117.15	\$117.15	\$127.56	\$127.56	\$127.56	\$127.56	\$127.56	\$127.56	\$127.56	\$127.56	\$127.56	\$ 1,499.49	
													CF4	\$ 2,624.11

At the end of the enlistment there are four cash flows, calculated by adding both the service member and government contributions. In four years the Marine contributed



\$3,609.55 to their TSP and the government contributed \$3,292,89. Applying an 8% annual rate of return then the Marine left service with \$8,100.59 in his or her TSP account at 22 years old. Table 7 shows this calculation.

Table 7. Enlisted BRS Member TSP Account Balance (TSP Contributions 3%, Government Matching 4%).

Cash Flows	Annual Contribution	Rate of Return	Investment Time	Account Balance at End of Service
CY24	\$ 865.42	8%	4	\$ 1,177.39
CY25	\$ 1,161.05	8%	3	\$ 1,462.59
CY26	\$ 2,251.86	8%	2	\$ 2,626.57
CY27	\$ 2,624.11	8%	1	\$ 2,834.04
			SUM	\$ 8,100.59

If the Marine left their account balance of \$8,100.59 invested in the TSP and it continued to make 8% annually, then we can apply the FV equation to determine the account balance at retirement age. With 38 investment periods this Marine’s account balance would grow to \$150,875.75 at 60 years old.

Future Value (Age 60):

$$FV = \$8,100.59 * (1 + 0.08)^{38} = \$150,875.75$$

3. Demographic 3: BRS Member (Oct 1, 2020–Present)

BRS members who entered service October 1, 2020 – present are automatically enrolled into the TSP at 5% of their base pay. Table 8 shows the detailed monthly breakdown of an enlisted Marine in this demographic. He or she contributed 5% of his or her base pay for all four years of service, from 60 days up until his or her EAS. Meanwhile, the government matches 1% from 60 days to two years, and then 5% from two years until that service member’s EAS.



Table 8. Enlisted BRS Member (TSP Contributions 5%, Government Matching 5%).

CY24	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$ -	\$ -	\$ 100.86	\$ 100.86	\$ 100.86	\$ 100.86	\$113.06	\$113.06	\$113.06	\$113.06	\$113.06	\$113.06	\$ 1,081.77
	\$ -	\$ -	\$ 20.17	\$ 20.17	\$ 20.17	\$ 20.17	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$ 216.35
												CF1	\$ 1,298.12
CY25	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$116.45	\$116.45	\$116.45	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$ 1,451.31
	\$23.29	\$23.29	\$23.29	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$ 290.26
												CF2	\$ 1,741.57
CY26	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$ 1,608.47
	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$ 1,608.47
												CF3	\$ 3,216.95
CY27	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$146.44	\$146.44	\$146.44	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$ 1,874.37
	\$146.44	\$146.44	\$146.44	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$ 1,874.37
												CF4	\$ 3,748.73

In four years the Marine contributed \$6,015.92 to their TSP and the government contributed \$3,989.45. Applying an 8% annual rate of return then the Marine left service with \$11,760.83 in his or her TSP account at 22 years old. Table 9 shows this calculation.

Table 9. Enlisted BRS Member TSP Account Balance (TSP Contributions 5%, Government Matching 5%).

Cash Flows	Annual Contribution	Rate of Return	Investment Time	Account Balance at End of Service
CY24	\$ 1,298.12	8%	4	\$ 1,766.08
CY25	\$ 1,741.57	8%	3	\$ 2,193.88
CY26	\$ 3,216.95	8%	2	\$ 3,752.25
CY27	\$ 3,748.73	8%	1	\$ 4,048.63
			SUM	\$ 11,760.83

If the Marine left their account balance of \$11,760.83 invested in the TSP and it continued to make 8% annually, then we can apply the FV equation to determine the account balance at retirement age. With 38 investment periods this Marine's account balance would grow to \$219,048.88 at 60 years old.



Future Value (Age 60):

$$FV = \$11,760.83 * (1 + 0.08)^{38} = \$219,048.88$$

B. OFFICER BRS DEFAULT SETTINGS

To finish answering my first research question, I examined the three differences in potential TSP earnings based on BRS default settings for officers under the following three demographics during the first four years of active service.

1. BRS Opt-In Members
2. BRS Members (Automatic 3% Enrollment)
3. BRS Members (Automatic 5% Enrollment)

For the officer in my analysis, I examined a Marine officer who begins active service at 22 years old. In this scenario, the Marine spends two years as a Second Lieutenant (O-1) and the remaining two years of service as a First Lieutenant (O-2).

Table 10 shows my calculations for the officer base pay utilizing the 2024 military pay scale. I then apply a 3% pay raise every year, adjusting the 2024 pay scale for inflation. For example, the last line of the table shows the base pay of an O-2, over three years. The monthly base pay rises from \$5,782.80 in CY24 to \$6,319.02 in CY27.



Table 10. Officer Monthly Base Pay (2024 Base Year).

CY24	Rank	Base Pay (CY24)				
	O1	\$3,816.20				
Less than 2 years						
CY25	Rank	Base Pay (CY24)	Raise			Base Pay (CY25)
	O1	\$3,816.20	3%			\$3,930.69
Less than 2 years						
CY26	Rank	Base Pay (CY24)	Raise	Raise	Base Pay (CY26)	
	O2	\$5,020.80	3%	3%	\$5,326.57	
Over 2 Years						
CY27	Rank	Base Pay (CY24)	Raise	Raise	Raise	Base Pay (CY27)
	O2	\$5,782.80	3%	3%	3%	\$6,319.02
Over 3 years						

1. Demographic 1: BRS Opt-In Member

Table 11 shows a Marine officer who opted-in to the BRS but never started his or her own contributions to the TSP. This officer only received the 1% government match. This table shows the detailed monthly breakdown as money enters his or her TSP account. The top line of each CY is the service member's contribution amount and the bottom line of each CY is the government matching amount.



Table 11. Officer BRS Opt-In Member (TSP Contributions 0%, Government Matching 1%).

CY24	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$ -	\$ -	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -	
	\$ -	\$ -	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 381.62	
												CF1	\$ 381.62	
CY25	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -	
	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$ 471.68	
													CF2	\$ 471.68
CY26	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -	
	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$53.27	\$ 639.19	
													CF3	\$ 639.19
CY27	1	2	3	4	5	6	7	8	9	10	11	12	Total	
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ -	
	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$63.19	\$ 758.28	
													CF4	\$ 758.28

At the end of four years there are four cash flows. In four years the Marine contributed \$0 to their TSP and the government contributed \$2,250.77. Applying an 8% annual rate of return the Marine officer left service with \$2,677.87 in their TSP account at 26 years old. Table 12 shows this calculation.

Table 12. Officer BRS Opt-In Member TSP Account Balance (TSP Contributions 0%, Government Matching 1%).

Cash Flows	Annual Contribution	Rate of Return	Investment Time	Account Balance at End of Service
CY24	\$ 381.62	8%	4	\$ 519.19
CY25	\$ 471.68	8%	3	\$ 594.18
CY26	\$ 639.19	8%	2	\$ 745.55
CY27	\$ 758.28	8%	1	\$ 818.94
			SUM	\$ 2,677.86

If the Marine officer left their account balance of \$2,677.86 invested in the TSP and it continued to make 8% annually, then we can apply the FV equation to determine the account balance at retirement age. With 34 investment periods this Marine's account balance would grow to \$36,660.32 at 60 years old.



Future Value Equation (Age 60):

$$FV = \$2,677.86 * (1 + 0.08)^{34} = \$36,660.32$$

2. Demographic 2: BRS Member (Jan 1, 2018–Sept 30, 2020)

BRS members who entered service from January 1, 2018–September 30, 2020 were automatically enrolled into the TSP at 3% of their base pay. This officer contributed 3% of his or her monthly base pay for all four years of service, from 60 days up until his or her EAS. Meanwhile, the government matched 1% from 60 days to two years, and then 4% from two years until that service member’s EAS. Table 13 shows the detailed monthly breakdown of an officer in this demographic.

Table 13. Officer BRS Member (TSP Contributions 3%, Government Matching 4%).

	1	2	3	4	5	6	7	8	9	10	11	12	Total
CY24	\$ -	\$ -	\$114.49	\$114.49	\$114.49	\$114.49	\$114.49	\$114.49	\$114.49	\$114.49	\$114.49	\$114.49	\$ 1,144.86
	\$ -	\$ -	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 381.62
												CF1	\$ 1,526.48
CY25	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$117.92	\$ 1,415.05
	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$ 471.68
												CF2	\$ 1,886.73
CY26	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$159.80	\$ 1,917.56
	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$213.06	\$ 2,556.75
												CF3	\$ 4,474.32
CY27	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$189.57	\$ 2,274.85
	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$252.76	\$ 3,033.13
												CF4	\$ 5,307.98

At the end of the enlistment there are four cash flows, calculated by adding both the service member and government contributions. In four years the Marine contributed \$6,752.32 to their TSP and the government contributed \$6,443.18. Applying an 8% annual rate of return then the Marine officer left service with \$15,404.96 in their TSP account at 26 years old. Table 14 shows this calculation.



Table 14. Officer BRS Opt-In Member TSP Account Balance (TSP Contributions 3%, Government Matching 4%).

Cash Flows	Annual Contribution	Rate of Return	Investment Time	Account Balance at End of Service
CY24	\$ 1,526.48	8%	4	\$ 2,076.76
CY25	\$ 1,886.73	8%	3	\$ 2,376.74
CY26	\$ 4,474.32	8%	2	\$ 5,218.85
CY27	\$ 5,307.98	8%	1	\$ 5,732.62
			SUM	\$ 15,404.96

If the Marine officer left their account balance of \$15,404.96 invested in the TSP and it continued to make 8% annually, then we can apply the FV equation to determine the account balance at retirement age. With 34 investment periods this Marine’s account balance would grow to \$210,895.97 at 60 years old.

Future Value Equation (Age 60):

$$FV = \$15,404.96 * (1 + 0.08)^{34} = \$210,895.97$$

3. Demographic 3: BRS Member (Oct 1, 2020–Present)

BRS members who entered service October 1, 2020–present are automatically enrolled into the TSP at 5% of their base pay. Table 15 shows the detailed monthly breakdown of an officer in this demographic.



Table 15. Officer BRS Member (TSP Contributions 5%, Government Matching 5%).

CY24	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$ -	\$ -	\$190.81	\$190.81	\$190.81	\$190.81	\$190.81	\$190.81	\$190.81	\$190.81	\$190.81	\$190.81	\$ 1,908.10
	\$ -	\$ -	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 381.62
												CF1	\$ 2,289.72
CY25	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$ 2,358.41
	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$ 471.68
												CF2	\$ 2,830.09
CY26	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$ 3,195.94
	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$ 3,195.94
												CF3	\$ 6,391.88
CY27	1	2	3	4	5	6	7	8	9	10	11	12	Total
	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$ 3,791.41
	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$ 3,791.41
												CF4	\$ 7,582.83

In four years the Marine contributed \$11,253.86 to their TSP and the government contributed \$7,840.66. Applying an 8% annual rate of return then the Marine officer left service with \$22,325.18 in their TSP account at 26 years old. Table 16 shows this calculation.

Table 16. Officer BRS Opt-In Member TSP Account Balance (TSP Contributions 5%, Government Matching 5%).

Cash Flows	Annual Contribution	Rate of Return	Investment Time	Account Balance at End of Service
CY24	\$ 2,289.72	8%	4	\$ 3,115.14
CY25	\$ 2,830.09	8%	3	\$ 3,565.10
CY26	\$ 6,391.88	8%	2	\$ 7,455.49
CY27	\$ 7,582.83	8%	1	\$ 8,189.46
			SUM	\$ 22,325.18

If the Marine officer left their account balance of \$22,325.18 invested in the TSP and it continued to make 8% annually, then we can apply the FV equation to determine the account balance at retirement age. With 34 investment periods this Marine's account balance would grow to \$305,634.74 at 60 years old.



Future Value Equation (Age 60):

$$FV = \$22,325.18 * (1 + 0.08)^{34} = \$305,634.74$$

C. ROTH VS. TRADITIONAL

To answer my follow-on research questions about which type of TSP account, Roth or traditional, is better I examined the following financial models: service members, both enlisted and officer, who are contributing exactly 5% of their monthly base pay and receiving the full government match of 5% every month. For enlisted service members I analyze the difference in potential earnings over a four-year, eight-year, and 20-year-career enlistment. Meanwhile for officers, I analyze the difference in potential earnings serving four years, seven years, and a 20-year-career.

An easy way to make this computation in managerial finance is to find the future value of each cash flow at a particular point in time. For this analysis I want to know what those values are at retirement age, which is 60 years old. Summing these future values will yield the total account balance.

Future Value Information Enlisted Marine:

- Enlists 18 years old
- 42 compounding cash flows to age 60

Future Value Information Enlisted Marine Officer:

- Begins service at 22 years old
- 38 compounding cash flows to age 60

Enlisted Marine Timeline:

- Private (E-1) for six months
- Private First Class (E-2) for nine months
- Lance Corporal (E-3) for two years



- Corporal (E-4) for two years and nine months
- Sergeant (E-5) for three years
- Staff Sergeant (E-6) for four years
- Gunnery Sergeant (E-7) for four years
- First Sergeant (E-8) for three years

Marine Officer Career Timeline:

- Second Lieutenant (O-1) for two years
- First Lieutenant (O-2) for three years
- Captain (O-3) for five years
- Major (O-4) for five years
- Lieutenant Colonel (O-5) for five years

1. Enlisted Summary of Results

Tables 17–22 detail the differences in a Roth and traditional TSP account for enlisted service members over a four-year, eight-year, and 20-year-career enlistment.



Table 17. BRS Four-Year Enlistment (5% Member Roth TSP Contributions).

Roth TSP Cash Flows	Present Value Roth Dollars	Rate of Return	Investment Time	Future Value Roth Dollars	
CF1	\$ 1,081.77	0.08	42	\$ 27,411.49	
CF2	\$ 1,451.31	0.08	41	\$ 34,051.36	
CF3	\$ 1,608.47	0.08	40	\$ 34,943.30	
CF4	\$ 1,874.37	0.08	39	\$ 37,703.42	
			SUM	\$ 134,109.58	
Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars	
CF1	\$ 216.35	0.08	42	\$ 5,482.30	
CF2	\$ 290.26	0.08	41	\$ 6,810.27	
CF3	\$ 1,608.47	0.08	40	\$ 34,943.30	
CF4	\$ 1,874.37	0.08	39	\$ 37,703.42	
			SUM	\$ 84,939.30	
				Account Total	\$ 219,048.88

Note. The \$134,109.58 in Roth contributions and earnings is tax free when the service member makes withdrawals from their account after age 60.

Table 18. BRS Four-Year Enlistment (5% Member Traditional TSP Contributions).

Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars	
CF1	\$ 1,298.12	0.08	42	\$ 32,893.79	
CF2	\$ 1,741.57	0.08	41	\$ 40,861.64	
CF3	\$ 3,216.95	0.08	40	\$ 69,886.61	
CF4	\$ 3,748.73	0.08	39	\$ 75,406.84	
			SUM	\$ 219,048.88	
				Account Total	\$ 219,048.88

Note. The entire account balance \$219,048.88 is taxable when the service member makes withdrawals from their account.



Table 19. BRS Eight-Year Enlistment (5% Member Roth TSP Contributions).

Roth TSP Cash Flows	Present Value Roth Dollars	Rate of Return	Investment Time	Future Value Roth Dollars
CF1	\$ 1,081.77	0.08	42	\$ 27,411.49
CF2	\$ 1,451.31	0.08	41	\$ 34,051.36
CF3	\$ 1,608.47	0.08	40	\$ 34,943.30
CF4	\$ 1,874.37	0.08	39	\$ 37,703.42
CF5	\$ 2,070.69	0.08	38	\$ 38,567.15
CF6	\$ 2,132.81	0.08	37	\$ 36,781.63
CF7	\$ 2,580.44	0.08	36	\$ 41,204.95
CF8	\$ 2,657.86	0.08	35	\$ 39,297.31
SUM				\$ 289,960.62
Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 216.35	0.08	42	\$ 5,482.30
CF2	\$ 290.26	0.08	41	\$ 6,810.27
CF3	\$ 1,608.47	0.08	40	\$ 34,943.30
CF4	\$ 1,874.37	0.08	39	\$ 37,703.42
CF5	\$ 2,070.69	0.08	38	\$ 38,567.15
CF6	\$ 2,132.81	0.08	37	\$ 36,781.63
CF7	\$ 2,580.44	0.08	36	\$ 41,204.95
CF8	\$ 2,657.86	0.08	35	\$ 39,297.31
SUM				\$ 240,790.34
Account Total				\$ 530,750.96

Note. The \$289,960.62 in Roth contributions and earnings is tax free when the service member makes withdrawals from their account after age 60.

Table 20. BRS Eight-Year Enlistment (5% Member Traditional TSP Contributions).

Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 1,298.12	0.08	42	\$ 32,893.79
CF2	\$ 1,741.57	0.08	41	\$ 40,861.64
CF3	\$ 3,216.95	0.08	40	\$ 69,886.61
CF4	\$ 3,748.73	0.08	39	\$ 75,406.84
CF5	\$ 4,141.38	0.08	38	\$ 77,134.29
CF6	\$ 4,265.62	0.08	37	\$ 73,563.26
CF7	\$ 5,160.89	0.08	36	\$ 82,409.90
CF8	\$ 5,315.71	0.08	35	\$ 78,594.63
SUM				\$ 530,750.96
Account Total				\$ 530,750.96

Note. The entire account balance \$530,750.96 is taxable when the service member makes withdrawals from their account.



Table 21. BRS 20-Year Career (5% Member Roth TSP Contributions).

Roth TSP Cash Flows	Present Value Roth Dollars	Rate of Return	Investment Time	Future Value Roth Dollars
CF1	\$ 1,081.77	0.08	42	\$ 27,411.49
CF2	\$ 1,451.31	0.08	41	\$ 34,051.36
CF3	\$ 1,608.47	0.08	40	\$ 34,943.30
CF4	\$ 1,874.37	0.08	39	\$ 37,703.42
CF5	\$ 2,070.69	0.08	38	\$ 38,567.15
CF6	\$ 2,132.81	0.08	37	\$ 36,781.63
CF7	\$ 2,580.44	0.08	36	\$ 41,204.95
CF8	\$ 2,657.86	0.08	35	\$ 39,297.31
CF9	\$ 2,925.25	0.08	34	\$ 40,047.07
CF10	\$ 3,329.13	0.08	33	\$ 42,200.20
CF11	\$ 3,538.10	0.08	32	\$ 41,526.99
CF12	\$ 3,644.24	0.08	31	\$ 39,604.45
CF13	\$ 3,977.62	0.08	30	\$ 40,025.39
CF14	\$ 4,542.35	0.08	29	\$ 42,322.33
CF15	\$ 4,882.00	0.08	28	\$ 42,117.57
CF16	\$ 5,028.46	0.08	27	\$ 40,167.68
CF17	\$ 5,326.63	0.08	26	\$ 39,397.64
CF18	\$ 5,895.21	0.08	25	\$ 40,373.21
CF19	\$ 6,414.05	0.08	24	\$ 40,672.67
CF20	\$ 6,606.47	0.08	23	\$ 38,789.67
SUM				\$ 777,205.51
Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 216.35	0.08	42	\$ 5,482.30
CF2	\$ 290.26	0.08	41	\$ 6,810.27
CF3	\$ 1,608.47	0.08	40	\$ 34,943.30
CF4	\$ 1,874.37	0.08	39	\$ 37,703.42
CF5	\$ 2,070.69	0.08	38	\$ 38,567.15
CF6	\$ 2,132.81	0.08	37	\$ 36,781.63
CF7	\$ 2,580.44	0.08	36	\$ 41,204.95
CF8	\$ 2,657.86	0.08	35	\$ 39,297.31
CF9	\$ 2,925.25	0.08	34	\$ 40,047.07
CF10	\$ 3,329.13	0.08	33	\$ 42,200.20
CF11	\$ 3,538.10	0.08	32	\$ 41,526.99
CF12	\$ 3,644.24	0.08	31	\$ 39,604.45
CF13	\$ 3,977.62	0.08	30	\$ 40,025.39
CF14	\$ 4,542.35	0.08	29	\$ 42,322.33
CF15	\$ 4,882.00	0.08	28	\$ 42,117.57
CF16	\$ 5,028.46	0.08	27	\$ 40,167.68
CF17	\$ 5,326.63	0.08	26	\$ 39,397.64
CF18	\$ 5,895.21	0.08	25	\$ 40,373.21
CF19	\$ 6,414.05	0.08	24	\$ 40,672.67
CF20	\$ 6,606.47	0.08	23	\$ 38,789.67
SUM				\$ 728,035.22
Account Total				\$ 1,505,240.73

Note. The \$777,205.51 in Roth contributions and earnings is tax free when the service member makes withdrawals from their account after age 60.



Table 22. BRS 20-Year Career (5% Member Traditional TSP Contributions).

Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 1,298.12	0.08	42	\$ 32,893.79
CF2	\$ 1,741.57	0.08	41	\$ 40,861.64
CF3	\$ 3,216.95	0.08	40	\$ 69,886.61
CF4	\$ 3,748.73	0.08	39	\$ 75,406.84
CF5	\$ 4,141.38	0.08	38	\$ 77,134.29
CF6	\$ 4,265.62	0.08	37	\$ 73,563.26
CF7	\$ 5,160.89	0.08	36	\$ 82,409.90
CF8	\$ 5,315.71	0.08	35	\$ 78,594.63
CF9	\$ 5,850.50	0.08	34	\$ 80,094.15
CF10	\$ 6,658.26	0.08	33	\$ 84,400.40
CF11	\$ 7,076.20	0.08	32	\$ 83,053.99
CF12	\$ 7,288.49	0.08	31	\$ 79,208.90
CF13	\$ 7,955.23	0.08	30	\$ 80,050.77
CF14	\$ 9,084.70	0.08	29	\$ 84,644.67
CF15	\$ 9,764.01	0.08	28	\$ 84,235.14
CF16	\$ 10,056.93	0.08	27	\$ 80,335.37
CF17	\$ 10,653.26	0.08	26	\$ 78,795.28
CF18	\$ 11,790.42	0.08	25	\$ 80,746.42
CF19	\$ 12,828.11	0.08	24	\$ 81,345.34
CF20	\$ 13,212.95	0.08	23	\$ 77,579.35
			SUM	\$ 1,505,240.73
			Account Total	\$ 1,505,240.73

Note. The entire account balance \$1,505,240.73 is taxable when the service member makes withdrawals from their account.

Examining the enlisted summary of results, I found that if the service member elected to make all Roth contributions throughout a four-year enlistment then 61% of the assessed TSP value at age 60, with a 8% annual rate of return, would be Roth money. This share of the account would be tax free upon withdrawal.

For two enlistments, or a total of eight years, then 55% of the assessed TSP value at age 60, with an 8% annual rate of return, would be Roth money. Finally, over the course of a 20 year-career 52% of the assessed TSP value at age 60, with a 8% annual rate of return, would be Roth money. By investing their contributions in a Roth account BRS service members can take advantage of tax diversification.



2. Officer Summary of Results

Tables 23–28 detail the differences in a Roth and traditional TSP account for officer serving four years, seven years, and a 20-year career.

Table 23. BRS Officer Four Years (5% Member Roth TSP Contributions).

Roth TSP Cash Flows	Present Value Roth Dollars	Rate of Return	Investment Time	Future Value Roth Dollars
CF1	\$ 1,908.10	0.08	38	\$ 35,538.89
CF2	\$ 2,358.41	0.08	37	\$ 40,672.28
CF3	\$ 3,195.94	0.08	36	\$ 51,033.32
CF4	\$ 3,791.41	0.08	35	\$ 56,057.35
			SUM	\$ 183,301.84
Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 381.62	0.08	38	\$ 7,107.78
CF2	\$ 471.68	0.08	37	\$ 8,134.46
CF3	\$ 3,195.94	0.08	36	\$ 51,033.32
CF4	\$ 3,791.41	0.08	35	\$ 56,057.35
			SUM	\$ 122,332.90
Account Total				\$ 305,634.74

Note. The \$183,301.84 in Roth contributions and earnings is tax free when the service member makes withdrawals from their account after age 60.

Table 24. BRS Officer Four Years (5% Member Traditional TSP Contributions).

Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 2,289.72	0.08	38	\$ 42,646.67
CF2	\$ 2,830.09	0.08	37	\$ 48,806.74
CF3	\$ 6,391.88	0.08	36	\$ 102,066.64
CF4	\$ 7,582.83	0.08	35	\$ 112,114.69
			SUM	\$ 305,634.74
Account Total				\$ 305,634.74

Note. The entire account balance \$305,634.74 is taxable when the service member makes withdrawals from their account.



Table 25. BRS Officer Seven Years (5% Member Roth TSP Contributions).

Roth TSP Cash Flows	Present Value Roth Dollars	Rate of Return	Investment Time	Future Value Roth Dollars
CF1	\$ 1,908.10	0.08	38	\$ 35,538.89
CF2	\$ 2,358.41	0.08	37	\$ 40,672.28
CF3	\$ 3,195.94	0.08	36	\$ 51,033.32
CF4	\$ 3,791.41	0.08	35	\$ 56,057.35
CF5	\$ 4,037.04	0.08	34	\$ 55,267.65
CF6	\$ 4,734.08	0.08	33	\$ 60,009.45
CF7	\$ 5,110.16	0.08	32	\$ 59,978.39
SUM				\$ 358,557.33
Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 381.62	0.08	38	\$ 7,107.78
CF2	\$ 471.68	0.08	37	\$ 8,134.46
CF3	\$ 3,195.94	0.08	36	\$ 51,033.32
CF4	\$ 3,791.41	0.08	35	\$ 56,057.35
CF5	\$ 4,037.04	0.08	34	\$ 55,267.65
CF6	\$ 4,734.08	0.08	33	\$ 60,009.45
CF7	\$ 5,110.16	0.08	32	\$ 59,978.39
SUM				\$ 297,588.39
Account Total				\$ 656,145.72

Note. The \$358,557.33 in Roth contributions and earnings is tax free when the service member makes withdrawals from their account after age 60.

Table 26. BRS Officer Seven Years (5% Member Traditional TSP Contributions).

Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 2,289.72	0.08	38	\$ 42,646.67
CF2	\$ 2,830.09	0.08	37	\$ 48,806.74
CF3	\$ 6,391.88	0.08	36	\$ 102,066.64
CF4	\$ 7,582.83	0.08	35	\$ 112,114.69
CF5	\$ 8,074.09	0.08	34	\$ 110,535.30
CF6	\$ 9,468.16	0.08	33	\$ 120,018.90
CF7	\$ 10,220.32	0.08	32	\$ 119,956.78
SUM				\$ 656,145.72
Account Total				\$ 656,145.72

Note. The entire account balance \$656,145.72 is taxable when the service member makes withdrawals from their account.



Table 27. BRS Officer 20-Year Career (5% Member Roth TSP Contributions).

Roth TSP Cash Flows	Present Value Roth Dollars	Rate of Return	Investment Time	Future Value Roth Dollars
CF1	\$ 1,908.10	0.08	38	\$ 35,538.89
CF2	\$ 2,358.41	0.08	37	\$ 40,672.28
CF3	\$ 3,195.94	0.08	36	\$ 51,033.32
CF4	\$ 3,791.41	0.08	35	\$ 56,057.35
CF5	\$ 4,037.04	0.08	34	\$ 55,267.65
CF6	\$ 4,734.08	0.08	33	\$ 60,009.45
CF7	\$ 5,110.16	0.08	32	\$ 59,978.39
CF8	\$ 5,263.47	0.08	31	\$ 57,201.61
CF9	\$ 5,693.40	0.08	30	\$ 57,290.70
CF10	\$ 5,864.20	0.08	29	\$ 54,638.35
CF11	\$ 7,002.42	0.08	28	\$ 60,410.64
CF12	\$ 7,212.50	0.08	27	\$ 57,613.86
CF13	\$ 7,798.43	0.08	26	\$ 57,679.92
CF14	\$ 8,032.38	0.08	25	\$ 55,009.56
CF15	\$ 8,546.16	0.08	24	\$ 54,192.76
CF16	\$ 9,233.85	0.08	23	\$ 54,216.24
CF17	\$ 10,111.38	0.08	22	\$ 54,970.95
CF18	\$ 10,414.73	0.08	21	\$ 52,425.99
CF19	\$ 11,030.85	0.08	20	\$ 51,414.30
CF20	\$ 11,361.77	0.08	19	\$ 49,034.01
			SUM	\$ 1,074,656.23
Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 381.62	0.08	38	\$ 7,107.78
CF2	\$ 471.68	0.08	37	\$ 8,134.46
CF3	\$ 3,195.94	0.08	36	\$ 51,033.32
CF4	\$ 3,791.41	0.08	35	\$ 56,057.35
CF5	\$ 4,037.04	0.08	34	\$ 55,267.65
CF6	\$ 4,734.08	0.08	33	\$ 60,009.45
CF7	\$ 5,110.16	0.08	32	\$ 59,978.39
CF8	\$ 5,263.47	0.08	31	\$ 57,201.61
CF9	\$ 5,693.40	0.08	30	\$ 57,290.70
CF10	\$ 5,864.20	0.08	29	\$ 54,638.35
CF11	\$ 7,002.42	0.08	28	\$ 60,410.64
CF12	\$ 7,212.50	0.08	27	\$ 57,613.86
CF13	\$ 7,798.43	0.08	26	\$ 57,679.92
CF14	\$ 8,032.38	0.08	25	\$ 55,009.56
CF15	\$ 8,546.16	0.08	24	\$ 54,192.76
CF16	\$ 9,233.85	0.08	23	\$ 54,216.24
CF17	\$ 10,111.38	0.08	22	\$ 54,970.95
CF18	\$ 10,414.73	0.08	21	\$ 52,425.99
CF19	\$ 11,030.85	0.08	20	\$ 51,414.30
CF20	\$ 11,361.77	0.08	19	\$ 49,034.01
			SUM	\$ 1,013,687.30
Account Total				\$ 2,088,343.53

Note. The \$1,074,656.23 in Roth contributions and earnings is tax free when the service member makes withdrawals from their account after age 60.



Table 28. BRS Officer 20-Year Career (5% Member Traditional TSP Contributions).

Traditional TSP Cash Flows	Present Value Traditional Dollars	Rate of Return	Investment Time	Future Value Traditional Dollars
CF1	\$ 2,289.72	0.08	38	\$ 42,646.67
CF2	\$ 2,830.09	0.08	37	\$ 48,806.74
CF3	\$ 6,391.88	0.08	36	\$ 102,066.64
CF4	\$ 7,582.83	0.08	35	\$ 112,114.69
CF5	\$ 8,074.09	0.08	34	\$ 110,535.30
CF6	\$ 9,468.16	0.08	33	\$ 120,018.90
CF7	\$ 10,220.32	0.08	32	\$ 119,956.78
CF8	\$ 10,526.93	0.08	31	\$ 114,403.23
CF9	\$ 11,386.79	0.08	30	\$ 114,581.40
CF10	\$ 11,728.40	0.08	29	\$ 109,276.70
CF11	\$ 14,004.85	0.08	28	\$ 120,821.29
CF12	\$ 14,424.99	0.08	27	\$ 115,227.71
CF13	\$ 15,596.85	0.08	26	\$ 115,359.85
CF14	\$ 16,064.76	0.08	25	\$ 110,019.11
CF15	\$ 17,092.32	0.08	24	\$ 108,385.52
CF16	\$ 18,467.71	0.08	23	\$ 108,432.49
CF17	\$ 20,222.77	0.08	22	\$ 109,941.89
CF18	\$ 20,829.45	0.08	21	\$ 104,851.99
CF19	\$ 22,061.69	0.08	20	\$ 102,828.61
CF20	\$ 22,723.54	0.08	19	\$ 98,068.03
			SUM	\$ 2,088,343.53
			Account Total	\$ 2,088,343.53

Note. The entire account balance \$2,088,343.53 is taxable when the service member makes withdrawals from their account.

Examining the officer summary of results, I found that if the service member elected to make all Roth contributions throughout four years of service then 60% of the assessed TSP value at age 60, with an 8% annual rate of return, would be Roth money. This share of the account would be tax free upon withdrawal.

If the officer served seven years, then 55% of the assessed TSP value at age 60, with an 8% annual rate of return, would be Roth money. Finally, over the course of a 20 year-career 51% of the assessed TSP value at age 60, with an 8% annual rate of return, would be Roth money. These percentages were very similar to the enlisted summary or results.



D. SENSITIVITY ANALYSIS

Outcomes like the value of the portfolio earnings by age 60 are subject to the assumptions used in each model for each respective group of service members. To show the robustness of my analysis, I conducted a sensitivity analysis in which I focused on varying the initial assumption values for the following metrics.

Metric Assumptions:

- 5% member contributions
 - Roth TSP account
 - Traditional TSP account
- Receive the full government match every month, throughout service timeline
- Use 2024 tax brackets for contribution taxes for all years of service
- Analyze withdrawals from three tax brackets (2024 as a guide; see Figure 11)
- Single tax filer

Tax rate	Single filers	Married filing jointly
37%	\$609,350 or more	\$731,200 or more
35%	\$243,725 - \$609,349.99	\$487,450 - \$731,199.99
32%	\$191,950 - \$243,724.99	\$383,900 - \$487,449.99
24%	\$100,525 - \$191,949.99	\$201,050 - \$383,899.99
22%	\$47,150 - \$100,524.99	\$94,300 - \$201,049.99
12%	\$11,600 - \$47,149.99	\$23,200 - \$94,299.99
10%	\$11,599.99 or less	\$23,199.99 or less

Figure 11. 2024 Federal Tax Brackets. Source: Waggoner (2023).



These metrics are applied for enlisted service members who serve four years, eight years, and a 20-year career, and for BRS officers who serve four years, seven years, and a 20-year career.

1. Enlisted

Assumptions:

- 12% tax bracket for first six years of service
- 22% tax bracket for next 10 years of service
- 24% tax bracket for last four years of service
- Roth member contribution taxes were invested and grew at an 8% rate of return, same rate as the TSP account

Table 29 displays the results of which type of TSP account, Roth or traditional, may be better based on the outlined assumptions. The yellow highlighted cells indicate the better option.

Based on this model, the Roth option was generally best suited for enlisted service members because it was anticipated they would be in a higher tax bracket at retirement and their member contributions started at the age of 18. The results coincide with the general assumption that a Roth TSP account is best if the service member expects to be a higher tax bracket when they make withdrawals and that a traditional TSP account is better if the service member expects to be in a lower tax bracket at retirement.

While all of this is true, there are a few things to keep in mind when comparing the Roth to the traditional option. First, the service members Roth taxes need to be kept in some type of savings account that makes the same interest as their TSP. In this scenario that was 8% life-time. If the service member did not do this, and instead spent that money, then the Roth option would have been better.

Additionally, service members need to think about the dollar amount of their TSP withdrawals. If a service member makes large withdrawals from a traditional account, it



could elevate their tax bracket and cause them to pay more in taxes. Traditionally, the TSP always taxes traditional withdrawals at 20% (Haws, 2023). This is true for both one-time payments and installments that last less than 10 years. When the service member files their taxes each year is when he or she identifies which tax bracket he or she is in. Then they will either need to pay more taxes to the federal government or receive a refund in the form of a tax return.

Table 29. Enlisted Sensitivity Analysis

Four Year Enlistment	Roth TSP	Traditional TSP
Number of Cash Flows	4	4
Portfolio Value at age 60	\$219,048.88	\$219,048.88
Government Contributions & Earnings	\$84,939.30	\$84,939.30
Member Contributions & Earnings	\$134,109.58	\$134,109.58
Contribution Tax Rate (Lifetime)	12%	0%
Roth Tax (TVM) at 8% Returns	\$16,093.15	-
Post Tax Portfolio Value		
12% Withdrawal Tax Rate	\$208,856.16	\$208,856.16
22% Withdrawal Tax Rate	\$200,362.23	\$186,951.28
24% Withdrawal Tax Rate	\$198,663.45	\$182,570.30
Eight Year Enlistment		
Number of Cash Flows	8	8
Portfolio Value at age 60	\$530,750.96	\$530,750.96
Government Contributions & Earnings	\$240,790.34	\$240,790.34
Member Contributions & Earnings	\$289,960.62	\$289,960.62
Contribution Tax Rate (Lifetime)	14.5%	0%
Roth Tax (TVM) at 8% Returns	\$42,845.50	-
Post Tax Portfolio Value		
12% Withdrawal Tax Rate	\$501,856.12	\$509,906.34
22% Withdrawal Tax Rate	\$477,777.09	\$456,831.25
24% Withdrawal Tax Rate	\$472,961.28	\$446,216.23
20-Year Career		
Number of Cash Flows	20	20
Portfolio Value at age 60	\$1,505,240.73	\$1,505,240.73
Government Contributions & Earnings	\$728,035.22	\$728,035.22
Member Contributions & Earnings	\$777,205.51	\$777,205.51
Contribution Tax Rate (Lifetime)	19.4%	0%
Roth Tax (TVM) at 8% Returns	\$153,224.04	-
Post Tax Portfolio Value		
12% Withdrawal Tax Rate	\$1,417,876.50	\$1,477,835.88
22% Withdrawal Tax Rate	\$1,345,072.98	\$1,327,311.81
24% Withdrawal Tax Rate	\$1,330,512.28	\$1,297,206.99

Note. All monetary values are in 2067 dollars.



2. Officers

Assumptions:

- 12% tax bracket for first two years of service
- 22% tax bracket for next eight years of service
- 24% tax bracket for last 10 years of service
- Roth member contribution taxes were invested and grew at an 8% rate of return, same rate as the TSP account

Table 30 displays the results of which type of TSP account, Roth or traditional, may be better based on the outlined assumptions. The yellow highlighted cells indicate the better option.

The results coincide with the general assumption that a Roth TSP account is best if the service member expects to be a higher tax bracket when they make withdrawals and that a traditional TSP account is better if the service member expects to be in a lower tax bracket at retirement.

Generally speaking, Roth was a better option for officers in this analysis because of the assumption they would make more money following active service. This assumption places them in a higher tax bracket. It was unlikely, due to the nature of the officer military pay scale, that they would pay taxes at the 12% rate in the future.



Table 30. Officer Sensitivity Analysis

Four Years	Roth TSP	Traditional TSP
Number of Cash Flows	4	4
Portfolio Value at age 60	\$305,634.74	\$305,634.74
Government Contributions & Earnings	\$122,332.90	\$122,332.90
Member Contributions & Earnings	\$183,301.84	\$183,301.84
Contribution Tax Rate (Lifetime)	17%	0%
Roth Tax (TVM) at 8% Returns	\$32,705.29	-
Post Tax Portfolio Value		
22% Withdrawal Tax Rate	\$278,721.50	\$271,100.39
24% Withdrawal Tax Rate	\$276,274.84	\$264,987.69
32% Withdrawal Tax Rate	\$266,488.21	\$240,536.91
Seven Years		
Number of Cash Flows	7	7
Portfolio Value at age 60	\$656,145.72	\$656,145.72
Government Contributions & Earnings	\$297,588.39	\$297,588.39
Member Contributions & Earnings	\$358,557.33	\$358,557.33
Contribution Tax Rate (Lifetime)	19.1%	0%
Roth Tax (TVM) at 8% Returns	\$71,261.50	-
Post Tax Portfolio Value		
22% Withdrawal Tax Rate	\$590,676.27	\$583,055.16
24% Withdrawal Tax Rate	\$584,724.51	\$569,932.25
32% Withdrawal Tax Rate	\$560,917.44	\$517,440.59
20-Year Career		
Number of Cash Flows	20	20
Portfolio Value at age 60	\$2,088,343.53	\$2,088,343.53
Government Contributions & Earnings	\$1,013,687.30	\$1,013,687.30
Member Contributions & Earnings	\$1,074,656.23	\$1,074,656.23
Contribution Tax Rate (Lifetime)	22.0%	0%
Roth Tax (TVM) at 8% Returns	\$239,742.62	-
Post Tax Portfolio Value		
22% Withdrawal Tax Rate	\$1,865,332.32	\$1,868,650.57
24% Withdrawal Tax Rate	\$1,845,058.58	\$1,826,883.70
32% Withdrawal Tax Rate	\$1,763,963.59	\$1,659,816.22

Note. All monetary values are in 2067 dollars.

E. SUMMARY

My conceptual financial models focused on two input variables: a service member's annual TSP contributions and the annual government TSP match; and two outcome variables: the TSP account balance at that service member's EAS and the projected account



balance at retirement age. For the input variables I addressed the three BRS demographics based on default settings. Personally, I contend that most service members are passive investors, relying on default settings. I have seen this firsthand working as a CFS. However, with a little informed knowledge and help, service members can audit their own portfolios and optimize their own retirement savings based on their personal financial situation.

BRS members should ensure they receive the full retirement benefit entitled to them under this retirement plan. At a minimum they should contribute 5% of their monthly base pay to their TSP. The potential differences in earnings and the importance of the time value of money cannot be understated as we saw the differences amongst all three demographics, both enlisted and officer. If a service member can, they should invest more than the 5% minimum to receive the full government match. Alternate analysis can be conducted using my conceptual financial models under other parameters.

Additionally, it is prudent for a service member to understand which type of retirement account they are investing in, Roth versus traditional, and what it means for their own financial savings plan. This is a critical factor that our young service members should be educated in, knowledge checked on, and routinely counseled on for greater financial literacy across the total force.



V. CONCLUSION AND RECOMMENDATIONS

A. FINDINGS AND DISCUSSION

Military retirement plans have changed over time. The rollout of the BRS placed more onus on the individual service member to be actively involved in their own retirement planning and saving. The aim of this thesis was to bring awareness to BRS policy changes to current senior levels of leadership, so they can help guide those they lead to make informed financial decisions. It also aimed to provide support to current BRS service members to better understand the specifics of the BRS and make informed decisions for themselves.

The analysis included in this thesis used a conceptual model developed on future value methodology to examine differences in potential TSP earnings based on BRS default settings for the following three demographics: BRS Opt-In Members, BRS Members (Automatic 3% Enrollment), and BRS Members (Automatic 5% Enrollment). It also looked at the differences in potential earnings based on the type of TSP account, Roth versus traditional, for enlisted service members serving four years, eight years, or a 20 year-career. In addition, the thesis examined the differences in potential earnings based on the type of TSP account, Roth versus traditional, for officers serving four years, seven years, or a 20 year-career. The conceptual financial model I used is adjustable to different scenarios and assumptions that may fit specific demographics of service members.

My thesis findings outlined the differences in TSP contributions for the three different BRS demographics based on default settings. Table 31 shows the three differences amongst these demographics as it relates to their TSP account balance after the end of four years of service and their potential earnings at age 60 factoring in an 8% annual rate of return.



Table 31. Differences in Potential TSP Earnings Based on BRS Default Settings

Enlisted BRS Demographics	TSP Balance (EAS)	TSP Balance (Age 60)
1. BRS Opt-In Member	\$ 1,440.06	\$ 26,821.92
2. BRS Member (Auto 3% Enrollment)	\$ 8,100.59	\$ 150,875.75
3. BRS Member (Auto 5% Enrollment)	\$ 11,760.83	\$ 219,048.88
Officer BRS Demographics	TSP Balance (EAS)	TSP Balance (Age 60)
1. BRS Opt-In Member	\$ 2,677.86	\$ 36,660.32
2. BRS Member (Auto 3% Enrollment)	\$ 15,404.96	\$ 210,895.97
3. BRS Member (Auto 5% Enrollment)	\$ 22,325.18	\$ 305,634.74

Currently, there are 145,000 BRS members not contributing to their TSP and every month this group of service members are missing out on a retirement benefit. More can be done by leadership to ensure BRS participants are knowledgeable about their own retirement entitlements.

Most of today’s senior military leadership are members of the legacy system. A knowledge gap may exist with this echelon of leaders as it relates to the BRS. Over time, this disparity in retirement plans amongst military members will change. Eventually, the old demographics of the legacy system, BRS opt-in, and BRS members auto-enrolled at 3% will exit service.

When it comes to identifying which type of TSP account a service member should invest in, Roth or traditional, the answer is it just depends. However, further financial education and considering variables such as age, annual salary, spouse employment, and current tax rate all play a critical role in this determination. I have personal experience with CFS’ who advocated one way or the other. It just depends on your own situation and what you presume your tax bracket to be in the future. Personally, I choose Roth.

B. SHORT-TERM RECOMMENDATIONS (ACTIONABLE NOW)

1. S-1 Command Audits

Commanders and select leadership, across all battalions and squadrons, have access to their Marines information on Marine Online (MOL). A plethora of information exists on



this platform from a Marine's basic individual record, basic training record, record of emergency data, and pay and leave summary. There is also a tab titled "BRS/TSP."

This tab contains beneficial information to the Marine leader. It shows how much a Marine is contributing to their TSP. It also shows which contribution percentages are going into either a traditional or Roth TSP account, or both. For Marines, who began serving before January 1, 2018, it indicates their BRS election decision with the following codes: 'O' for opt-in, 'Z' for opt-out, and no code for no decision (defaulted into the legacy plan).

Marine commanders could have their administrative branches audit the "BRS/TSP" tab for all Marines in their command. Doing so would result in the commander knowing the percentage breakdown of legacy and BRS members in his or her command, which BRS Marines are not receiving the full government match, and which type of TSP account his or her Marines are contributing to.

2. Marine Intrusive Leadership

Using the information from the S-1 administrative command audit, the commander can apply Marine intrusive leadership by having his or her subordinate leaders use this information for formal counseling. These subordinate leaders can sit down with each Marine and discuss their TSP savings. This practice could help those who are losing out on government matching contributions by educating them and having these members make the necessary changes to their TSP account.

C. LONG-TERM RECOMMENDATIONS

1. Strengthening Personal Financial Management

As stated, the PFMP is a Marine Corps IG functional area for all commands. The Marine Corps can bolster this inspection sheet by having the command and respective CFS' report the percentage of Marines losing out on government matching contributions who are enrolled in BRS. Additionally, they can report the traditional versus Roth percentage of Marines in the command. This information would benefit the IG, the commander, and PMFP staff aboard that installation.



2. Continuing Financial Education

This information is not meant to be a hindrance to the command or an extra thing they must do, but rather something Marine leaders should do, guided by the service's ethos. As General Lejeune said, "the relation between officers and enlisted men should in no sense be that of superior and inferior nor that of master and servant, but rather that of teacher and scholar... it should partake of the nature of the relation between father and son" (USMC, 2019).

D. SUGGESTIONS FOR FUTURE RESEARCH

Further analysis could be conducted that considers a different mix of TSP options. For example, projecting a rate of return for someone who is invested 70% in the C-Fund and 30% in S-Fund. This data analysis could potentially predict the optimal TSP portfolio mix for a given year. Using the past as a paradigm, it is conceivable that military retirement plans will continue to evolve. It would be interesting to see what happens to the MRF if defined benefits stopped and the government relied solely on defined contributions.



APPENDIX A. ENLISTED CAREER MODEL DATA

CY	Rank	Base Pay (CY24)	Raise	Annual Salary	Tax Rate	1	2	3	4	5	6	7	8	9	10	11	12	Total
CY24	E1	\$2,017.20		\$25,669.80	12%	\$ -	\$ -	\$ 100.86	\$ 100.86	\$ 100.86	\$ 100.86	\$113.06	\$113.06	\$113.06	\$113.06	\$113.06	\$113.06	\$ 1,081.77
	E2	\$2,261.10				\$ -	\$ -	\$ 20.17	\$ 20.17	\$ 20.17	\$ 20.17	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61	\$22.61
	Less than 2																	
CY25	E2	\$2,261.10	1x	\$2,448.83	12%	\$116.45	\$116.45	\$116.45	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$122.44	\$ 1,451.31
	E3	\$2,377.50	1x			\$28,666.55	\$23.29	\$23.29	\$23.29	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49	\$24.49
	Less than 2																	
CY26	E3	\$2,526.90	2x	\$2,680.79	12%	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$ 1,608.47
						\$32,169.46	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04	\$134.04
	Over 2																	
CY27	E3	\$2,680.20	3x	\$3,189.01	12%	\$146.44	\$146.44	\$146.44	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$ 1,874.37
	E4	\$2,918.40	3x			\$37,487.31	\$146.44	\$146.44	\$146.44	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45	\$159.45
	Over 3																	
CY28	E4	\$3,066.30	4x	\$3,451.15	12%	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$ 2,070.69
						\$41,413.77	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56	\$172.56
	Over 4																	
CY29	E4	\$3,066.30	5x	\$3,554.68	12%	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$ 2,132.81
						\$42,656.19	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73	\$177.73
	Over 5																	
CY30	E5	\$3,601.80	6x	\$4,300.74	22%	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$ 2,580.44
						\$51,608.85	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04	\$215.04
	Over 6																	
CY31	E5	\$3,601.80	7x	\$4,429.76	22%	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$ 2,657.86
						\$53,157.12	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49	\$221.49
	Over 7																	
CY32	E5	\$3,848.70	8x	\$4,875.42	22%	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$ 2,925.25
						\$58,505.02	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77	\$243.77
	Over 8																	
CY33	E6	\$4,252.50	9x	\$5,548.55	22%	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$ 3,329.13
						\$66,582.58	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43	\$277.43
	Over 9																	
CY34	E6	\$4,387.80	10x	\$5,896.84	22%	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$ 3,538.10
						\$70,762.04	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84	\$294.84
	Over 10																	
CY35	E6	\$4,387.80	11x	\$6,073.74	22%	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$ 3,644.24
						\$72,884.90	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69	\$303.69
	Over 11																	
CY36	E6	\$4,649.70	12x	\$6,629.36	22%	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$ 3,977.62
						\$79,552.32	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47	\$331.47
	Over 12																	
CY37	E7	\$5,155.20	13x	\$7,570.58	22%	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$ 4,542.35
						\$90,847.02	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53	\$378.53
	Over 13																	
CY38	E7	\$5,379.30	14x	\$8,136.67	22%	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$ 4,882.00
						\$97,640.09	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83	\$406.83
	Over 14																	
CY39	E7	\$5,379.30	15x	\$8,380.77	22%	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$ 5,028.46
						\$100,569.29	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04	\$419.04
	Over 15																	
CY40	E7	\$5,532.30	16x	\$8,877.72	24%	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$ 5,326.63
						\$106,532.61	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89	\$443.89
	Over 16																	
CY41	E8	\$5,944.50	17x	\$9,825.35	24%	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$ 5,895.21
						\$117,904.23	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27	\$491.27
	Over 17																	
CY42	E8	\$6,279.30	18x	\$10,690.09	24%	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$ 6,414.05
						\$128,281.06	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50	\$534.50
	Over 18																	
CY43	E8	\$6,279.30	19x	\$11,010.79	24%	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$ 6,606.47
						\$132,129.49	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54	\$550.54
	Over 19																	



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APPENDIX B. OFFICER CAREER MODEL DATA

CY	Rank	Base Pay (CY24)	Raise	Annual Salary	Tax Rate	1	2	3	4	5	6	7	8	9	10	11	12	Total	
CY24	O1	\$3,816.20	Less than 2	\$45,794.40	12%	\$ -	\$ -	\$ 190.81	\$ 190.81	\$ 190.81	\$ 190.81	\$ 190.81	\$ 190.81	\$ 190.81	\$ 190.81	\$ 190.81	\$ 190.81	\$ 1,908.10	
						\$ -	\$ -	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 38.16	\$ 381.62	
																		CF1	\$ 2,289.72
CY25	O1	\$3,816.20	1x	\$3,930.69		\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$196.53	\$ 2,358.41	
				\$47,168.23	12%	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$39.31	\$ 471.68	
																		CF2	\$ 2,830.09
CY26	O2	\$5,020.80	2x	\$5,326.57		\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$ 3,195.94	
			Over 2	\$63,918.80	22%	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$266.33	\$ 3,195.94
																		CF3	\$ 6,391.88
CY27	O2	\$5,782.80	3x	\$6,319.02		\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$3,791.41	
			Over 3	\$75,828.26	22%	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$315.95	\$3,791.41
																		CF4	\$ 7,582.83
CY28	O2	\$5,978.10	4x	\$6,728.40		\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$4,037.04	
			Over 4	\$80,740.85	22%	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$336.42	\$4,037.04
																		CF5	\$ 8,074.09
CY29	O3	\$6,806.10	5x	\$7,890.14		\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$4,734.08	
			Over 5	\$94,681.62	22%	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$394.51	\$4,734.08
																		CF6	\$ 9,468.16
CY30	O3	\$7,132.80	6x	\$8,516.94		\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$5,110.16	
			Over 6	\$102,203.23	22%	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$425.85	\$5,110.16
																		CF7	\$ 10,220.32
CY31	O3	\$7,132.80	7x	\$8,772.44		\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$5,263.47	
			Over 7	\$105,269.33	22%	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$438.62	\$5,263.47
																		CF8	\$ 10,526.93
CY32	O3	\$7,490.70	8x	\$9,488.99		\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$5,693.40	
			Over 8	\$113,867.94	22%	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$474.45	\$5,693.40
																		CF9	\$ 11,386.79
CY33	O3	\$7,490.70	9x	\$9,773.66		\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$5,864.20	
			Over 9	\$117,283.97	22%	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$488.68	\$5,864.20
																		CF10	\$ 11,728.40
CY34	O4	\$8,684.10	10x	\$11,670.70		\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$7,002.42	
			Over 10	\$140,048.45	24%	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$583.54	\$7,002.42
																		CF11	\$ 14,004.85
CY35	O4	\$8,684.10	11x	\$12,020.83		\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$7,212.50	
			Over 11	\$144,249.90	24%	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$601.04	\$7,212.50
																		CF12	\$ 14,424.99
CY36	O4	\$9,116.10	12x	\$12,997.38		\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$7,798.43	
			Over 12	\$155,968.55	24%	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$649.87	\$7,798.43
																		CF13	\$ 15,596.85
CY37	O4	\$9,116.10	13x	\$13,387.30		\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$8,032.38	
			Over 13	\$160,647.60	24%	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$669.37	\$8,032.38
																		CF14	\$ 16,064.76
CY38	O4	\$9,416.70	14x	\$14,243.60		\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$8,546.16	
			Over 14	\$170,923.24	24%	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$712.18	\$8,546.16
																		CF15	\$ 17,092.32
CY39	O5	\$9,878.10	15x	\$15,389.76		\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$9,233.85	
			Over 15	\$184,677.10	24%	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$769.49	\$9,233.85
																		CF16	\$ 18,467.71
CY40	O5	\$10,501.80	16x	\$16,852.31		\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$10,111.38	
			Over 16	\$202,227.67	24%	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$842.62	\$10,111.38
																		CF17	\$ 20,222.77
CY41	O5	\$10,501.80	17x	\$17,357.88		\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$10,414.73	
			Over 17	\$208,294.50	24%	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$867.89	\$10,414.73
																		CF18	\$ 20,829.45
CY42	O5	\$10,799.10	18x	\$18,384.74		\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$11,030.85	
			Over 18	\$220,616.94	24%	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$919.24	\$11,030.85
																		CF19	\$ 22,061.69
CY43	O5	\$10,799.10	19x	\$18,936.29		\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$11,361.77	
			Over 19	\$227,235.45	24%	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$946.81	\$11,361.77
																		CF20	\$ 22,723.54



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