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# Cost-Benefit Analysis of Fire Controlman Aegis Regular Military Compensation versus Civilian Wages

June 2023

**LT Jeffrey A. Pichardo, USN**

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Department of Defense Management

**Naval Postgraduate School**



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




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# COST-BENEFIT ANALYSIS OF FIRE CONTROLMAN AEGIS REGULAR MILITARY COMPENSATION VERSUS CIVILIAN WAGES

## ABSTRACT

Retention initiatives play a crucial role in maintaining combat-ready forces. Retention has become a pressing issue due to the declining interest among individuals to join the military, the low unemployment rate, and the current labor market's attractive compensation packages for critical skills. This thesis compares military and civilian pay within similar occupations, explicitly focusing on servicemembers specializing in highly technical fields like U.S. Navy Fire Controlman Aegis (FCA). In particular, this thesis uses data from the U.S. Bureau of Labor Statistics (BLS) to calculate the net present value (NPV) of Regular Military Compensation (RMC) in conjunction with Selective Reenlistment Bonuses (SRB) to assess the comparability of compensation packages with civilian wages. Military compensation, even for specialized roles like FCA, offers a higher net present value than civilian compensation. This underscores the significance of acknowledging and preserving compensation differentials to ensure the retention of skilled military personnel.

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# ACKNOWLEDGMENTS

I would like to extend my heartfelt gratitude to Dr. Amilcar Menichini and Dr. Jesse Cunha for their invaluable guidance throughout this process.

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# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BLS | U. S. Bureau of Labor Statistics |
| DOL | U.S. Department of Labor |
| FCA | U.S. Navy Fire Controlman Aegis |
| MOS | military occupational specialty |
| NPV | net present value |
| RMC | regular military compensation |
| SRB | selective reenlistment bonuses |
| TMC | total military compensation |

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# I. INTRODUCTION

## A. CONTEXT

Since 1973, following the end of the military draft during the Vietnam War, the U.S. military has relied on an all-volunteer force. President Nixon saw the decision to end the draft as a political strategy and believed that the middle class would be less likely to protest the war if they were not at risk of being drafted and sent to fight (Glass, 2012). Interestingly, public opinion on U.S. involvement in conflicts seems to impact interest in joining the military. For example, the aftermath of 9/11 saw a surge in military applications, and the same happened after the 2008 recession (Borg, 2022, p. 98). Therefore, while war itself may not be a deterrent to joining the military, the public perception of U.S. involvement in conflicts is a significant factor in the willingness of individuals to serve.

When considering a job, potential applicants typically seek an organization that aligns with their values. This is often a crucial factor for individuals considering service in the military. However, systemic issues that the armed services need more control over may deter some individuals. For instance, a lack of education, prior criminal records, and obesity are some of the main reasons for ineligibility (Borg, 2022, p. 99). While the military may not have direct authority to address these issues through policy, it can create adaptive internal policies and advocate for policymakers to take corrective action. By doing so, the military can work towards creating a more inclusive and equitable system that allows individuals with the necessary skills and values to serve their country.

## B. PROBLEM

Retaining service members is crucial for the military as it faces numerous challenges in recruitment, such as education, past criminal records, and obesity. However, the military has faced a significant shift in understanding the impact of education and standardized testing on recruitment. Currently, the military services require a high school diploma or GED as the minimum requirement for entry, and they assess the recruit's quality based on their high school graduation and AFQT scores. However, despite the Army's

efforts to recruit high school graduates, only 85% of public high school students graduated in 2018, making it challenging to maximize eligibility (Borg, 2022, p. 99).

Recruiters face the challenge of dealing with criminal records, as nearly one-third of American adults have one. However, determining what constitutes a criminal record can be vague, and the severity of the crime can vary significantly. For instance, RAND reports that other organizations, such as police agencies, disqualify more applicants with poor credit scores than those with a history of drug use; the standards for a criminal record are not always clear (Wilson, 2010, p. 25).

Obesity presents similar challenges as military service is physically demanding, and millions of people are ineligible to serve due to height and weight standards. Since 1959, the number of civilians heavier than the Army's enlistment requirements has increased (Cawley & Maclean, 2012). Although the military imposes body fat standards on military personnel, studies indicate that military populations are increasingly becoming overweight, reflecting the trend observed among the general population. Moreover, "there are conflicting reports on the relationship between BMI and physical performance" in military personnel (Cawley & Maclean, p.697). For example, limited research has suggested that overweight and obese individuals are not at a higher risk of being discharged within their first year of military service compared to those of normal weight. Instead, being underweight appears to be a stronger predictor. However, it remains unclear how weight affects performance. Nevertheless, addressing the potential risks associated with obesity and chronic disease presents a dilemma we must resolve (McLaughlin & Wittert, 2009, p. 693).

The military's response to the obesity issue may not be decisive because there are conflicting guidance on fitness. Moreover, factors such as declining physical activity and eating patterns, like the Southern diet, contribute to the rising obesity rate, which is not improving, particularly in the Southern United States. As a result, an armed force already struggling to meet minimum manning requirements should be wary of the catastrophic impact of modern warfare (Borg, 2022, p. 99).

The United States military is renowned for its excellence, with superior tactics and highly skilled personnel. However, despite being an all-volunteer force, the military faces significant challenges in meeting recruitment and retention goals across all branches. While this is not a new issue, the implications have never been more serious, as declining interest in military service threatens the country's ability to protect itself and its allies from potential adversaries. Therefore, assessing whether the U.S. military can sustain all its national security objectives with only an all-volunteer force is crucial. In addition, the Department of Defense has observed that military recruitment tends to decrease during low unemployment rate periods, while recruitment tends to increase when unemployment rates are high. Figure 1 illustrates this relationship by showing the "percentage of new enlistment contracts each year over the period 1990–2010 that were high quality" (Warner, 2012, p. 73).

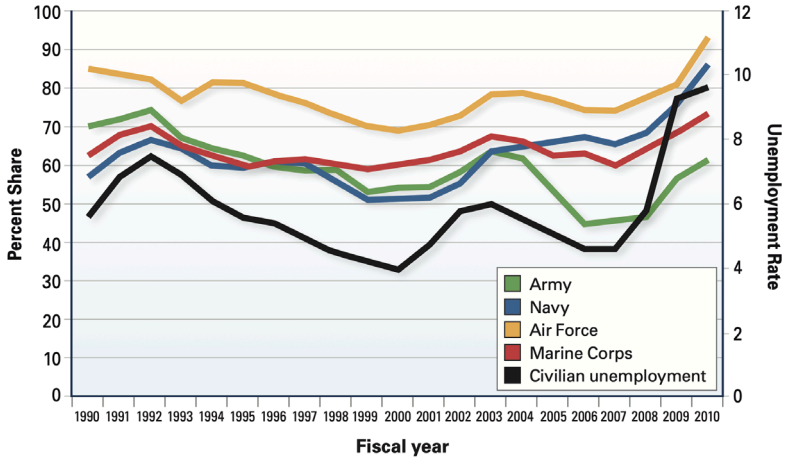


**Figure 1. High-Quality Enlistments by Service and Unemployment, Fiscal Year 1990–2010**

Figure 1. New enlistment by service and unemployment of HQ recruits. Source: Warner (2012).

"HQ recruits are thus defined to be recruits who possess both a high school diploma and score above 50 on the Armed Forces Qualification Test (AFQT)" (Warner, 2012, p. 73), which is a subset of the ASVAB. The Navy requires a diverse range of highly skilled individuals with specific critical roles that demand higher qualifications determined by the

ASVAB tests. Each MOS or rating has a specific minimum score requirement, and potential applicants may qualify for positions in the Advanced Electronics Field (AEF), Advanced Technical Field (ATF), or Nuclear Field (NF). Enrolling in these programs allows for initial "A" school training and accelerated pay grade advancement upon boot camp graduation (Department of the Navy, 2022). Table 6 in the Appendix lists Navy ratings falling within the AEF/ATF field.

A modern navy's ability to defend itself is a top priority. The Aegis system, which employs the latest surface combat technology in the Navy, is operated by sailors with an FCA (Fire Controlman Aegis) rating. This sophisticated system integrates advanced missile and radar technologies to safeguard Navy ships against missile threats such as antiair, anti-surface, and anti-subsurface attacks. However, in the past, the Navy has raised concerns about the shortage of FCA personnel, which is critical to mission success, and established an FCA Action Group to address the issue of filling FCA billets at sea (Monroe, 2007).

Despite a decrease in the number of ships over time, Figure 2 shows that the average deployment of ships has remained at approximately 100 for the last thirty years. However, the Navy has reported that it can only fulfill about half of the requests made by theater commanders for Navy ships, even though these requests are unrestricted by resources. It is not unexpected that the demand exceeds the supply under these circumstances (Cancian, 2020). This shortage raises concerns for the Navy, not just in terms of ships but also regarding the personnel required to operate them.

Considering the recruiting issues discussed above, understanding the reasons why individuals choose a military career becomes of primary importance. These reasons encompass the desire for a specific type of work or lifestyle, job security, future benefits, and financial compensation. This thesis places its focus on the financial component by conducting a comparative analysis between military compensation and three equivalent civilian positions. The above discussion is good, but I feel like you should talk about the financial aspect of the career choice, which relates directly to your research questions. Maybe add a sentence or paragraph here which links the preceding discussion with the research question. Something like "In light of the recruiting issues discussed above, it is of

primary importance to understand the reasons why individuals choose a military career. These reasons include desire for the type of work or lifestyle, the security of the job, the future benefits of the career choice, and the financial compensation. In this thesis, I focus on the financial component by doing."

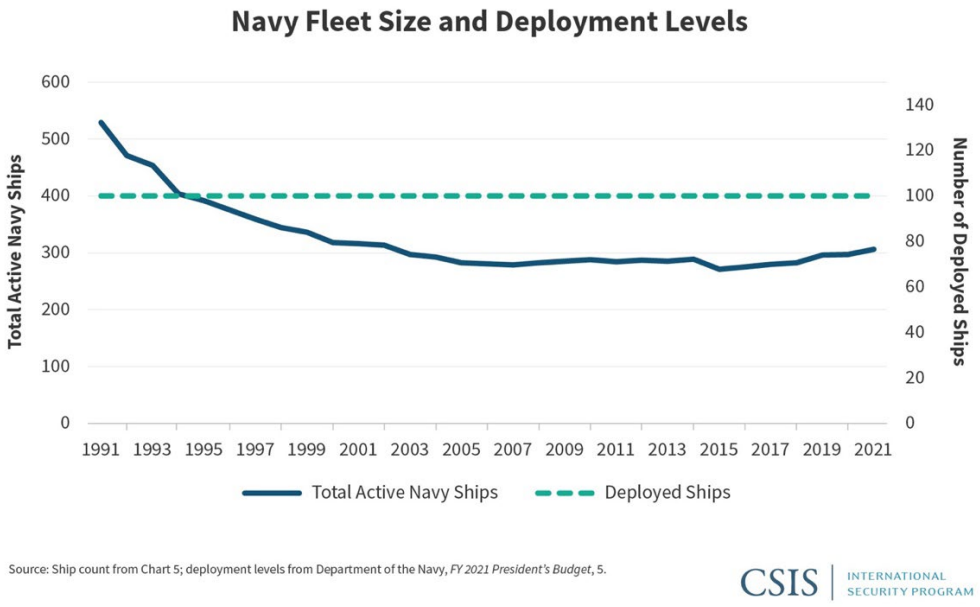


Figure 2. Illustration of total active navy ships and the number of deployed ships. Source: Cancian (2022).

## C. RESEARCH QUESTION

The primary research question aims to determine whether the net present value (NPV) of military compensation for an FCA is higher, lower, or the same as that of civilian compensation packages in 2017.

## D. ORGANIZATION

The organization of this is as follows: first, we examine the compensation package of an active duty service member; second, we compare this compensation to a comparable civilian position that the service member could obtain if they were to leave the military; third, we calculate the net present value of staying on active duty versus leaving the military

and securing a civilian job with equivalent wages based on the information gathered in the previous steps. Finally, we present our conclusions and recommendations based on the findings.

## E. METHODOLOGY

This analysis explicitly compares the wages of an FCA rating, a bottom ten retention career field in the U.S. Navy, with those of a civilian computer technician. Firstly, I am conducting an empirical comparison between the two careers. However, if someone intends to utilize this comparison to make policy recommendations, they must consider the limitations I have outlined. It is crucial to acknowledge that this limited scope is based on certain assumptions. For instance, it assumes that the skills and job requirements of an FCA and a civilian computer technician are sufficiently similar to enable a meaningful comparison. Additionally, it assumes that factors such as job security, benefits, and working conditions are roughly equivalent between the military and civilian sectors, although this may not always be the case. Lastly, it assumes that financial considerations are the primary factor influencing the decision of an FCA to reenlist or leave the military, disregarding the wide range of personal and professional aspects that may come into play.

## F. FCA JOB DESCRIPTION

Analysts have used data from the U.S. Bureau of Labor Statistics (BLS) to argue that, in general, military pay is higher than civilian pay (Smith et al., 2020) (need a citation to claim this). However, this is not always true for servicemembers with a Military Occupational Specialty (MOS) in highly technical fields. Finding a civilian occupational field comparable to a military occupational specialty can be challenging due to the unique nature of service members' jobs. However, we have made significant progress in assisting veterans in finding job opportunities that align with their education, skills, or training.

> FCAs are technicians responsible for the operation, maintenance, testing, troubleshooting, and repair of: RADAR, computers, networks, data display systems and integrated weapons system components. The Aegis Weapon System provides theater, air, and sea missile defense. Aegis technicians are knowledgeable in basic electronics, digital fundamentals, synchros, servos, RADAR principles, the fire control problem and computer fundamentals.

> Aegis technicians serve on Ticonderoga Class Cruisers and Arleigh Burke Class Destroyers. (Department of Defense [DOD] n.d.a)

## G. COMPARATIVE TOOLS

To find civilian occupations comparable to an FCA, I utilized The Department of Defense (DOD) Credentialing Opportunities On-Line (COOL) program, which offers collaborative efforts among military branches to assist Service members in obtaining credentials based on their work experience and training. The DOD Civilian COOL website provides federal civilian employees with comprehensive information on relevant certifications and licenses and background details on credentialing and related subjects. Furthermore, the Military Occupations Explorer allows individuals to investigate the connections between military occupations, civilian occupations, and civilian credentials across multiple military branches.

Additionally, the Department of Labor sponsors the occupational information network (O*NET), which has released a tool called "crosswalk" that allows service members to select their military occupational specialty and find comparable civilian employment job titles based on detailed descriptions of their roles and responsibilities (Department of Labor [DOL], n.d.b). This tool provides an extensive list of options.

For this analysis, we assume that the service member exiting military service would seek employment comparable to the pay they would receive if they remained on active duty. The top three most closely related occupational descriptions to an FCA are Computer Network Support Specialists, Computer Network Architects, and Network and Computer Systems Administrators. See Table 7 in the Appendix military and civilian job titles for a list of FCA-comparable civilian employment.

## H. FCA CIVILIAN MATCHES

Although all are professionals who work with computer networks, their specific roles and responsibilities differ:

> **Computer Network Support Specialists** provide technical support and assistance to organizations and individuals who use computer networks. They troubleshoot network and computer system issues, install, and maintain network hardware and software, and ensure network security and

connectivity. They may also train end-users on network operations and maintenance.

**Computer Network Architects** design and build computer networks, including LANs, WANs, and intranets, to meet an organization's specific needs. They determine the hardware, software, and connectivity requirements, and work with network engineers and technicians to implement the network design. They also evaluate and recommend new technologies to improve network performance and security.

**Network and Computer Systems Administrators** are responsible for computer networks' day-to-day operation and maintenance. They install and configure network hardware and software, monitor network performance and security, and troubleshoot network issues. They also manage user accounts, access permissions, and data backups, and ensure network connectivity and availability. (U.S. Bureau of Labor Statistics [BLS], 2022). Keeping this in mind, the occupation of Computer Network Architect matches the skill level required of a Fire Controlman and offers comparable wages.

For example, when comparing the median weekly earnings of a U.S. Navy Fire Controlman Aegis (FCA) to its civilian counterpart (15-1143) Computer Network Architects in 2017, it becomes clear that the latter earns more salary on average at $1,636 per week, compared to an FCA's Regular Military Compensation (RMC) of $1,200. RMC encompasses the aggregation of fundamental salary, housing stipend (BAH), subsistence stipend (BAS), and the exclusive federal tax advantage arising from the non-taxation of allowances. Notably, there may be more significant variability in earnings among civilian occupations than service members, who receive uniform pay. This variability could be due to various factors such as experience level, geographical location, and market conditions. For instance, the mean wage for computer network architects in 2017 was $107,870, but this amount varied significantly by state, with earnings in Montana at $83,230 and in California at $133,190 (Figure 3).

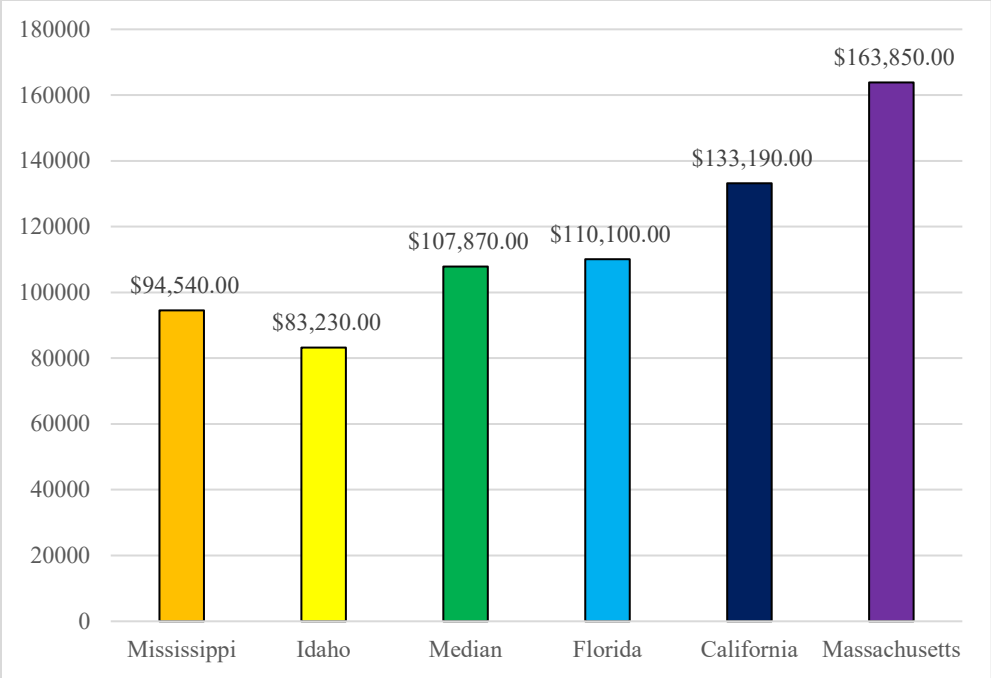


Figure 3. 2017 computer network architect annual mean wage. Source: BLS (2017).

The U.S. Navy offers Selective Reenlistment Bonuses (SRB) to retain servicemembers with critical skills. In 2017, an FCA's SRB could be as high as $75,000. Therefore, this report aims to conduct a cost-benefit analysis from the perspective of FCA servicemembers, specifically focusing on the financial implications of reenlisting or transitioning to civilian employment. The objective is to determine which option would be more financially advantageous for the individual servicemember. Therefore, this report aims to conduct a cost-benefit analysis of whether an FCA servicemember would be better off monetarily reenlisting or leaving the military to work as a civilian. Of course, military pay alone is not the sole motivator of a servicemember's decision to reenlist. However, policymakers should know whether services are executing RMC's goal of providing comparable wages.

This analysis aims to utilize NPV comparison to understand better how service members can use this information when deciding whether to continue in service or transition to civilian life.

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# II. LITERATURE REVIEW

Based on the previous findings, retention appears to be a more significant challenge than recruitment in the military. It is also worth noting that we can address the considerable dissatisfaction observed within the culture of service members by educating them about their compensation and benefits. When comparing military compensation to civilian compensation, Hodges (2015) finds that financial compensation is a significant determining factor for individuals, and military compensation is more stable than civilian jobs. Overall, the military must focus on retaining talented individuals and providing education on the value derived from the total package of compensation and benefits.

## A. RETENTION

According to Borg (2022), "the Department of Defense has historically found ways to overcome manpower shortfalls"(p. 107) He notes that the military has used more contractors, utilized reservists more efficiently, and increased the number of Department of Defense, civilians to overcome recruitment and retention problems. While obesity, previous criminal records, and lack of education remain underlying concerns, Borg argues that we can work around them to some extent. He emphasizes current defense strategic guidance heavily prioritizes technological modernization over a force structure increase and implements better talent management systems to improve the quality-of-service members. However, he also notes that retention is a significant concern and that the military needs to focus on retaining talented individuals. Overall, Borg (2022) suggests that "there should be no significant problems recruiting a sufficiently large force in the medium- to long-term" (p.108) and that the long-term outlook for the U.S. in terms of recruitment potential appears promising.

Perez and Jansen (2018) found that the current military compensation system is reasonable and provides service members with adequate compensation, including a substantial RMC for both enlisted and officer personnel. However, service members, as a collective, often evaluate the opportunities within the civilian sector and contemplate whether they offer more attractive financial incentives because there needs to be more

education and information on the value of their pay. The study suggests that a culture of dissatisfaction exists, and we can address it by educating service members about their RMC. In addition, many service members need to pay more attention to the significance of having tax-free allowances when assessing financial packages offered in the civilian sector. We can achieve this education through an aggressive campaign that relies on social media and strategic planning by leadership. While improving the current versus deferred compensation system may require changes to policies and procedures, educating service members is a low-cost and effective method to enhance retention among junior personnel.

## B. COMPENSATION COMPARISONS

In their 2021 study, Osborne, Sr., Sanders, and Trybanski thoroughly examined the Military Occupational Specialty (MOS) 17C in the U.S. Army, covering entrance requirements, specialized training, benefits, reasons for attrition, and geographical locations. The MOS 17C has strict entrance requirements, necessitating high General Technical (GT) and Skilled Technical (ST) scores. The training provided to Army cyber personnel is precious, as it equips them with skills in demand in the civilian world and can earn them high salaries as cybersecurity professionals. The U.S. Army offers extensive benefits to its soldiers, but retention efforts could be affected by the perception that better civilian opportunities exist outside the Army. Factors such as failure to adapt or the lure of related civilian careers may contribute to attrition rates among 17C soldiers. Additionally, the authors highlight that the retention of soldiers is significantly influenced by duty location, particularly for 17C personnel stationed in limited duty stations after completing Basic Training (BT) and Advanced Individual Training (AIT).

In Hodges' (2015) financial analysis, a computation based on Net Present Value (NPV) was employed using a 5% discount rate, as well as an inflation rate of 2.0% based on the long-term target rate of the Federal Reserve. Additionally, we factored in a tax adjustment of 15% to account for the real value of non-taxable allowances received by military pilots compared to individuals whose total earnings would be subject to taxation. This analysis aimed to compare the retirement benefits of military pilots with leaving the service to pursue a career in the civilian airline industry.

While the analysis only considers financial compensation and does not account for intangible benefits, such as job satisfaction or job stability, it argues that individuals prioritize monetary compensation as a significant factor. Retaining in the military and retiring as a pilot results in higher pay and offers greater predictability regarding financial compensation. Unlike civilian pilots, whose financial remuneration exhibits a broader range of variation, the decision to leave military service and transition to the commercial pilot industry entails increased risk. According to the analysis, military compensation provides higher payouts during the initial eight years of retirement than entering the airline industry and retaining in military service until retirement positions veterans in a more advantageous scenario. The rationale behind this is that individuals who opt for an airline job without retirement benefits can expect a significant salary reduction in their first year of employment. In contrast, retirees entering the airline industry, with the advantage of a supplementary pension income alongside their earnings, experience a comparatively smaller decline in pay during their initial year. Specifically, the disparity is 62% for those without retirement benefits and 28% for retirees. The overarching advice in the article suggests that pilots primarily focused on financial considerations would benefit more from staying in military service until they meet the eligibility requirements for retirement.

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# III. COMPENSATION COMPARISONS

## A. MILITARY COMPENSATION

Total military compensation (TMC) is defined as the sum of basic pay and allowance, bonuses, tax savings, and other financial benefits.

### 1. Base Pay

Service members' compensation comprises two components: basic pay and allowances. Basic pay is determined by the service member's rank and years of service, and for enlisted personnel, the range is E1 to E9. Unlike the private sector, where employers can grant pay increases at any given point in the year, government employees must wait until the budget passes before receiving such increases.

The Defense Finance Accounting Service (DFAS) annually releases updated pay tables that reflect Congress-approved pay increases. In addition, the Department of Defense uses the Employment Cost Index (ECI) to link military pay increases to private sector wages. Since 2007, basic pay raises have ranged from 0.5% to 4.6% (DOD, n.d.a).

The promotion prospects of service members depend on several factors, including the availability of vacancies and the number of eligible personnel. In some cases, supply and demand dynamics come into play, such as in the case of Fire Controlman, who enjoy favorable promotion rates due to the difficulty in recruiting personnel with their qualifications and a high attrition rate. As a result, a Fire Controlman will likely obtain the rank of E5 before completing six years of service and possibly even E6.

### 2. Career Sea Pay

This thesis analyzes the promotion prospects of a Fire Controlman with six years of experience and holding the rank of E5. Fire Controlman receive extensive and advanced training, leading to longer 72-month enlistment contracts than the more traditional 48-month contracts (Powers, 2019). Another significant feature of the Fire Controlman rating is its sea-centric position. Therefore, it is reasonable to anticipate that service members in this occupation will receive career sea pay.

### 3. Allowance for Housing and Subsistence

#### *a. Basic Allowance for Housing*

The Basic Allowance for Housing (BAH) is calculated based on locality rates, which vary depending on the service member's duty station. For example, naval ships have seven primary locations to station Fire Controlmen: Rota, Spain; Sasebo, Japan; Pearl Harbor, Hawaii; San Diego, CA; Everett, Washington; Norfolk, VA; and Mayport, Florida. Therefore, to ensure accurate analysis, this study will use an average BAH rate based on Norfolk, VA; Mayport, Florida; and Everett, WA, to avoid overestimating the numbers due to the high cost of living in San Diego and Pearl Harbor, Hawaii. Furthermore, service members outside the continental United States (OCONUS) receive the additional cost of living allowances, which could further impact the numbers.

#### *b. Basic Allowance for Subsistence*

All service members receive a Basic Allowance for Subsistence (BAS). This non-taxable monthly allowance covers the expenses associated with meals. It is important to note that the BAS remains constant regardless of an individual's pay grade or dependency status (DOD, n.d.a). Although sea-duty sailors are eligible for this allowance, it is automatically deducted from their pay since meals are available daily. On average, Basic Allowance for Subsistence (BAS) has increased by 2.09% over the past decade. However, as shown in Table 1, some years have had no increases, while others have experienced significant jumps.

Table 1. Basic Allowance for Subsistence (BAS) Rates. Source: Veterans.com

| Year | Proposed Increase | Actual Increase | Enlisted Rate |
|---|---|---|---|
| 2012 | 3.40% | 7.20% | $348.44 |
| 2013 | 3.40% | 1.09% | $352.27 |
| 2014 | 3.40% | 1.48% | $357.55 |
| 2015 | 3.40% | 2.90% | $367.92 |
| 2016 | 3.40% | 0.10% | $368.29 |
| 2017 | 3.40% | 0% | $368.29 |
| 2018 | 3.40% | 0.30% | $369.39 |
| 2019 | 3.40% | 0% | $369.39 |
| 2020 | 2.40% | 0.90% | $372.71 |
| 2021 | 3.30% | 3.70% | $386.50 |
| 2022 | 5.30% | 5.30% | $406.98 |

### 4. Tax Savings

This thesis excludes state taxes since some states grant tax exemptions to active duty service members. This is because not all service members live in their state of residency. From an individual's perspective, this approach is beneficial. However, from a societal standpoint, there is a potential loss of tax revenue, which is an important distinction to consider. For example, if a service member enlists in the Navy and is stationed in California but is a resident of Illinois, they are not obligated to pay California taxes. However, they are also not required to pay Illinois taxes because they do not live in Illinois. Moreover, state income taxes range from 0% to 12.47%; nine states, including Alaska, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming, do not have an income tax (Archie, 2023).

Allowances are another form of income that is tax-exempt for service members. For instance, an E5's combined Basic Allowance for Housing (BAH) and Basic Allowance for Subsistence (BAS) annual earnings would amount to $25,395. Using the standard 15% tax rate, the service member could save $3,809 in taxes.

#### 5. Bonuses

The Navy employs reenlistment bonuses as an effective tool for retaining its most talented personnel. These bonuses incentivize sailors to continue their military service, with the bonus amount tied to the time the service member decides to commit. In 2017, the maximum authorized bonus for a FCA was $75,000. The bonus calculation involves multiplying the service member's basic military pay by the duration, in months, of their reenlistment contract as specified in naval message 311/17 (Navy Personnel Command, 2017).

The study conducted by Asch et al. in 2010 investigated the connection between retention and reenlistment bonuses, and the researchers discovered that abolishing the reenlistment bonuses program in 2007 would have significantly reduced the likelihood of reenlistment in the Army, dropping from 39 percent to 35 percent. This demonstrates the importance of the bonus program in helping the Army meet its retention objectives in 2007. The study also revealed that the impact of bonuses on reenlistment was comparable for the Navy but varied for the Marine Corps and Air Force.

### B. CIVILIAN COMPENSATION

#### 1. HEALTH CARE COST

While active duty service members receive no-cost health care benefits through the DOD's Tricare health insurance program, civilians must pay for their health insurance. For example, in 2017, the average annual health insurance worker contribution for family coverage was $5,714 (Kaiser Family Foundation, 2017). Some analysts exclude this factor from their examination, citing the wide variety of healthcare options available to individuals, making comparisons difficult. However, it is crucial to consider the cost of healthcare, as many service members considering leaving active duty for the civilian sector

want to ensure continuity and financial stability for their families. Therefore, I believe that the cost of healthcare should be included in any computation as it is a vital component of the decision-making process.

Military members can access charts and tables that display their pay increases. On the other hand, calculating civilian pay increases is more challenging due to making certain assumptions. These assumptions include staying in the same job at the same company and earning the same wages, including any industry standard pay increases.

### 2. CIVILIAN PAY INCREASE

> Average hourly earnings for all employees increased 2.5 percent, and average weekly earnings were up 2.5 percent over the year ended May 2017. The Consumer Price Index for All Urban Consumers, which is used to adjust earnings estimates for inflation, increased 1.9 percent over the year. After adjusting for inflation, real average hourly earnings increased 0.6 percent from May 2016 to May 2017. This increase in real average hourly earnings, combined with no change in the average workweek, resulted in a 0.6-percent increase in real average weekly earnings over this period (BLS, 2017).

This analysis incorporated a steady annual increase of 0.6 percent in civilian pay over a period of six years. This analysis focuses solely on the impact of a 0.6 percent increase in civilian income over six years, excluding other factors such as job experience, education, and location, as their significant variability can complicate the analysis.

Figures 4–6 highlight the significant variations in average annual salaries of computer network support specialists, network and computer systems administrators, and computer network architects across different states, showcasing the impact of location on pay. Additionally, these figures compare these salaries with the total military compensation of an FCA ($83,484.00), demonstrating the contrast between civilian and military pay in different geographical areas.

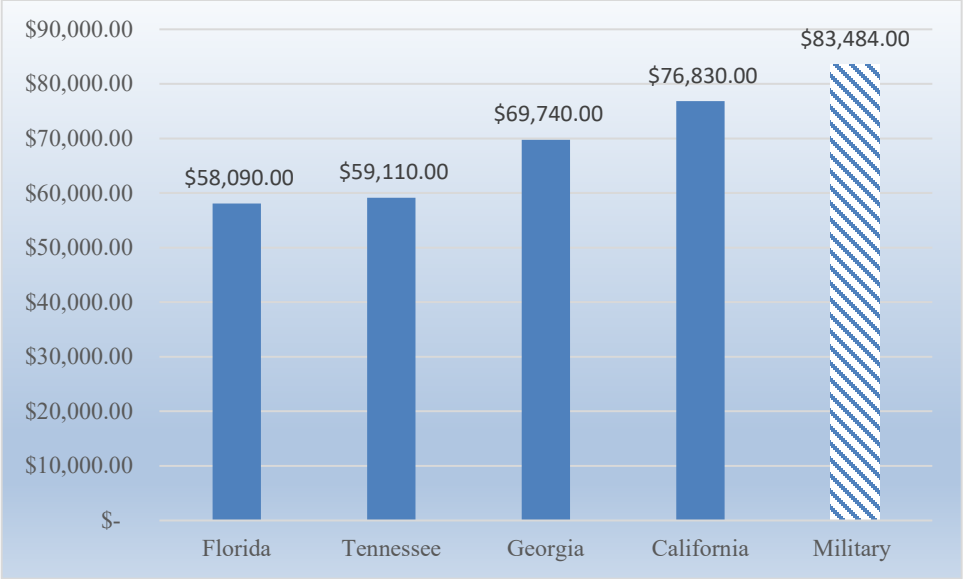


Figure 4. Computer network support specialist annual salary. Source: BLS (2017).

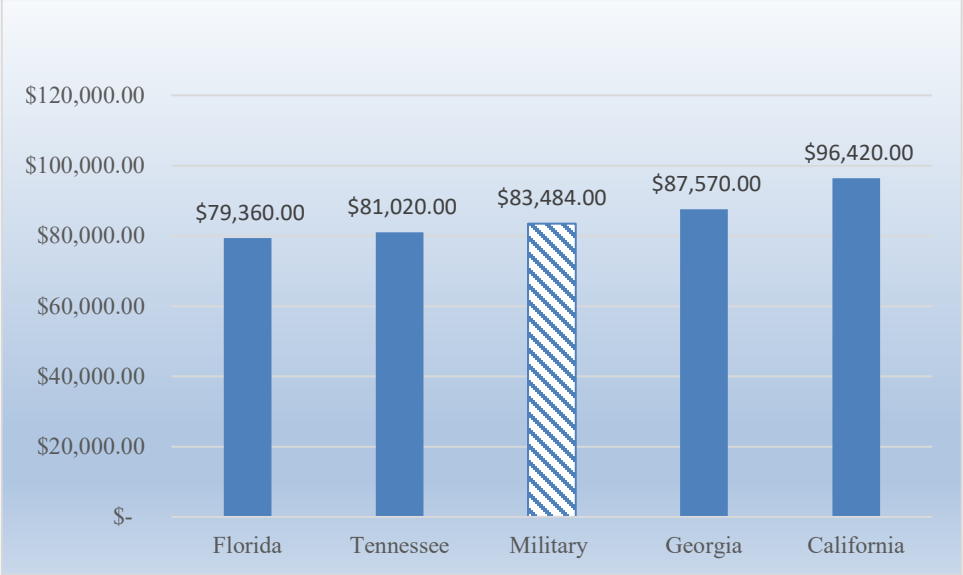


Figure 5. Network and computer systems administrator annual salary. Source: BLS (2017).

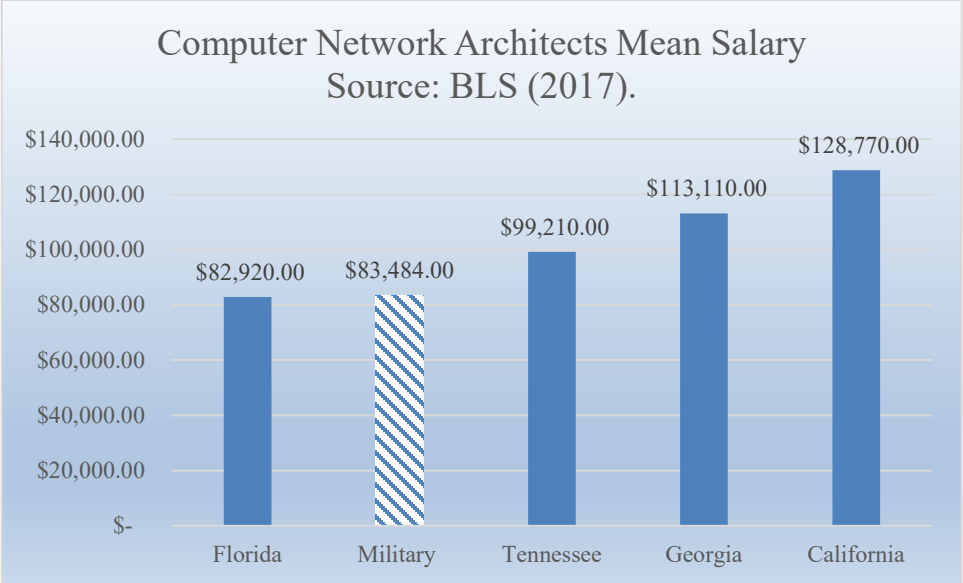


Figure 6. Computer network architect annual salary. Source: BLS (2017).

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# IV. CALCULATIONS

This research utilized 2017 DFAS data to calculate the military pay of an E5 with six years of service who reenlisted and received an SRB. Their TMC is $83,484. This calculation derives from base pay, BAS, BAH, tax savings, and SRB allotment. Disbursement of reenlistment bonuses is in installments, with the maximum bonus of $75,000 being paid out in a $20,000 initial payment, followed by $11,000 annually until the total amount is received. The calculation omits career sea pay in the first three years because this allotment ends when the service member reaches the end of their initial contract as they transition to shore duty. After year 3, the calculations resume, including career sea pay.

According to 2017, pay data from the BLS, computer network architects, network and computer systems administrators, and computer network support specialists had reported median annual earnings of $104,650.00, $81,100.00, and $62,340.00, respectively. However, to calculate the actual take-home pay, we consider a yearly health insurance worker contribution of $5,714 for family coverage (Kaiser Family Foundation, 2017). As seen in Figure 7, his deduction results in an expected cash flow of $98,936.00, $75,386.00, and $56,626.00 for year 1, respectively. In addition, Figure 8 demonstrates the net present value (NPV) of military and comparable civilian compensation, highlighting their relative values.

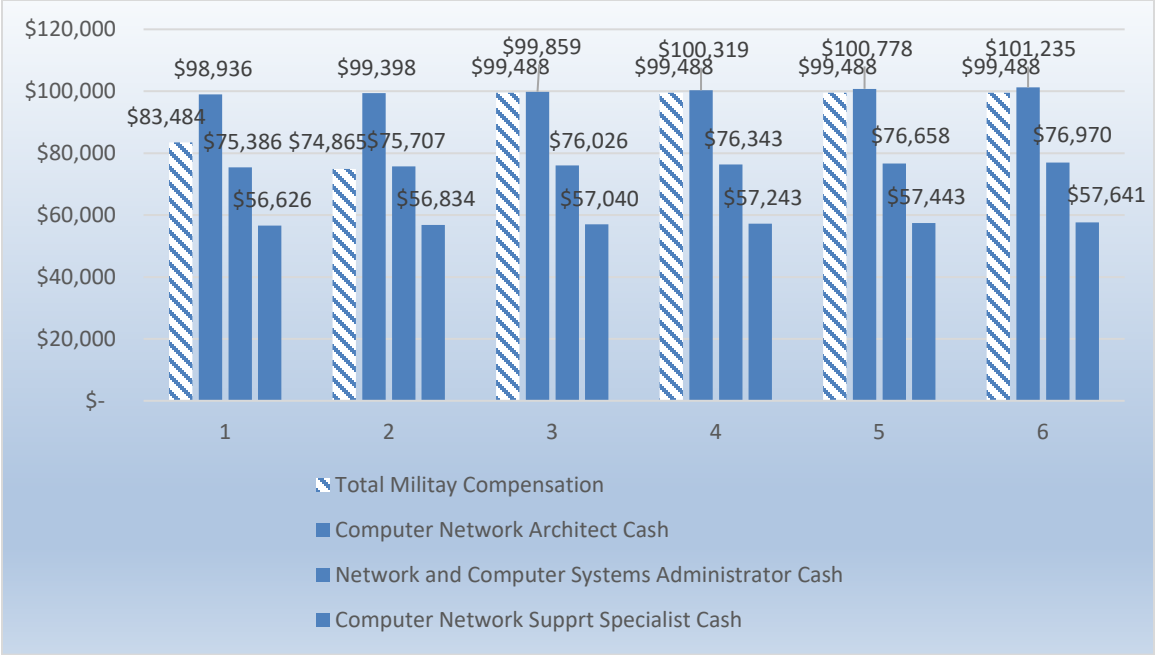


Figure 7. Military and comparable civilian compensation. Source: BLS (2017).

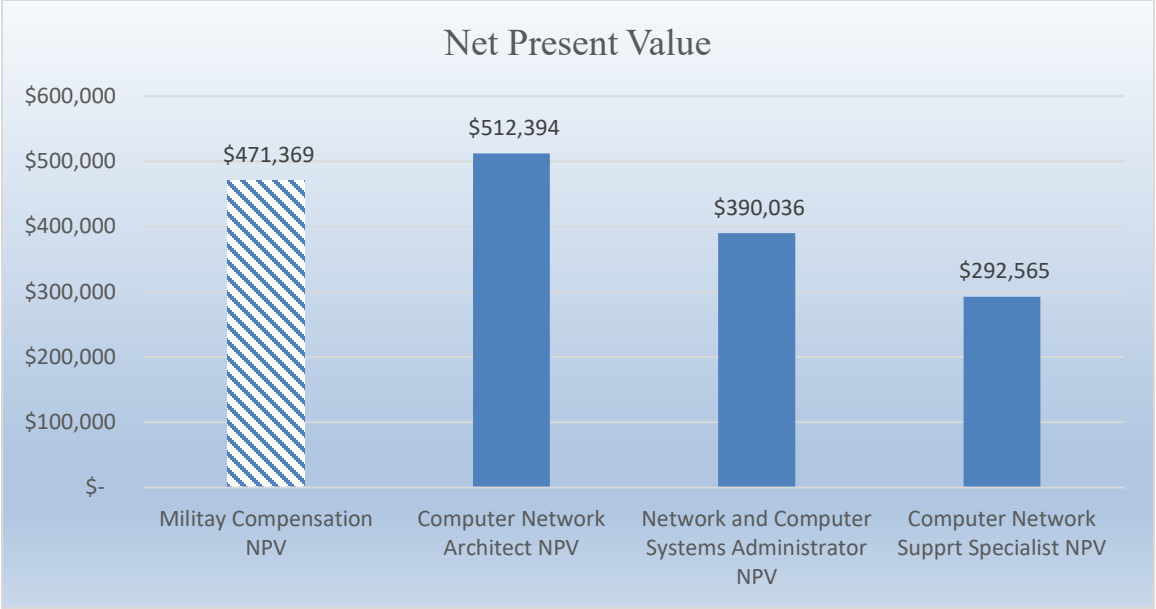


Figure 8. Net present value military and comparable civilian compensation. Source: BLS (2017).

## A. NPV EQUATION

NPV enables us to move beyond simply evaluating the immediate worth of remaining in the military or leaving, as it offers a systematic approach for assessing the present value associated with various alternatives. The calculation of NPV involves discounting "future cash flows to their present value using a chosen discount rate" (circular, A-94, P. 8). The general formula for NPV calculation is as follows: $NPV = \Sigma [CF_t / (1 + r)_t] - \text{Initial Investment}$.

## B. REAL DISCOUNT RATE

The selection of a discount rate in NPV calculations holds significant importance as it accurately captures the time value of money. In this analysis, we employ a 5% discount rate to justify the assumption that the "long-term rates of treasury bills" represent a risk-free rate (Hodges, 2015, p. 27). By incorporating these widely accepted risk-free rates, we effectively account for the minimal risk associated with investments in government securities, recognizing their inherent safety.

> A real discount rate that has been adjusted to eliminate the effect of expected inflation should be used to discount constant-dollar or real benefits and costs. A real discount rate can be approximated by subtracting expected inflation from a nominal interest rate (Circular A-94, P. 8).

## C. PERSONAL DISCOUNT RATE

This study revolves around the concept of individual decision-making. Hence, personal discount rates, which represent the "rate at which individuals are willing to trade future for current consumption" (Cunha & Menichini, 2014, p. 3), play a crucial role in the calculations. Sensitivity analysis was implemented in this thesis to effectively capture the individual's perspective. During their investigation of military retirement compensation, Cunha and Menichini (2014) made an interesting discovery: the "military force as a whole demonstrates personal discount rates of approximately 9 percent (10.05 percent for enlisted members and 6.49 percent for officers)" (p. 22). The sensitivity analysis shows the NPV of different professions under varying discount rates. In this analysis, different discount rates were evaluated, ranging from 0.02 (2%) to 0.30 (30%).

Military: For the military profession, as the discount rate increases from 0.02 to 0.30, the NPV gradually decreases. This suggests that higher discount rates reduce the present value of future cash flows associated with military roles. At a discount rate of 0.0200, the NPV is $519,553.49, and it gradually decreases to $255,305.89 at a discount rate of 0.3000.

Computer Network Architects: Similarly, for computer network architects, the NPV decreases as the discount rate increases. At a discount rate of 0.0200, the NPV is $562,425.66, and it decreases to $286,444.72 at a discount rate of 0.3000.

Network and Computer Systems Administrator: The NPV for network and computer systems administrators also follows the same pattern. As the discount rate increases, the NPV decreases. At a discount rate of 0.0200, the NPV is $428,101.84, and it decreases to $218,109.76 at a discount rate of 0.3000.

Computer Network Support Specialists: For computer network support specialists, the NPV exhibits the same trend as the discount rate increases. At a discount rate of 0.0200, the NPV is $321,099.09, and it decreases to $163,673.93 at a discount rate of 0.3000.

Overall, the sensitivity analysis shows that higher discount rates lead to lower NPV values for each profession, indicating that the present value of future cash flows is reduced when the discount rate increases. This analysis helps in assessing the financial viability and sensitivity of the professions to changes in the discount rate.

## D. NOMINAL DISCOUNT RATE

This analysis applied a steady annual increase of 0.6 percent to civilian pay, military base pay, BAH, and BAS over a six-year period. However, it is important to note we did not include career sea pay and SRB in the adjustment calculations. This is because career sea pay and SRB are generally fixed and do not typically change throughout the six years under consideration. In addition, while we did not adjust career sea pay for inflation, it is essential to note that other compensation components, such as base pay, allowances, and benefits, may undergo regular reviews and adjustments to account for changes in the cost of living or other factors. The Navy strives to ensure fair and competitive compensation

packages for its personnel while maintaining fiscal responsibility and operational effectiveness.

> A nominal discount rate that reflects expected inflation should be used to discount nominal benefits and costs. Market interest rates are nominal interest rates in this sense (Circular A-94, P. 8).

## E. MEDICAL CARE INFLATION

This analysis incorporated a nominal rate of 2.9% increase over a specified period to emphasize the trend of medical care inflation surpassing general inflation. Additionally, this analysis employed this approach to capture the sustained growth in medical care costs and underline their relatively higher inflation rate than other sectors.

> Medical Care Inflation has outpaced inflation for most items over a long time period. Medical care inflation consists of four components: Medical care commodities, Medical care services, Hospital and related services, and Health insurance. Medical care services increased 8.5% from January 2017 to June 2020, an annual rate of 2.4%. Over the past decade, Medical care services increased 32.8%, an average annual rate of 2.9% (RAND, 2023)

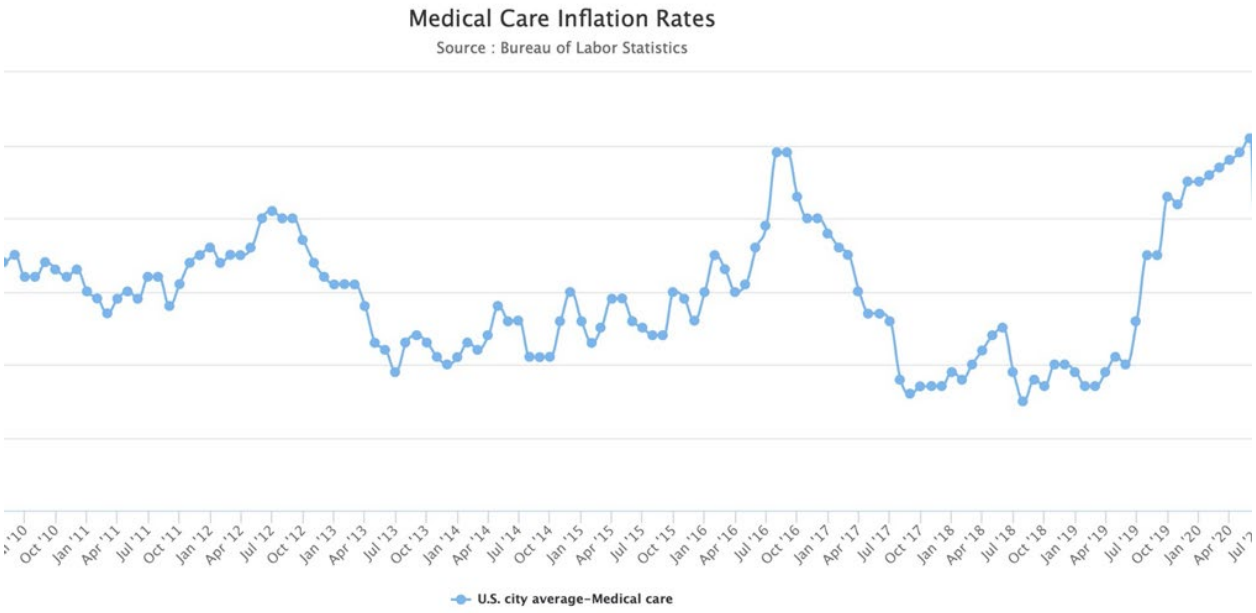


Figure 9. Medical care inflation rates, June 2010–June 2020. Source: RAND (2023).

Table 2. Sample Pay Chart. Adapted from DFAS (2017).

| Military FCA pay breakdown | |
|---|---|
| Base Pay | $34,279.20 |
| Career Sea Pay | |
| Bas | $4,419.48 |
| Bah | $20,976.00 |
| Tax saving (15% on allowances) | $3,809.32 |
| Bonus payment | $20,000.00 |
| **TMC** | $83,484.00 |

Table 3. Comparable Civilian Pay. Adapted from BLS (2017).

| | Computer Network Architects | Network and Computer Systems Administrator | Computer Network Support Specialists |
|---|---|---|---|
| Annual pay | $104,650.00 | $81,100.00 | $62,340.00 |
| Health care cost | $ (5,714.00) | $ (5,714.00) | $ (5,714.00) |
| Cash | $98,936.00 | $75,386.00 | $56,626.00 |

# V. CONCLUSION

In conclusion, the net present value of reenlisting is higher for two of the three comparable civilian occupations that the FCA may consider. As depicted in Table 2, the total military compensation without a bonus payment amounts to $63,484 per year. At first glance, this figure may make civilian pay options of $80,000 to $100,000 seem more appealing than remaining in the military. However, since the SRB has remained unchanged for over a decade, one may assume that the value of this bonus does not offer a substantial financial advantage to compete with civilian job opportunities.

This analysis compared the military compensation NPV of $471,369 with three other options. It revealed that the military NPV is 8.70% less than the NPV of a computer network architect, which is $512,394. However, in comparison to a network and computer systems administrator, the military NPV exceeds it by 23.88%, with a value of $390,036. Similarly, when compared to a computer network support specialist, the military NPV shows a 24.99% higher value, amounting to $292,565. These findings emphasize the significant variations in compensation levels within the computer and network field, with military compensation presenting both lower and higher values when compared to these specific professions.

## A. RECOMMENDATION

Contrary to initial assumptions, this analysis reveals that the steady state of the SRB does offer a significant amount when considering the adjustments made to base pay and allowances. Thus, the SRB does provide a competitive edge against civilian wages in terms of overall compensation. Furthermore, obtaining a substantial portion of the bonus payment in the first year adds value, making it even more advantageous.

Sailors should strongly consider staying in the military if they are contemplating leaving solely for financial reasons, as staying offers additional benefits beyond monetary considerations. The analysis uncovers notable disparities in compensation levels between the military and other professions within the computer and network field.

## B. ALTERNATE STUDY

Despite the financial incentive provided by the $75,000 bonus, sailors may prioritize other factors over monetary considerations when deciding to continue serving on active duty. These factors could include the desire to avoid duty assignments, deployments, or relocations that could disrupt their families' stability. In addition, the stability of having a job in the civilian sector, even if it comes with a lower income than the military, may hold significant value for them. Hence, more than the financial incentive is needed to sway their choice, and they may choose to transition to the civilian sector.

The DOD should initiate an assessment to identify potential gaps in financial literacy among sailors and their leadership, as these gaps could impact the effective communication of differences between military and civilian pay. Additionally, further research should delve into non-monetary factors that influence sailors' decisions to leave military service. This comprehensive approach will enable a better understanding of the challenges faced and aid in developing strategies to address them.

Table 4. AEF/ATF ASVAB Score.
Adapted from Department of the Navy (2022).

| **Rating/ School** | **ASVAB Test Score Qualifications** |
|---|---|
| **AEF-AECF**<br>Advanced Electronics Field – Advanced Electronics Computer Field (SN) | AR+MK+EI+GS=222 or<br>AR+2MK+GS>=230 |

Table 5. Selective Reenlistment Bonus (SRB). Adapted from the Department of the Navy (2017).

| 75,000 DOLLAR AWARD CEILING | | | |
|---|---|---|---|
| RATING NEC | ZONE A | ZONE B | ZONE C |
| FC AEGIS 0000 | * | 3 | 0 |
| | | | |
| 60,000 DOLLAR AWARD CEILING | | | |
| RATING NEC | ZONE A | ZONE B | ZONE C |
| FC AEGIS 0000 | 3 | * | 0 |

This analysis utilized a maximum potential expected cash flow of $75,000. The Selective Reenlistment Bonus (SRB) is a function of base pay and the length of the reenlistment contract. Zone A, B, and C correspond to time in service.

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## APPENDIX. MILITARY AND CIVILIAN JOB TITLES

Table 6. List of AEF/ATF/NF Ratings.
Source: Department of the Navy (2022).

| **AEF** |
|---|
| Electronics Technician (ET) |
| Fire Controlman (FC) |
| Fire Controlman Aegis (FCA) |
| Cryptologic Technician Maintenance (CTM) |
| Cryptologic Technician Technical (CTT) |
| Missile Technician (MT) |
| Sonar Technician Surface (STG) |
| **ATF** |
| Naval Aircrewman (Mechanical) (AWF) |
| Naval Aircrewman (Tactical Helicopter) (AWR) |
| Naval Aircrewman (Helicopter) (AWS) |
| Naval Aircrewman (Operator) (AWO) |
| Naval Aircrewman (Avionics) (AWV) |
| Cryptologic Technician (Interpretive) (CTI) |
| Cryptologic Technician (Networks) (CTN) |
| Explosive Ordnance Disposal (EOD) |
| Interior Communications Electrician (IC) |
| Intelligence Specialist (IS) |
| Information Systems Technician (IT) and Information Systems |

| |
|---|
| Technician Submarine (ITS) |
| Navy Diver (ND) |
| Special Warfare Boat Operator (SB) |
| Special Warfare Operator (SO) |
| Search and Rescue Medical Technician (HM L00A) |
| Fleet Marine Force Reconnaissance Independent Duty Corpsman (HM L02A) |
| Medical Deep Sea Diving Technician (HM L27A) |
| **NF** |
| Electricians Mate, Nuclear power (EMN) |
| Electronics Technician, Nuclear Power (ETN) |
| Machinist Mate, Nuclear Power (MMN) |

Table 7. List of FCA Comparable Civilian Employment.
Adapted from O∗Net Online (n.d.).

| **Military Crosswalk Search Titles matching "Fire Controlman Aegis"** | |
|---|---|
| 11-3131.00 | Training and Development Managers |
| 13-1041.03 | Equal Opportunity Representatives and Officers |
| 13-1075.00 | Labor Relations Specialists |
| 15-1211.00 | Computer Systems Analysts |
| 15-1231.00 | **Computer Network Support Specialists** |
| 15-1241.00 | **Computer Network Architects** |
| 15-1244.00 | **Network and Computer Systems Administrators** |
| 15-1252.00 | Software Developers |
| 17-2061.00 | Computer Hardware Engineers |
| 17-2199.07 | Photonics Engineers |
| 17-3023.00 | Electrical and Electronic Engineering Technologists and Technicians |
| 17-3024.00 | Electro-Mechanical and Mechatronics Technologists and Technicians |
| 17-3029.08 | Photonics Technicians |
| 19-2099.01 | Remote Sensing Scientists and Technologists |
| 19-4099.03 | Remote Sensing Technicians |
| 25-1194.00 | Career/Technical Education Teachers, Postsecondary |
| 43-9021.00 | Data Entry Keyers |
| 47-2152.00 | Plumbers, Pipefitters, and Steamfitters |
| 47-3015.00 | Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters |
| 47-5032.00 | Explosives Workers, Ordnance Handling Experts, and Blasters |

| | |
|---|---|
| 49-1011.00 | First-Line Supervisors of Mechanics, Installers, and Repairers |
| 49-2011.00 | Computer, Automated Teller, and Office Machine Repairers |
| 49-2021.00 | Radio, Cellular, and Tower Equipment Installers and Repairers |
| 49-2022.00 | Telecommunications Equipment Installers and Repairers, Except Line Installers |
| 49-2093.00 | Electrical and Electronics Installers and Repairers, Transportation Equipment |
| 49-2094.00 | Electrical and Electronics Repairers, Commercial and Industrial Equipment |
| 49-9041.00 | Industrial Machinery Mechanics |
| 49-9098.00 | Helpers--Installation, Maintenance, and Repair Workers |
| 51-2023.00 | Electromechanical Equipment Assemblers |
| 55-1014.00 | Artillery and Missile Officers |
| 55-3014.00 | Artillery and Missile Crew Members |

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