



Calhoun: The NPS Institutional Archive
DSpace Repository

Theses and Dissertations

1. Thesis and Dissertation Collection, all items

2017-03

Designing a better Navy aviation retention bonus

Simerman, Peter A.

Monterey, California: Naval Postgraduate School

<http://hdl.handle.net/10945/53048>

This publication is a work of the U.S. Government as defined in Title 17, United States Code, Section 101. Copyright protection is not available for this work in the United States.

Downloaded from NPS Archive: Calhoun



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>



**NAVAL
POSTGRADUATE
SCHOOL**

MONTEREY, CALIFORNIA

THESIS

**DESIGNING A BETTER NAVY AVIATION RETENTION
BONUS**

by

Peter A. Simerman

March 2017

Thesis Advisor:
Second Reader:

Chong Wang
Noah Myung

Approved for public release. Distribution is unlimited.

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE March 2017	3. REPORT TYPE AND DATES COVERED Master's thesis		
4. TITLE AND SUBTITLE DESIGNING A BETTER NAVY AVIATION RETENTION BONUS			5. FUNDING NUMBERS	
6. AUTHOR(S) Peter A. Simerman				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB number ____N/A____.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (maximum 200 words) As personnel costs in the military spiral higher and higher, so does the level of scrutiny of military bonus programs. Each service and each community is faced with the challenge of retaining the quantity and quality of personnel it needs while not breaking faith with a force that has endured longer deployments, increased operational tempo (OPTEMPO), and a state of perpetual war since 2001. The services also value an egalitarian pay structure and must be ever vigilant of good order and discipline and morale. The current system is cumbersome and inefficient, offering the same bonus to both high performers and low performers within categories of Pilot/Naval Flight Officer (NFO) and Type/Model/ Series (T/M/S). The primary alternative that has been offered is an auction system. However, each version of the auction method has distinct drawbacks and implementation challenges. In this paper, I propose a menu-of-contracts system whereby aviators can choose between a plan that offers guaranteed payouts at a medium rate or a plan that offers low payouts initially and then high payouts when certain performance milestones are met. This will induce aviators to self-select according to their own ability levels and effectively targets high performers with high bonus levels while maintaining a sense of fairness due to the personal choice.				
14. SUBJECT TERMS Navy, aviation, retention, bonus			15. NUMBER OF PAGES 79	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release. Distribution is unlimited.

DESIGNING A BETTER NAVY AVIATION RETENTION BONUS

Peter A. Simerman
Lieutenant, United States Navy
B.S., United States Naval Academy, 2007

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
March 2017**

Approved by: Chong Wang
Thesis Advisor

Noah Myung
Second Reader

Yu-Chu Shen
Academic Associate
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

As personnel costs in the military spiral higher and higher, so does the level of scrutiny of military bonus programs. Each service and each community is faced with the challenge of retaining the quantity and quality of personnel it needs while not breaking faith with a force that has endured longer deployments, increased operational tempo (OPTEMPO), and a state of perpetual war since 2001. The services also value an egalitarian pay structure and must be ever vigilant of good order and discipline and morale. The current system is cumbersome and inefficient, offering the same bonus to both high performers and low performers within categories of Pilot/Naval Flight Officer (NFO) and Type/Model/Series (T/M/S). The primary alternative that has been offered is an auction system. However, each version of the auction method has distinct drawbacks and implementation challenges.

In this paper, I propose a menu-of-contracts system whereby aviators can choose between a plan that offers guaranteed payouts at a medium rate or a plan that offers low payouts initially and then high payouts when certain performance milestones are met. This will induce aviators to self-select according to their own ability levels and effectively targets high performers with high bonus levels while maintaining a sense of fairness due to the personal choice.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	CONTEXT.....	1
B.	STUDY SUMMARY.....	2
C.	STUDY ORGANIZATION.....	2
II.	BACKGROUND	5
A.	AVIATOR CAREER PROGRESSION.....	5
1.	Flight Training	5
2.	First Sea Tour.....	8
3.	First Shore Tour.....	8
4.	Disassociated Sea Tour	9
5.	Second Shore Tour.....	9
6.	Department Head Tour	9
B.	NON-BONUS AVIATOR COMPENSATION.....	10
1.	Base Pay	11
2.	Housing Allowance.....	12
3.	Sustenance Allowance.....	12
4.	Other Allowances	12
5.	Tax Exemption	13
6.	Retirement	13
7.	Military Services	14
8.	Civilian-Offered Discounts.....	15
9.	Fly Pay.....	15
C.	CURRENT ACCP STRUCTURE.....	16
1.	Aviation Department Head Retention Bonus.....	16
2.	Aviation Command Retention Bonus (ACRB)	19
D.	HISTORY OF THE ACCP	19
III.	LITERATURE REVIEW	23
A.	ACADEMIC LITERATURE REVIEW	23
1.	Market Signaling.....	23
2.	Menu of Contracts	24
3.	Moral Hazard and Adverse Selection	25
B.	RELATED MILITARY STUDIES	27
1.	Assessing Officer Quality	27
2.	Surface Warfare Officer Continuation Pay	29
3.	AF Pilot Retention.....	30

4.	Navy Aviation Bonus as an Auction System.....	32
IV.	PROBLEMS FACING AVIATOR RETENTION	35
V.	MENU OF CONTRACTS.....	39
A.	PROPOSED BONUS PLAN	39
B.	PLAN BREAKDOWN.....	40
1.	Early Selection of Bonus Option.....	41
2.	Six-Year Mark.....	41
3.	Stopping Payment after DH Tour	42
4.	Continuous Offer versus One-Time Offer	43
5.	Payment Pause for One-Time FOS	43
C.	EXPECTED EFFECTS.....	44
1.	Increased Retention of Highest Quality Aviators	44
2.	Increased Bonus Efficiency	44
3.	Lower Payouts to Low Performers	46
4.	Increased Motivation and Effort	47
5.	Maintenance of Equity	47
D.	POTENTIAL LIMITATIONS	48
1.	Imperfect Promotion System	48
2.	Not Targeting Undecided Bonus Takers.....	48
3.	Reinforcing “Golden Path”	49
4.	Earlier Payment for Pilots.....	50
5.	Earlier ADSO for ACRB Takers.....	50
VI.	SUMMARY, RECOMMENDATIONS, AND CONCLUSION.....	51
A.	SUMMARY	51
B.	RECOMMENDATIONS.....	51
C.	CONCLUSION	52
	APPENDIX.....	53
	LIST OF REFERENCES	57
	INITIAL DISTRIBUTION LIST	61

LIST OF FIGURES

Figure 1.	Pilot Training Progression. Source: “Naval Aviator Training” (2017).....	7
Figure 2.	NFO Training Progression. Source: “Naval Aviator Training” (2017).....	7
Figure 3.	Aviation Officer Career Progression. Source: “FY18 Community Brief” (n.d.).....	10
Figure 4.	Possible Bonus Outcomes.....	45

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	2017 Officer Monthly Base Pay. Source: “Military Pay Charts—1949 to 2017” (2017).....	11
Table 2.	ACIP Pay Chart. Source: 37 U.S. Code § 301a.....	15
Table 3.	ADHRB Total Amounts 2009–2017.	18
Table 4.	Uniform-Price Auction Example. Source: Kelso (2014).....	53
Table 5.	QUAD Auction Example. Source: Kelso (2014).....	54
Table 6.	CRAM Auction Example. Source: Kelso (2014).	55

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

ACCP	Aviation Career Continuation Pay
ACIP	Aviation Career Incentive Pay
ACP	Aviation Continuation Pay
ACRB	Aviation Command Retention Bonus
ADHRB	Aviation Department Head Retention Bonus
ADSO	Active Duty Service Obligation
AP	Aviator Pay
API	Aviation Preflight Indoctrination
ARP	Aviator Retention Pay
BAH	Basic Allowance for Housing
BAS	Basic Allowance for Sustenance
CDR	commander
CO	Commanding Officer
CRAM	Combinatorial Retention Auction Mechanism
DH	Department Head
DOD	Department of Defense
DON	Department of the Navy
DRM	Dynamic Retention Model
EP	Early Promote
FAA	Federal Aviation Administration
FITREP	fitness report
FOS	failure of selection
FRG	Fleet Replenishment Group
FRS	Fleet Replenishment Squadron
IFS	Initial Flight Screening
JO	junior officer
LCDR	lieutenant commander
LORIO	Level of Officer Retention Inventory Optimizer
LT	lieutenant
MTA	Member Trait Average

MWR	Morale Welfare and Recreation
NATOPS	Naval Air Training Operation Procedures Standardization
NFO	Naval Flight Officer
NMI	non-monetary incentive
NROTC	Navy Reserve Officer's Training Corps
OHA	Overseas Housing Allowance
OPTEMPO	operational tempo
PEP	Pilot Exchange Program
QUAD	Quality-Adjusted Discount
RAND	Research and Development
RSCUMAVG	reporting senior's cumulative average
SCRA	Servicemembers Civil Relief Act
SNA	Student Naval Aviator
SNFO	Student Naval Flight Officer
SWO	Surface Warfare Officer
SWOCP	Surface Warfare Officer Continuation Pay
T/M/S	type/model/series
TSP	Thrift Savings Plan
XO	Executive Officer

ACKNOWLEDGMENTS

I would like to thank my thesis advisor, Dr. Chong Wang, for your continued support, guidance, and insight through both “Plan A” and “Plan B” of this thesis. Your feedback was invaluable. I would also like to thank my parents, Sherrie and David, for always picking up the phone when I called needing a break from writing. I would like to thank my mother in particular, for lending me her professional expertise as an editor. She even gave me a 10% discount.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

The ideal retention bonus for the Navy aviation community retains aviators of the highest quality and in the right quantity while also motivating officers to perform at their best. It does this within the constraints of minimizing costs, maintaining morale and good order and discipline, while conforming to an often-rigid Navy promotion and advancement system. I contend that a menu-of-contracts system meets these criteria and offer it as an alternative to both the current system and the proposed auction systems.

A. CONTEXT

Across the military, personnel costs are spiraling higher and higher. Senior leaders' attempts to cope with the situation have sparked the kind of emotionally charged debate that draws media interest. Reducing personnel costs is a strategic necessity, yet leaders do not want to break faith with military personnel who have endured longer deployments, increased OPTEMPO, and a state of perpetual war since 2001. Moreover, the political consequences of voting to reduce military pay can be substantial for any elected official. As the Navy, as well as the military in general, attempts to manage these fiscal challenges, it is also faced with a pilot shortage that only promises to worsen as commercial airlines increase hiring substantially. Furthermore, with the new Navy retirement system coming online, there is decreased incentive for military personnel to remain on active duty until reaching 20 years of service. This will make short-term incentive bonuses all the more important for the Navy to retain the people it needs.

This environment has brought to the forefront the need to develop an incentive system for aviators that is able to retain the quality and quantity of aviators the Navy needs while keeping costs to a minimum. Under the current system, the Aviation Career Continuation Pay (ACCP) pays a bonus to aviators who agree to sign on for a Department Head tour. The amount of the bonus depends on whether an aviator is a pilot or Naval Flight Officer (NFO) and what type of aircraft he or she flies. The primary alternative that has been offered to this system is an auction mechanism whereby aviators bid on the amount of bonus they are willing to accept in order to stay in aviation. Those

who pick the lowest amount will be retained and promoted. Neither the current system nor the proposed alternative sufficiently takes into account the quality of the aviator.

B. STUDY SUMMARY

In this paper I will make the case for a “menu-of-contracts” bonus system and lay out the details of how such a plan could be implemented into the current Navy promotion and advancement system. The menu-of-contracts will effectively target higher bonuses to the best aviators, ensuring the retention of the quality of aviator the service needs. Aviators will be able to choose between a bonus that pays out at a guaranteed rate and one that pays out at a lower rate initially but at a higher rate once certain performance milestones are met. This will induce aviators to select the bonus that maximizes their own gain and thereby achieves a perfect separating equilibrium according to ability level. Separating individuals by performance as such will increase the efficiency with which we offer the bonus. It will prevent the Navy from offering too much bonus to low performers who will stay in anyway and too little bonus to keep the high performers the Navy wants and needs. This system will also combat any perception that the Navy is breaking faith with its aviators as the individual will be able to choose their own bonus. Other benefits will include higher quality senior leadership, which will in turn help retention. The superior efficiency of this system will retain both higher quality and a greater quantity of aviators.

I compare this menu-of-contracts system to the proposed auction systems and identify shortcomings in implementation of the auction system. The menu-of-contracts system more closely achieves the goals of the retention bonus while fitting within the current promotion and advancement system.

C. STUDY ORGANIZATION

The study is separated into six chapters that will support the change to the bonus system that I propose. The first chapter after the introduction will provide the context in which the new system must be considered. It will outline the current expected career path of a naval aviator, as well as other compensation that an aviator receives in addition to

the bonus. It then explains the current bonus system and how that system has evolved over the years.

The next chapter is a review of all relevant literature that has contributed to the development of this proposed system. This includes economic and contract theory as well as a review of similar bonus programs in the Surface Warfare community and the Air Force aviation community. It will also discuss the auction system that has been offered as an alternative to the current bonus system.

Chapter IV outlines the specific challenges facing the aviation community and the goals that the aviation bonus system seeks to accomplish. Chapter V provides the details of how this proposed bonus system could be applied to the aviation community and its expected effects including some potential drawbacks. Finally, Chapter VI presents a final summary, conclusion, and recommendations.

THIS PAGE INTENTIONALLY LEFT BLANK

II. BACKGROUND

In order to develop a more effective bonus system, it is important to first understand what the current system is and what led us to that system. This chapter discusses how the bonus fits into the expected aviator career progression, how aviators are currently compensated outside of the bonus, how the current bonus system works, and what led us to this bonus system.

A. AVIATOR CAREER PROGRESSION

The context in which ACCP bonus is administered is extremely important in understanding how to improve it. Therefore, we must understand the basic outline of an aviator's career. Given the long time needed for training and long service obligation incurred by pilots and Naval Flight Officers (NFO), the aviation community has a more uniform career progression than most communities. The first several tours are usually of the same type for all aviators. This section details the expected career progression of a Naval Aviator and the milestones he or she is expected to achieve in order to advance.

1. Flight Training

The Navy's flight training begins with all aviators completing the same training, then slowly separates pilots and NFOs and divides each group into specific platforms to focus on their own training. This process means that different timelines are required to earn the aviator's "wings of gold," as well as different timelines until an aviator arrives at an operational squadron.

a. Initial Flight Screening

The very first phase of flight training is designed to reduce attrition in further phases of flight training by identifying the Student Naval Aviators (SNAs) and Student Naval Flight Officers (SNFOs) who lack the determination, motivation, or aeronautical adaptability required to succeed (Department of the Navy [DON], 2012). This phase also is intended to introduce current and potential SNAs and SNFOs to the basics of flight training. The program sends students to civilian private pilot programs to get the very

basics of flying in 13.5–15 hours of flight (DON, 2012). Midshipmen at the Naval Academy are able start this program before they are commissioned, thus shortening the time to train after commissioning.

b. Aviation Pre-flight Indoctrination

This is the last phase of flight training that pilots and NFOs complete together. It is a ground-based school that teaches students the basics of aerodynamics, weather, engines, navigation, and flight rules and regulations. Students also complete water and land survival training, parachute training, and flight gear familiarization (Naval Aviation Schools Command [NASC], 2017).

c. Primary Flight Training

For primary flight training, SNAs and SNFOs are separated but complete much of the same training. Both are trained in basic flight maneuvers, aerobatics, and instrument navigation. SNAs are also trained in formation flying. This program lasts for approximately 12 weeks for SNFOs and 24 for SNAs (Kelso, 2014). Following this school, students may select which community they wish to join. Quotas are set by the Navy, however, and it has the final say regarding which community each student will be assigned to.

d. Further Flight Training

After primary flight training, each community breaks into its own specific training pipeline, as depicted in Figures 1 and 2.



Figure 1. Pilot Training Progression.
 Source: "Naval Aviator Training" (2017).

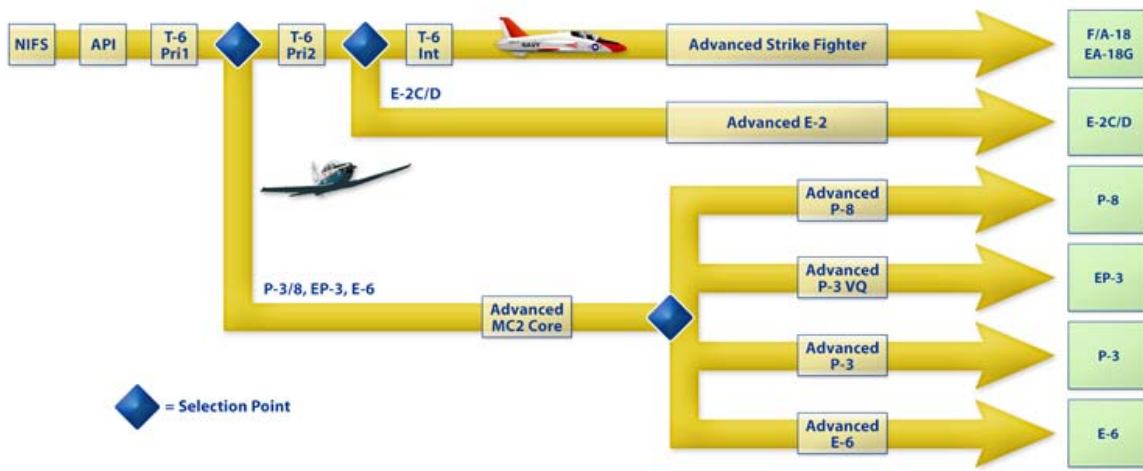


Figure 2. NFO Training Progression.
 Source: "Naval Aviator Training" (2017).

Generally, NFOs take about 12–18 months to be winged, and pilots about 18–24 months (Kelso, 2014). Winging is the point at which a SNFO or SNA becomes a fully qualified NFO or pilot. It is also the point at which an officer’s service obligation begins. Currently, pilots owe eight years from this point, and NFOs owe six.

e. Fleet Replacement Squadron

After winging, pilots and NFOs still have more training before reporting to their first operational squadron. They are assigned to their Fleet Replenishment Squadron (FRS) for final training on the specific aircraft they will fly. This can take an additional six months to a year, depending on the platform (Kelso, 2014).

2. First Sea Tour

Prior to the first sea tour, an aviator has received only “non-observed” fitness reports (FITREPs). Non-observed FITREPs do not count for or against an officer’s promotion. Officers arrive at their first squadron with essentially a blank slate in terms of evaluations. Performing well in this first tour in an operational squadron is essential to an aviator’s career success. Success in the first tour will position them well for a competitive job in their second tour, which can lead to another one in their third tour. The focus in this tour is on attaining plane-specific tactical qualifications. A desirable qualification is that of instructor pilot or instructor NFO. Additionally, certain ground jobs within the squadron, such as Naval Air Training and Operating Procedures Standardization (NATOPS) officer or Safety officer, are generally given to high performing officers. These positions can be a signal beyond FITREPs of whether an officer is expected to succeed.

3. First Shore Tour

Taking orders in which an officer can compete with many other officers as a first shore tour is essential to an aviator’s advancement. The most desirable orders for those wishing to advance in naval aviation are “production” billets, which are defined as those contributing to the support and manning of the community (Chief of Naval Personnel [CNP], 2013). These can include returning to the FRS as an instructor or participating in the test pilot program. As these billets are limited and are the best way to remain competitive for promotion, there is a screening process in place to ensure that the best officers are selected to these jobs.

Other jobs less likely to help an officer advance include participating in the Pilot Exchange Program (PEP) and flying with an allied nation's military for a tour, being company officer at the Naval Academy or a Naval Reserve Officer Training Corps (NROTC) instructor, or working on a staff. Even getting an advanced degree at an institution like the Naval Postgraduate School, something that one would think would make an officer more valuable, is seen to have an adverse effect on an officer's chances of promotion.

4. Disassociated Sea Tour

This tour, like the first shore tour, has job opportunities that enhance an officer's chances of advancement and ones that detract from it. Like the previous tour, the job to which an officer is slated depends largely on the individual's prior performance. Each community has its own jobs that it values in this tour. Often VP and Helo aviators will go to a job on an aircraft carrier. Even on the carrier, though, there are jobs that will look good to a promotion board and those that will be viewed more negatively. Other communities prefer their officers go to a carrier air wing staff, or do a "super JO" tour in which they go back to an operational squadron.

5. Second Shore Tour

Not all aviators will have a second shore tour. Because of the various times between commissioning and arriving at their first squadron, some officers do not have time for this tour before a Department Head tour. For the same reason, the length of this tour is quite variable and is often used as a holding point for officers until they can screen for O4 and Department Head. If they do screen for these positions, this tour can be cut short in order to get the officer to their Department Head tour.

6. Department Head Tour

Prior to a Department Head tour, aviators will return to the FRS to requalify if they have not been in a flying billet. They will then complete 30-month orders in a squadron as a Department Head. As Kelso points out, while in their first tour an aviator's proficiency was measured by the qualifications they received and their performance in

the aircraft; by a Department Head tour, an aviator is expected to already be proficient in his or her job in the aircraft. The factor that decides whether or not a Department Head receives a favorable FITREP lies in the officer's ability to manage the personnel below them and the squadron as a whole.

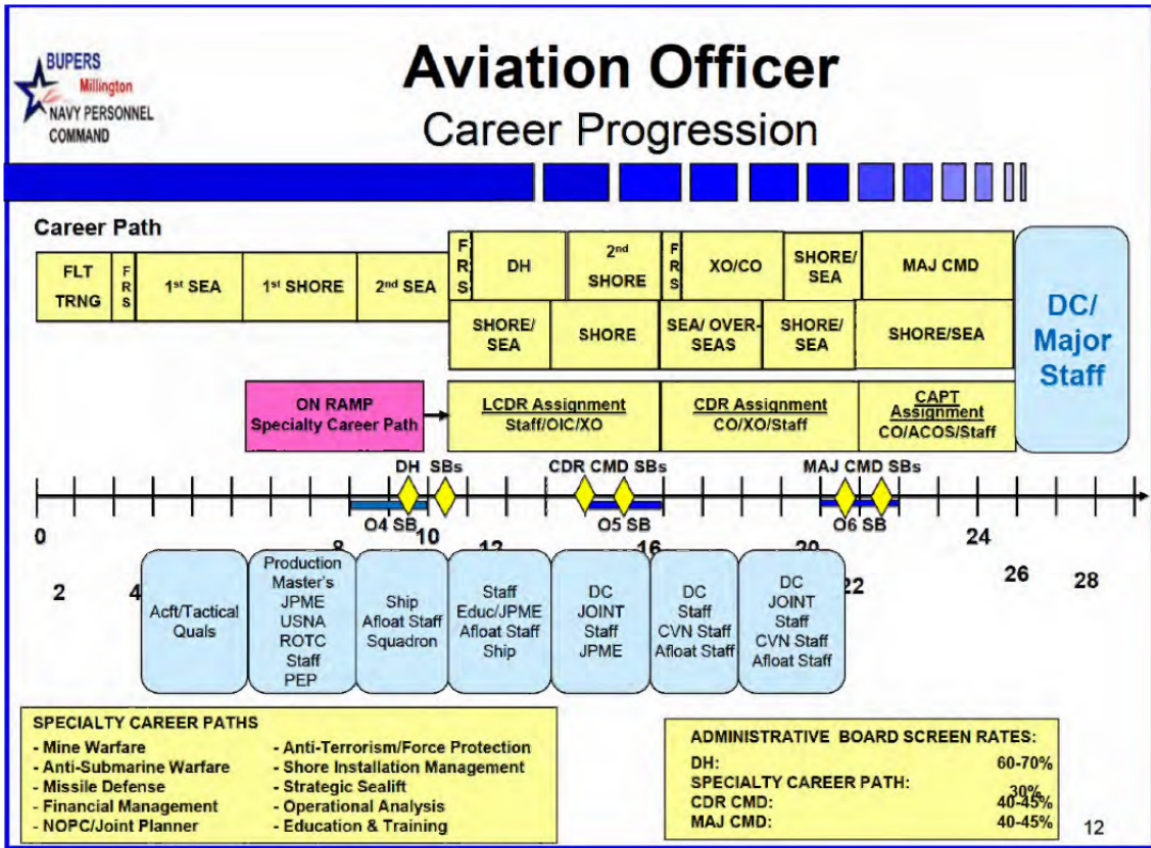


Figure 3. Aviation Officer Career Progression.
Source: "FY18 Community Brief" (n.d.).

B. NON-BONUS AVIATOR COMPENSATION

Popular media often refers to how little money the military makes and will cite the base pay tables, which are readily available online. This is usually done while making some point about how the military bears so much sacrifice for such little compensation. The truth, however, is that base pay is just a fraction of the total compensation that service members receive. The host of bonuses, allowances, and special pays make base pay sometimes only half of a service member's paycheck. In addition, there are more

intangible benefits that are not included in a member’s paycheck. To appreciate the impact a bonus will have on a service member, we must understand the total compensation package those service members are receiving without the bonus.

1. Base Pay

Military base pay is consistent across all services and is rank and time-in-service dependent. The military pay scales are readily available to all via a simple Internet search. Table 1 depicts the officer pay scales for 2017 showing monthly pay.

Table 1. 2017 Officer Monthly Base Pay. Source: “Military Pay Charts—1949 to 2017” (2017).

Pay Grade	Years of Service								
	<2	>2	>3	>4	>6	>8	>10	>12	>14
O-10									
O-9									
O-8	10,155	10,488	10,709	10,770	11,046	11,506	11,613	12,050	12,175
O-7	8,438	8,830	9,011	9,156	9,417	9,675	9,973	10,270	10,569
O-6	6,399	7,030	7,491	7,491	7,520	7,842	7,885	7,885	8,333
O-5	5,334	6,009	6,425	6,503	6,763	6,918	7,260	7,511	7,834
O-4	4,603	5,328	5,684	5,762	6,092	6,446	6,887	7,230	7,469
O-3	4,047	4,587	4,951	5,398	5,657	5,941	6,124	6,426	6,584
O-2	3,497	3,982	4,586	4,741	4,839	4,839	4,839	4,839	4,839
O-1	3,035	3,159	3,819	3,819	3,819	3,819	3,819	3,819	3,819
Pay Grade	Years of Service								
	<16	>18	>20	>22	>24	>26	>28	>30	>32
O-10			15,583	15,583	15,583	15,583	15,583	15,583	15,583
O-9			14,352	14,559	14,858	15,379	15,379	15,583	15,583
O-8	12,552	13,097	13,599	13,934	13,934	13,934	13,934	14,283	14,283
O-7	11,506	12,297	12,297	12,297	12,297	12,360	12,360	12,607	12,607
O-6	9,125	9,590	10,055	10,319	10,587	11,106	11,106	11,328	11,328
O-5	8,330	8,565	8,798	9,063	9,063	9,063	9,063	9,063	9,063
O-4	7,606	7,685	7,685	7,685	7,685	7,685	7,685	7,685	7,685
O-3	6,584	6,584	6,584	6,584	6,584	6,584	6,584	6,584	6,584
O-2	4,839	4,839	4,839	4,839	4,839	4,839	4,839	4,839	4,839
O-1	3,819	3,819	3,819	3,819	3,819	3,819	3,819	3,819	3,819

2. Housing Allowance

Basic Allowance for Housing (BAH) is usually the bulk of a service member's non-base pay monthly compensation. The purpose of BAH is to provide service members funds with which to find housing in the area of their duty station. As such, service members living in base housing, in the barracks, or on the ship, are not eligible to receive BAH. The amount of BAH depends on several factors. The primary factor is the cost of living. Service members receive more allowance if the cost of living is high in the area of their duty station. It is also rank dependent, with higher ranks receiving more allowance. Finally, a service member receives either the "with dependent" rate or "without dependent" rate but the Navy does not distinguish between number of dependents. So a married service member with no children will receive the same as a married service member with five children.

A service member living overseas will not receive BAH, but instead will get an overseas housing allowance (OHA). OHA is also rank, family, and location dependent but the primary difference is that OHA is "use it or lose it." This means that if a service member does not use the full amount of the OHA on housing, then the remainder is recouped by the Navy.

3. Sustenance Allowance

Service members receive a monthly basic allowance for sustenance (BAS) to be used for food. This allowance, like BAH, is location dependent. Unlike BAH, however, BAS is the same across all ranks and dependent situation.

4. Other Allowances

There are a number of other allowances that an officer may be paid at any given time depending on their duty and current situation. These include, but are not limited to, hazardous duty pay, imminent danger pay, flight deck pay, and family separation pay ("Special and Incentive Pays," 2014). These allowances are paid to officers and enlisted personnel based on where they are currently stationed or deployed and their required

duties. Payments stop when the service member exits the area or ceases the activity that prompted the allowance.

5. Tax Exemption

Service members receive a multitude of tax exemptions that add up to a significant amount of savings. Many of the allowances and bonuses that aviators receive are not taxable. Since these add-ons make up such a large portion of their total take home pay, many service members remain in a tax bracket in which the tax rates are relatively low. Service members who spend any portion of a month in a combat zone are exempt from federal taxes for that month. Additionally, the state of Florida does not collect income tax, and since all naval aviators go through Pensacola, Florida, for training, many aviators will make Florida their legal residence and maintain legal residence there for the remainder of their careers. This has the effect of totally exempting them from paying state income tax.

6. Retirement

The military has one of the most generous retirement plans available today. After twenty years of service, service members can retire and immediately start receiving half their base pay for the rest of their lives. For service members who remain in the military, the percentage of base pay goes up each additional year after the initial 20 years. However, should a service member leave before 20 years of service, he or she receives no retirement pay. That means that an aviator can typically be retired from the Navy at age 42 and start an entirely new career while collecting their retirement as a supplemental paycheck. This retirement plan has been particularly attractive to aviators more than members of other communities. Given the long time required to train and the subsequent long minimum service obligation, many aviators, pilots especially, are at almost ten years of service before they are able to leave the service. After having invested so much time already, and with not that much more time to go, many aviators decide to try to stay to twenty years in order to receive the retirement benefits.

The Navy has recently revamped its retirement plan as a cost saving measure and introduced a system closer to a civilian 401k plan. The new plan is referred to as a “blended” solution in that it blends the traditional Navy 20-year retirement and the

typical civilian 401k. It is set to go into effect on 01 Jan 2018 (Parrish, 2016). All current service members can choose to be grandfathered in to the old system should they so desire, but all service members entering service after 01 Jan 2018 will be under the new retirement plan (Parrish, 2016). Under the new program service members can make contributions to a Thrift Savings Plan (TSP) account that is much like a civilian 401k. The military will automatically contribute 1% of a service member's base pay into the TSP even if the service member contributes nothing (Parrish, 2016). After two years of service, the military will match the service member's contributions up to 3% of their paycheck and contribute fifty cents to the dollar for the next 2% above that for a possible total of 4% contribution by the military (Parrish, 2016). In addition, all service members will be offered a mid-career bonus equal to at least two and a half months of basic pay in return for agreeing to an additional four years of service (Parrish, 2016). For an aviator this would work out to about \$18,075 based on 2017 pay scales. The military will still offer immediate payments if a service member retires after twenty years, but those payouts will be less than they have been in the past (Parrish, 2016). The payments into the TSP will become available without tax penalties at the age of 65, much like a civilian 401k (Parrish, 2016).

There has been concern that this new retirement plan may negatively affect retention. Under the new system, service members will be able to leave the Navy with some retirement funds intact, even if they get out before twenty years, which is unlike the old system in which they got nothing. The prize at the end of 20 years, however, is significantly less. This means a much weaker incentive to stay all the way to twenty years. It is expected that most service members who plan to stay for twenty or more years will choose to remain in the old retirement system during the transition phase since the lifetime payouts are greater. The effects of these changes will not be observable for several years.

7. Military Services

There are a multitude of compensations to military personnel that are not revealed on a monthly pay stub. Among them are access to base commissaries and Morale Welfare and Recreation (MWR) facilities and activities. Commissaries are subsidized by the

military in order to offer groceries to military families at significant discounts. MWR also has gym facilities, barbers, movie theaters, recreational gear renting, and activities exclusively for military and their families.

8. Civilian-Offered Discounts

Many civilian companies will offer military discounts and services in order to show appreciation for military service. These can come in the form of discounts at the register at retail outlets, free checked baggage or seat upgrades at airports, or free meals on Veteran’s Day. Many credit cards also offer to waive annual fees on luxury credit cards which allow service members access to all the amenities and services associated with those cards. This is an expansion of the benefits and protections already offered under the Service-members Civil Relief Act (SCRA), which protects the service member from exorbitant credit debt, being evicted while on deployment, penalties for breaking leases while under military orders, and other situations (United States Department of Justice, 2015).

9. Fly Pay

Aviation Career Incentive Pay (ACIP), commonly called “fly pay,” is a monthly pay add-on designed to compensate aviators for serving in a high-risk field, and to incentivize them to stay in aviation. ACIP amounts are calculated according to years of aviation service, which includes flight training. The amounts are laid out in Table 2.

Table 2. ACIP Pay Chart. Source: 37 U.S. Code § 301a.

Years of Aviation Service	Monthly ACIP Rate
<2	\$125
>2	\$156
>3	\$188
>4	\$206
>6	\$650
>14	\$840
>22	\$585
>23	\$495
>24	\$385
>25	\$250

The large jumps in pay at 6 and 14 years coincide with major stay/leave decision points within an aviator's career. After 22 years, the pay begins to decrease as aviators transition to more of a management role and do less actual flying.

C. CURRENT ACCP STRUCTURE

Given the time and money required to train and maintain proficiency of Naval Aviators, it is essential that the Navy be able to retain the personnel in these high skilled positions. The Navy has for a long time offered bonuses in order to do this and the current program is the Aviation Career Continuation Pay (ACCP). This is commonly referred to in the Aviation community as "the bonus." It is not to be confused with ACIP, which was discussed previously. ACCP is divided into two subcategories; Aviation Department Head Retention Bonus (ADHRB), and Aviation Command Retention Bonus (ACRB), designed to incentivize Aviators to stay for their Department Head tour and a Commanding Officer's (CO) tour respectively.

1. Aviation Department Head Retention Bonus

The ADHRB is designed to incentivize aviators to complete a Department Head tour. In order to do so, officers must weather two screening processes. At 9 or 10 years of active service Aviators are reviewed for promotion to lieutenant commander (O4). Whether officers are reviewed at 9 or 10 years depends on a multitude of factors not in the control of the officer. If the officer has a "Failure of Selection" (FOS) determination they are given one more look the following year. If aviators do not promote a second time, they are separated from the Navy. After an aviator is selected to O4 they may choose to compete for orders as a Department Head. This selection board occurs in the fiscal year following their promotion to O4. This board has three looks with the first two being considered for operational Department Head and the third being considered for operational training Department Head (Chief of Naval Operations [CNO], 2015). Unlike failing to select to O4, however, an aviator may remain in the Navy and the aviation community even after two FOS's to Department Head. Of note, if officers are selected to O4 they are generally able to remain in active service long enough to reach twenty years and the retirement benefits that many desire. However, if they do not select to

Department Head, they are generally not expected to be promoted to commander (O5) if they stay in the aviation community. They may, however, be promoted if they decide to change communities.

As the ADHRB program currently stands, an aviator may sign up for the bonus a year before the date of their Active Duty Service Obligation (ADSO) (ADHRB FY17). ADSO is calculated from the date the officer is designated as an aviator or “winging.” Pilots incur an eight-year obligation upon winging, and NFOs a six-year obligation. The time from commissioning to winging is also generally shorter for an NFO, so they are able to take the bonus earlier in their careers than pilots. Upon taking the bonus, an aviator is obligated to five additional years of aviation service beginning on their ADSO or contract acceptance, whichever is later (FY17 Aviation Department Head Retention Bonus Program [ADHRB], 2017). Additionally, they are required to remain in the aviation community, to compete for Department Head orders and, if they are selected, to execute those orders. In return, the aviator is offered an equal lump-sum bonus payment each year for five years beginning at their ADSO. If aviators opt to take the bonus early, they will receive six payments starting a year before their ADSO, but their total payouts will remain the same (ADHRB, 2017). Congress has authorized up to \$25k a year for this bonus (37 U.S.C § 301b, 2016). Previously, the Navy gave the entire \$25k to both pilots and NFOs. Over time, however, the Navy has gotten more specific as to how it administers the bonus. First it was broken down so that pilots and NFOs received different bonuses. The Navy later broke it down even further into Type/Model/Series (T/M/S) of aircraft. In this context T/M/S refers to the subcommunity within aviation all members of which generally fly the same type of aircraft. For instance, VFA is the strike fighter community and all members currently fly some variant of the F/A-18. In the VP community, even though this community is currently transitioning from the P-3 Orion aircraft to the P-8 Poseidon aircraft, all members are grouped together as the VP (Patrol) community. The reason the Navy chose to become more and more specific is to avoid overpaying subcommunities that were not facing shortages. They did not want to pay VP NFOs more when really who the Navy was trying to keep were VFA pilots. The total amounts of the bonuses offered over five years for 2009–2017 are given in Table 3.

Table 3. ADHRB Total Amounts 2009–2017.

Designator	T/M/S	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY17
1310 (Pilot)	HM	\$125K	\$125K	\$50K	\$50K	\$75K	\$75K	\$75K	\$75K
	HC/HS/HSC	\$125K	\$125K	\$50K	\$75K	\$75K	\$75K	\$75K	\$75K
	HSL/HSM	\$125K	\$125K	\$50K	\$25K	\$75K	\$75K	\$75K	\$75K
	VAQ	\$125K	\$125K	\$75K	\$125K	\$125K	\$125K	\$125K	\$125K
	VAW/VRC	\$125K	\$125K	\$25K	\$50K	\$50K	\$125K	\$125K	\$125K
	VFA	\$125K	\$125K	\$125K	\$125K	\$125K	\$125K	\$125K	\$125K
	VP	\$125K	\$125K	\$50K	\$50K	\$50K	\$75K	\$75K	\$75K
	VQ(P)	\$125K	\$125K	\$50K	\$75K	\$75K	\$75K	\$75K	\$75K
1320 (NFO)	VQ(T)	\$125K	\$125K	\$25K	\$75K	\$75K	\$75K	\$75K	\$75K
	VAQ	\$125K	\$75K	\$100K	\$100K	\$100K	\$100K	\$100K	\$100K
	VAW	\$125K	\$75K	\$25K	\$50K	\$50K	\$75K	\$75K	\$75K
	VFA	\$125K	\$75K	\$50K	\$50K	\$50K	\$75K	\$75K	\$75K
	VP	\$125K	\$75K	\$50K	\$75K	\$75K	\$75K	\$75K	\$75K
	VQ(P)	\$125K	\$75K	\$50K	\$50K	\$50K	\$50K	\$75K	\$75K
VQ(T)	\$125K	\$75K	\$25K	\$50K	\$50K	\$100K	\$100K	\$75K	

In FY09 the same bonus was offered to all aviators (Pilot and NFO). In FY10 it was broken down only by Pilot vs. NFO. Subsequently, it was divided by Type/Model/Series (T/M/S). Data compiled from PERS-435 ACCP/ACIP program officer personal communication, FY-15 ADHRB Program Information, FY-16 ADHRB Program Information, and FY-17 ADHRB Program Information.

If aviators fail to select for either O4 or Department Head, the officers may keep what payments have been made, but will not receive further payments. If an aviator voluntarily leaves the Navy before his or her obligation is complete, or if they do not accept Department Head orders when offered, the officer must repay any funds already received. (FY16 ADHRB Program Information, 2016).

The Navy has allowed some flexibility in this contract. Though it is not obligated to do so, the aviation community regularly allows those who have FOSed once for O4 to transfer to a different community and retain the funds they have received. The reasoning behind this is that officers who do not make it to O4 on the first look are unlikely to make it on the second and if they do make it on the second look there is even less probability that they will then select for Department Head. So, instead of forcing these individuals to stay in aviation and likely FOS a second time and be forced out of the Navy, the aviation community allows them to transfer to a different community where they may be more likely to select to O4 and continue to be of service to the Navy. This effectively saves the Navy from forcing out officers who could still be of value in a different community. The drawback of this policy is that it could incentivize low performers to take the bonus,

knowing that they are not likely to select to O4 but giving them a way to stay in the Navy if they are able to transfer to a different community while also keeping the bonus money. This drawback is mitigated by the fact that it is often difficult to transfer to a different community after a single FOS.

2. Aviation Command Retention Bonus (ACRB)

The ACRB is set up differently than the ADHRB. The ACRB is only offered to aviators who have already applied for, been selected, and are actively serving as Commanding Officer of a squadron (FY16 Aviation Command Retention Bonus Program [ACRB], 2016). The bonus is set at \$18,000 per year, the first instalment of which is to be paid upon contract acceptance, and the second instalment a year later. The contract obligates the officer to their 21st and 22nd years of service. Should the officer apply for the bonus after their 20th year of service then the two-year obligation begins upon the application's acceptance by the Navy (ACRB, 2016). The offer expires the day the aviator relinquishes command of the squadron (ACRB, 2016).

Most officers complete their CO tour in their 19th year of service. So, assuming they accept the bonus immediately, they are being paid while they are CO for years they will pay back later. Part of the reason the bonus pays out before the obligated service kicks in is that the Navy saw it prudent to ensure that aviation Department Heads who were currently receiving their ADHRB bonus were not making more money than the CO.

D. HISTORY OF THE ACCP

The bonuses offered to aviators have taken numerous forms over the years. As Watson outlines in her work on the ACCP, the Navy relied heavily on reservists in the 1970s. She notes that the percentage of Navy pilots who were reservists reached as high as 35% from 1971–1972. Watson observed that this fell off to 13% by 1980, but it became clear that the Navy needed to do a better job of retaining its active duty aviators. According to her work, the earliest form of the bonus was the Aviation Officer Continuation Pay, which was offered from 1981–1982 and 1984–1988. That bonus program was then changed to the Aviation Continuation Pay (ACP) in 1989.

Moore and Griffis (1999) outline in their work the reasons the Navy set aside the old ACP in favor of the ACCP. According to these authors, the ACP was a DOD-wide authorization to offer a bonus of up to \$12,000 a year to aviation officers who had completed between 6 and 13 years of service and obligated them to serve through the 14th year of service. No payments were to be made to those in excess of 14 years of service. Moore and Griffis indicate that one of the problems with this program was that many takers would attrite before fulfilling their obligations. This could happen through failure to select to O4, injury, or by transferring to a different community. The latter problem was because, although the program obligated service to 14 years, it did not keep aviators from transferring to a different community. Moore and Griffis further note that the \$12,000 maximum bonus level was worth significantly less in 1999 than at its inception in 1989 and that the bonus level needed to change in order to keep up with inflation and continue to be an effective incentive.

Finally, in fiscal year 2000, the DOD incorporated the ACCP, which is the current system. However, the bonus is adjusted yearly not only in amount but also in the details of how it is paid out, when aviators are eligible, and what their obligations are. While these adjustments are relatively minor, they can affect bonus take-rates. An internal memo outlining the history of the ACCP obtained from a program officer with PERS 435 states that at the inception of the ACCP, the bonus maximum was raised from \$12,000 a year to \$25,000 a year DOD-wide (personal communication, November 4, 2016). ACCP was also extended to offer the bonus up to 25 years of service. The Navy used this new program to specifically target aviators to not just stay in the aviation community but to take sea duty and command billets. Initially the ACCP offered two- to three-year contracts of up to \$15,000, and it was offered only to those assigned to sea duty (personal communication, November 4, 2016). The memo notes that this did not address the issue of retaining Junior Officers past their minimum service obligation, as many reached that point while on shore duty. Per the memo, the program was modified mid-year to also allow five-year contracts for which pilots were paid \$25,000 a year and NFOs \$15,000. Those taking the five-year contracts were offered half of the sum upfront (personal communication, November 4, 2016).

The 2001 bonus was similar to the modified 2000 bonus with the exception that aviators under contract in the previous ACP contract were offered three-year contracts at the new bonus levels in order to provide an equitable transition from one system to the other (personal communication, November 4, 2016).

The major amendment made to the program in 2002 was to offer the bonus a year prior to the end of an aviator's ADSO. This allowed an aviator to receive the bonus incentive at a time that they were making the critical stay or leave decision (personal communication, November 4, 2016). This program was continued in 2003.

The adjustment in 2004 was that the lump sum payment was held until the aviator was successfully screened for Department Head. Until that occurred, they were paid annual instalments (personal communication, November 4, 2016). This saved the Navy from paying large sums to those who would eventually not fulfill their entire obligation. Additionally, it payed less to the low-type officers who were the ones that failed to screen for Department Head.

In 2005, the three-year option was eliminated to ensure that aviators who took a bonus would stay through their Department Head screen board. On top of this, the Navy stopped payment of the contract if the aviator failed to screen for Department Head according to the memo on the history of the ACCP. In this sense, this was really the first year that the bonus became specifically a Department Head bonus, as opposed to a general retention bonus. With this change, the only bonus available would obligate officers to try to screen for Department Head. If those officers were not selected, bonus payments would stop.

The next major change came in 2011 when the Navy began varying bonus amounts based on Type/Model/Series (T/M/S) (personal communication, November 4, 2016). This had the net effect of reducing most bonus levels due to excess retention while maintaining bonus levels in critical platforms. Additionally, lump sum payments were removed from the contract in favor of equal annual payments (personal communication, November 4, 2016).

In 2014, after several years of fluctuating bonus levels for each community, the Navy introduced a “rate lock” system (personal communication, November 4, 2016). Under this system if officers were to take the bonus one year and the bonus level changed the next year, they would receive the higher of the two bonus levels. This cut down on “buyer’s remorse” and prevented aviators from avoiding signing the contract in hopes the bonus level would go up the following year.

The 2015 contract changed slightly how the bonus is paid out. For aviators whose ADSO is in FY15, the payout begins not earlier than the ADSO in five equal instalments. For those with an ADSO in FY16, they can receive the money earlier and receive six equal payments starting not earlier than one year prior to their ADSO (FY15 ADHRB Program Information, 2015).

The Navy continues to learn from past experiences and to adjust the bonus to current retention and economic situations. It is difficult to identify the exact effects of each change in the bonus as they are adjusted yearly and thus it is impossible to separate what effect the bonus had on retention versus what are just year effects. If the bonus changed its structure and retention went up, it could be because of the change in structure or it could be that the economy was worse that year, which made people want to stay in the Navy, or an event happened that sparked feelings of patriotism, or countless other factors that could be the real reason for the increase in retention.

III. LITERATURE REVIEW

As the military has tried to grapple with rapidly escalating personnel costs, many studies have been undertaken to determine how to keep the necessary personnel while keeping costs to a minimum. Studies have investigated bonuses similar to the ACCP; these include the Air Force’s Aviator Retention Pay (ARP) and the Surface Navy’s Surface Warfare Office Continuation Pay (SWOCP). Studies on market forces and civilian compensation structures can also help to guide the Navy’s use of retention bonuses. Each have approached the problem from a different angle and the intent here is to build upon their work as well as use literature on economic theory and civilian contracts to build a new bonus system.

A. ACADEMIC LITERATURE REVIEW

1. Market Signaling

In his seminal work, “Job Market Signaling,” Michael Spence describes hiring as a decision made under uncertainty. An employer does not know the value of the potential employee prior to making the decision to hire them. They must therefore rely on certain “signals” that the employee will send regarding their productive capabilities (Spence, 1973). To illustrate, Spence uses education as an example. If a job applicant has an education, it will signal to the employer that he or she will be a better employee because it is only cost effective for high-type (more capable) people to get an education. This is because it costs high-type workers less time, effort, and often money (scholarships) to obtain an education. However, if education was at no cost to the potential employee—in terms of time, money, and effort—then everyone would get an education and education would lose its signaling effects. The reason that education is an effective signal to employers is that it costs high-type employees less time, money, and effort to get an education than it costs low-type (less capable) employees. It is too costly for low-type employees to mimic the behavior of high-type employees by getting an education, and therefore it signals to the employer that person’s type because of the lack of education. Applicants, therefore, *self-select* into two categories: those that get an education and

those that do not, based on the relative cost to the individual. This is how high-type applicants signal to the potential employer that they are productive workers (Spence, 1973).

In this paper, this theory is applied to the bonus system and a structure is devised whereby bonus takers self-select themselves into the appropriate category of their quality, thereby signaling to the Navy how much bonus should be paid to them. They will select the bonus structure that maximizes their own outcome and signals to the Navy their relative value. This will prevent the Navy from having to determine whom to offer a large bonus and whom to offer a smaller bonus. Allowing officers to choose for themselves what bonus they receive will also avoid any perceived unfairness on the part of the Navy and any decline in morale associated with it.

2. Menu of Contracts

In his work, “Bargaining over a Menu of Wage Contracts,” Wang investigates how employers and potential employees bargain over two dimensions: quality and wage. In this scenario the worker has private information about his type, whether he is a high-type worker or low-type worker. Wang assumes that the employer can make an offer and the worker can either accept or reject it. This is the same scenario as the current Navy bonus program; the Navy offers a bonus, and any individual officer can accept it or reject it. When bargaining over a single dimension, say price, the uninformed party has a single mechanism to induce separation: time. An employer can make an offer that is accepted or rejected. If it is rejected, another offer can be made. This continues until the offer is accepted or the employer is not willing to increase the wage any further. Real world constraints prevent the Navy from being able to negotiate in this manner and thus it is unable to achieve maximum efficiency because it can make just a single bonus offer. However, Wang finds that when bargaining over multiple dimensions, the employer can use a menu of contracts to induce the informed party to self-select into the appropriate category of high-type or low-type.

Applied to the Navy, the two dimensions the Navy is bargaining over are quality and price. The Navy wants to retain the highest quality officers while paying the right

bonus amount. Wang finds that instead of requiring multiple steps and having the uninformed party (Navy) at a distinct disadvantage, when a menu of contracts is offered only a single step is required. The informed party immediately separates him or herself according to type of worker (Wang, 1998). This maximizes the officer's own benefit as well as the Navy's.

Kuhn and Yockey delve more specifically into what scenarios make people more likely to favor a lower paying, guaranteed salary with potential for more earnings based on performance, over a flat-rate salary. They found that people were not risk averse and often preferred the lower guaranteed salary with performance-based incentives (Kuhn et al., 2003). However, some stipulations had to be met to make people more likely to prefer the riskier option. The situations in which people were most likely to favor such an arrangement included where their incentives were based on personal performance, as opposed to team or company performance. People wanted their compensation to be in their own hands and were more optimistic about receiving incentives when it was (Kuhn et al., 2003.) This fits well with the Navy where FITREPs, billet selection, and promotions are all based on individual performance and measured as such. In this sense, a menu-of-contracts system would be welcomed by aviation officers.

3. Moral Hazard and Adverse Selection

In the insurance industry, insurers try to charge the correct amount for insurance based upon how risky they believe an individual to be. Were they to offer the same price to all applicants, the insurer would lose money on risky individuals because they would have to pay out more often. They would also fail to attract low-risk individuals because it is not worth it to these individuals to pay the high price of insurance when their risk is low. By the same token, the Navy must offer the bonus based on the quality of the individual. This is based on the assumption that high-quality individuals have more opportunities in the civilian job market and are therefore more likely to leave the Navy than low-quality individuals. If the Navy offers one bonus, then low-quality individuals will benefit because they are being paid more money than it takes to convince them to

remain in the service. It will also fail to convince high-quality individuals to stay, because they are not being paid what is necessary to keep them.

Many parallels can be drawn between the decision of how much bonus to offer an individual officer and the decision by an insurance company concerning the amount of insurance to offer an individual or company. Both decisions have elements of moral hazard and adverse selection. According to Chassagnon and Chiappori, adverse selection refers to contracts in which one party has information that the other party does not. In the insurance industry framework, in which Chassagnon and Chiappori work, that refers to the insured individual, who has information on how risky he or she is, which is information that the insurer does not have. Applied to the aviation bonus, this would be the individual aviator who knows his own quality and capabilities better than the Navy does. Moral hazard, according to Chassagnon and Chiappori, refers to a situation in which the outcome depends on a decision by one party that the other party cannot observe. The authors give the example that an insured entity can decide to incur a cost (i.e., increased training to reduce accidents at a manufacturing plant) that reduces their risk. If only partially insured, the insured company may be willing to incur this cost because there is a penalty to them should they suffer an accident. They have to pay for some of the cost of that accident. On the other hand, if that entity is insured totally, they have no incentive to incur the cost of reducing their risk because they are compensated fully for any costs of an accident. The insurer cannot observe the specific actions that an insured entity will take that will affect how risky they are, so they cannot reward those actions specifically, but they can still incentivize that entity to take those actions by making it in both the insurer and insured's best interests. Applied to the Navy aviation community, this refers to the amount of effort expended by an individual officer, which is a cost to him or her. That officer may choose to put forth maximum effort if there is the expectation of a reward. However, if the officer can expect the same retention bonus whether they perform well or not, there is no incentive to put forth that effort. Just as the insurer wants to incentivize the insured to invest in measures to become less risky, the Navy wants to incentivize aviators to invest their effort into becoming high performers with the understanding that both parties benefit from it.

Chassagnon and Chiappori conclude that separating equilibrium can be achieved through different equilibrium contracts. Separating equilibrium means that high-risk individuals will be separated from low-risk individuals so that the insurer can apply the correct insurance policy. For the Navy, this means separating high performers from low performers and offering them the appropriate bonus. Through the offering of separate contracts this can be accomplished.

They also draw a direct correlation between a high deductible and lower riskiness. This means that risk is not static. If proper incentives are applied, individuals will adjust their own level of risk. This coincides with level of effort on the part of a Navy aviator. If the aviator stands to lose more, should he not select to Department Head, then he or she will be incentivized to incur the cost of additional effort in order to prevent that situation. Simply put, if there is a difference in pay between making Department Head and not making it, then an aviator will try harder to be selected to Department Head.

B. RELATED MILITARY STUDIES

1. Assessing Officer Quality

In order to determine if the Navy is keeping high quality officers, we must determine how to measure officer quality. The obvious solution is to look at officer fitness reports (FITREPs). FITREPs are conducted once a year at minimum, also any time a Commanding Officer (CO) rotates, and when the individual service member rotates. In the aviation community, COs “fleet up,” that is, first they are the Executive Officer (XO) or second in command, and then they flow into the role of CO. So for each CO tour, the officer serves one year as XO and one year as CO. This means that COs change every year and usually means that an officer will get two FITREPs a year, one for their annual, and one for the CO check out. Additionally, an officer will receive a final FITREP when he or she is checking out of a command. In her 2006 study on the effects of the SWOCP bonus in retaining quality officers, Lorio develops a formula to standardize FITREP scores (Lorio, 2006).

In any FITREP Navy-wide, a sailor is evaluated on several traits and given a score from 1 to 5. Those traits are:

- Professional expertise—Professional knowledge, proficiency, and qualifications.
- Command or organizational climate/equal opportunity—Contributing to growth and development, human worth, community.
- Military bearing/character—Appearance, conduct, physical fitness, adherence to Navy Core Values.
- Teamwork—Contributions toward team building and team results.
- Mission accomplishment and initiative—Taking initiative, planning, prioritizing, achieving mission.
- Leadership—Organizing, motivating and developing others to accomplish goals.
- Tactical performance—(Warfare qualified officers only) Basic and tactical employment of weapon systems. (Department of the Navy [DON], 2008)

These scores are averaged to come up with a Member Trait Average (MTA). However, some reporting seniors may generally score people higher or lower than other reporting seniors. In order to account for this variability, each FITREP is accompanied by the Reporting Senior's Cumulative Average (RSCUMAVG), which is the average of all the traits that reporting senior has ranked in all their subordinates up to that FITREP. Lorio uses these factors to come up with an adjusted MTA using the following formula:

$$\text{MTA}_{\text{adjusted}} = (\text{MTA} - \text{RSCUMAVG}) / (5.0 - \text{RSCUMAVG})$$

She then adds a time-decay factor to come up with what she calls the Level of Officer Retention and Inventory Optimizer (LORIO) score, which is a numeric value between negative 1 and 1. The purpose of the time-decay factor is to more heavily weight the scores of more recent FITREPs as opposed to older ones (Lorio, 2006).

In practice, officer's MTAs are not the most important part of the FITREP. What holds far more weight is the section of the FITREP that ranks the officer against his peers. More often than not COs, knowing how much more important ranking is to screen boards and officer advancement, will rank their officers and then make the MTAs match accordingly. This is part of the reason that it is desirable for an officer wishing to advance to go to a command at which they compete with a large pool of junior officers. A final

FITREP listing the officer as 1st out of 30 is far more desirable than one listing 1st out of 5 or even 1st out of 1.

While FITREPS are an important way to measure officer quality, it is not the only way the Navy decides the overall value of a given sailor. The Navy also wants officers to take challenging, competitive jobs. These jobs may be valuable to the Navy because they have determined that they add to the overall development of an aviation officer, or they may be of value because they are difficult jobs that must be filled. An officer could get a high LORIO score by getting good FITREPs, but if that is done while taking jobs that the Navy does not consider to be high priority, or if the officer is not competing with many other officers, then that officer may not have the highest value to the Navy. The LORIO score also does not take into account non-observed FITREPs, which are given in certain commands including training commands and educational institutions. Separating good officers from bad ones is not nearly as simple as looking at FITREP scores. Luckily, processes are already in place that determine the overall value of an officer to the aviation community: the respective selection boards to O4 and for Department Head. This simple metric more accurately encompasses the value that the community places on the officer's skills and experience.

2. Surface Warfare Officer Continuation Pay

The Surface Warfare Officer Continuation Pay (SWOCP) has historically been a one-size-fits-all bonus similar to the ACCP but offered to Surface Warfare Officers to incentivize them to stay in the SWO community and complete two Department Head tours. Of note, Department Head tours in the SWO community are lieutenant billets as opposed to lieutenant commander billets for aviation. This is due to the time to train in aviation, which only allows for one squadron tour before being considered for O4. Several studies have pointed to the ineffectiveness of the SWOCP bonus. Lorio concludes that the SWOCP is a tool for retention of quantity but fails to retain quality officers (Lorio, 2006). Additionally, Marenko finds that retention of SWO officers is affected significantly by economic health indicated by national unemployment rates and showed no correlation between SWOCP levels and SWO retention (Marenko, 2014).

In 2015 the SWO community recognized the limitations of a one-size-fits-all bonus and adopted a bonus system that rewarded good performance and incentivized officers to commit to the bonus early in their careers. Under the new bonus system, officers who are screened for Department Head on their first look and who accept the bonus immediately are able to make a total of \$105k paid through to their 10th year of commissioned service. Those screening for Department Head on their second look can make \$95k, and those screening on their third look can make \$75k. Initial payments for those screened on their first or second look are \$10k a year and then go up to \$15k a year after six years of commissioned service (CNO, 2016). Should an officer delay in signing up for the bonus, those initial payments are forfeited for each year the officer delays.

The problems with the SWOCP bonus mirror closely those of the ACCP. There has been a perception in the Navy that the SWO community does not retain high-quality officers and is forced to promote and retain lower-quality officers as a result. This leads to the poor leadership that many officers list as a reason for their exit from the Navy (Stoker, 2008). It has become a vicious cycle of poor retention and poor leadership. The SWO community aimed to break this cycle with its new bonus system, the effects of which remain to be seen. If the aviation community does not change how it retains its officers, it could fall into the same cycle the SWO community has been in.

3. AF Pilot Retention

A recent RAND report lead by Mattock does a thorough investigation of the impact of increased commercial airline hiring on Air Force pilot retention and what is needed to encourage Air Force pilots to stay Air Force. A number of factors have combined to lead experts to project that commercial airline hiring will increase in the next 20 years. High on that list is the fact that the aviation workforce is aging and the FAA has a mandatory retirement age of 65. When the baby boomers hit that mark, the airlines will need to have replacements on hand. The RAND report additionally notes that the FAA has recently made changes to requirements for pilot rest and requirements for minimum flying hours required to qualify as an airline transport pilot, both of which will add to airline demand for pilots. This is all compounded by the general increase in

demand for air transportation. True to the principles of supply and demand, the report observes that the salaries of pilots have also seen a marked increase back to levels observed in the late 1990s. This trend is expected to continue as the major airlines have come to an agreement with the pilot's union to increase pilot pay by approximately 17% from 2014 to 2018 (Mattock, 2016).

In order for the airlines to compensate for attrition due to pilot retirement alone, maintaining the current pilot inventory, Mattock determines that the airlines would have to increase hiring from 1,200 a year in 2014 to more than 2,800 in 2024. That is without bringing into account the projected growth in the airline industry. To determine how the growth in industry would affect pilot hiring they used passenger miles as an indicator. They projected a 29% increase in passenger miles by 2025. This effect on pilot hiring is mitigated somewhat by moderate increases in passenger miles per pilot (Mattock, 2016).

The study acknowledges a level of uncertainty in how airline hiring will increase and therefore investigates high, middle, and low levels of increase. They determine that increasing hires from 1,700 to 2,900 (low-level increase) per year would correspond to an increase in probability that a pilot will be hired by a major airline from 10% to 40%. The middle level increase to 3,200 hires would mean a 50% probability of being hired. And hiring levels at 3,800 would mean a 70% chance of being hired. Taking the middle estimate, an increase to 50% probability of being hired would lead to a 6.3% drop in Air Force pilot retention, or more than 800 pilots per year. While hiring is increasing for the major airlines, so are wages. Combining the middle estimate of 3,200 hires and a projected wage increase of 13% for pilots would lead to a decrease in force size of 12.3% or 1,587 pilots according to the report (Mattock, 2016).

Having determined how much Air Force pilot retention will be affected by changes in the airline industry, the study then seeks to determine how much the Air Force pilot retention bonus (ARP) would have to increase in order to offset these effects. The Air Force, much like the Navy, has two different pay extras for pilots. Aviator Pay (AP) equates to the Navy's Aviation Career Incentive Pay (ACIP) and is a monthly pay for all aviators up to \$840 a month. The Air Force's Aviator Retention Pay (ARP) is similar to the Navy's ACCP and is a bonus offered to aviators in return for signing a contract for

three years, five years, or until-20-years-of-aviation-service. This bonus is currently capped by DOD at \$25,000 per year. Using a modification of the Dynamic Retention Model (DRM) that the Air Force uses, the study concludes that with an increase of hiring to 3,200 a year and increased wages of 13% the ARP bonus would have to increase 94% to offset the retention losses. The range from best case assumptions to worst case assumptions produced a range of ARP increases from 54% to 151% (Mattock 2016).

The RAND study stops short of recommending that the Air Force increase ARP to that level, but does recommend that the DOD ask Congress to increase the cap on pilot bonus pay so that each service can react more quickly to the changing market demand for pilots in the civilian airline industry.

This study has obvious parallels with what the Navy will face in the coming years as well. Navy pilots will be faced with the same stay or leave decisions as Air Force pilots and will have the same growing opportunities as pilots in the civilian aviation industry. However, the DRM which the Air Force uses has been shown to not accurately predict Navy pilot retention (Watson, 2012). Regardless of the precision of the DRM model for the Navy, the trends remain the same, and the Navy can expect the same retention issues that the Air Force has seen. The Air Force's solution has been to ask Congress for a dramatic increase in the pilot bonus cap as part of the 2017 National Defense Authorization Act (Daniels, 2016). This will be enormously costly. By increasing the efficiency with which we administer the Navy's bonus, we can hopefully keep retention up without breaking the bank.

4. Navy Aviation Bonus as an Auction System

There has been discussion in the aviation community of instituting an auction system for the aviation retention bonus. The premise behind these proposed systems is that each aviator puts in a bid for how much of a bonus they are willing to accept in order to stay on for a Department Head tour and a minimum service commitment. The lowest bidders are retained and promoted.

The three primary variations of the auction system are the uniform-price auction, the Quality Adjusted Discount Auction (QUAD), and the Combinatorial Retention

Auction Mechanism (CRAM). Charts depicting the details of these auctions can be found in the Appendix. Under the uniform price auction, every aviator is offered the same bonus which is equal to one bid higher than the last person retained. The main drawback of this method is that the quality of the aviator is not taken into account. This problem is mitigated somewhat by the QUAD auction in which aviators bids are given “discounts” based on previous performance. This way, an aviator who has achieved certain milestones can be retained even if their bid was higher than what the cutoff would have been under the uniform-price system. A major obstacle to implementation of this system is determining what performance metrics to reward and how much. The Navy values not just FITREP scores but also aviators who take challenging billets and succeed in them. The QUAD system quickly loses the human element that a traditional screen board takes into account and instead becomes an exercise in how many “points” an aviator can rack up prior to the auction.

Finally, the CRAM auction takes into account non-monetary incentives that an aviator may value. It gives the aviator the opportunity to put not just an amount of cash that they desire to remain in aviation, but also other potential incentives such as graduate education, geographic stability in follow-on orders, or other pre-determined incentives that they Navy would offer as options. This method also runs into trouble in implementation as the Navy would have to first determine a monetary value for each of these incentives. How does the Navy price graduate education when it currently offers it for free to many officers with the understanding that the Navy gets inherently more value from a better educated workforce? Furthermore, a stipulation of the system is that *every* aviator, if their adjusted bid is low enough, is retained and granted whatever monetary and non-monetary incentive they requested. Many of the programs that would presumably be available as an incentive have strict quotas that are outside the aviation community’s control or even outside the control of the Navy as a whole. Also, the Navy often requires an officer to move in order to meet certain needs and also to keep the officer progressing in their career. Meeting every officer’s non-monetary requests would be a herculean task at best and would likely just not be possible.

A final shortcoming that applies to all of the auction systems is that auctions do not fit into the current promotion and screening system. Promotion boards are sat on by officers of all different communities in order to ensure that each officer selected for promotion is worthy of that rank. It is not within the aviation community's power to hand the promotion board a list of personnel that it would like to promote, especially if that list is not directly linked to prior performance but rather based on how much they are willing to work for.

IV. PROBLEMS FACING AVIATOR RETENTION

The rigid structure of junior officers' promotions in their first years of service and the Navy's preference for egalitarian pay structures makes retaining the best performers while culling the worst a difficult task. It is critical, however, to the continued excellence of the U.S. aviation force that we do just that. Identifying top performers and incentivizing them to stay is critical to any organization. Moreover, motivating middle and low performers to *become* top performers is even more important. This proposal should accomplish these goals.

The problem that the Navy faces is twofold. First, it needs to ensure that it is retaining the highest quality officers and in the appropriate quantities. To focus solely on quantity could lead to the same vicious cycle of poor leadership and poor retention as is perceived to occur in the SWO community. To focus solely on quality will leave billets unmanned. Second, it needs to make sure it is accomplishing this with the maximum efficiency possible. This means keeping the right people, and paying the right amount to induce them to remain in aviation and compete for Department Head and command billets respectively.

The Navy has the added constraint that morale and parity play a large role in compensation decisions. The Navy does not like to be perceived as paying people differently. The military pay scales are uniform across all services and are in the public domain available for all to see. This is part of the reason that the Navy and the military as a whole have shied away from pay-for-performance compensation structures. The military tends to rely on the assumption that higher performance will lead to faster promotion and as a result, increased pay. However, for the Navy at the junior officer level (O1-O3), promotions are based primarily on time in rank and not on performance. The first time a junior officer's promotion is dependent on their performance is promotion to the rank of O4, nine to ten years after initial commissioning. While this promotion is based on an officer's performance, the timing of their eligibility for the promotion is still largely independent of performance, despite some recent efforts by the Navy to make the timing more flexible (Chief of Naval Operations, 2015).

The Navy has already made efforts to make the ADHRB more efficient over the years. It recognized that offering one bonus to all aviators was a blunt instrument. In order to increase the bonus' efficiency, they first divided it by pilot vs. NFO, and then further specified it by T/M/S. The essential next step that the Navy must take is specifying it by officer quality. As it stands now, the Navy does not distinguish between high-quality and low-quality officers when offering the bonus. Within the same designator (Pilot or NFO) and T/M/S, all aviators are offered the same bonus.

In order to target the bonus to high-quality aviators we need to be able to tell which ones are high-type and which ones are low-type. The Navy must do this with limited information about the officer in question. An aviator NFO can be faced with a decision of whether or not to take the bonus after just two tours of duty. By the same token, the Navy must decide what bonus to offer that officer in the same short time frame. The first 2 to 3 years of an aviator's career are spent in flight school, where observed FITREPs are not received. For NFOs, after that they have a squadron tour and a shore tour to prove themselves and for the Navy to decide their value. Pilots have one additional tour. While aviators receive FITREPs throughout their tours, it is widely recognized in aviation as well as other communities that the only FITREP that really matters is the last one in a tour before the check-out FITREP. This is the one that will give the final ranking of the officer against his or her peers in the unit. In practice, the aviation community seems to decide one way or another whether an officer will succeed or not based on the quality of a *single* FITREP; the final one of their first squadron tour. There is what is often referred to as the "golden path" of jobs that will lead to Department Head and command. There are only so many of these jobs so it becomes competitive to be assigned to them. Whether an aviator is put on this path to command is determined largely on the merit of the final FITREP from their first tour. If the Navy is to differentiate early on which officers deserve a higher bonus and which ones deserve a lower one then it must do so with very limited data points. That is, unless they can induce the individuals to separate themselves accordingly which is exactly what this proposed plan will do.

By increasing the efficiency with which we administer the bonus and by retaining better quality officers we can also increase the quantity that we retain. In a 2014 officer retention survey in which aviators were asked questions regarding why people stay in or leave the Navy, the author concluded that the three actionable areas in which the Navy could affect retention were pay, Navy culture, and operational tempo (OPTEMPO) (Snodgrass, 2014). With an effective restructuring of the ACCP bonus we can not only affect pay, but also Navy culture, a major part of which is leadership. We will increase pay for the highest performers and keep our best leaders. Better leadership will help retention in the future as many officers cite poor leadership and communication as a reason for their departure (Doyle & Patrissi, 2014). By not overpaying those who are low performers we can save money and apply it to keeping the high performers that we need while maintaining the correct quantity of aviators retained.

THIS PAGE INTENTIONALLY LEFT BLANK

V. MENU OF CONTRACTS

So how do we keep the best quality officers and keep the numbers that we need to fill billets while also maintaining a perception of fairness and parity? The answer lies in a menu of contracts. By allowing officers to choose their own bonus structure we will maintain a sense of fairness in the bonus payouts while inducing aviators, knowing their own type, and maximizing their own interests, to self-select themselves into categories of high-type and low-type. This will maximize the efficiency of the bonus for the Navy.

A. PROPOSED BONUS PLAN

I propose that the Navy offer two bonuses to its aviators to incentivize them to complete a Department Head tour, and another two bonuses to induce aviators to stay for command. One bonus will be a tier 2 bonus and will pay out annually an amount 75% of the current bonus. The bonus will become available six years after an aviator's winging date for both pilots and NFOs, and payments will begin immediately upon contract acceptance. In return for the bonus, the aviator will be obligated to compete for, and if selected, to accept, orders as a Department Head. Payments will continue annually until the end of an aviator's Department Head tour at which time the payments will stop and the aviator is free from contractual service obligations. The tier 2 bonus may be taken at any time after the six year mark and before the end of a DH tour, but the payments will stop at the end of the DH tour no matter when the bonus was taken. Should an aviator fail to screen for O4 or Department Head, payments will be stopped immediately. If a pilot chooses not to accept either of these bonuses, he or she remains obligated to complete the eight years of aviation service required of them from winging. If an NFO chooses not to accept this bonus, he or she will be free to transfer or separate as they see fit as their initial winging obligation is complete.

The tier 1 bonus will initially pay out at one half the level of the tier 2 bonus. Upon selection to Department Head, the tier 1 bonus will pay out at levels significantly higher than the tier 2 bonus. Total payouts for a tier 1 bonus taker who accepts the bonus immediately and is selected for Department Head will be approximately 150% of the

current bonus, or double the tier 2 bonus. Those total payouts will be the same for all aviators who take the bonus immediately upon it being offered no matter when they are selected to Department Head. However, if they delay accepting the bonus they will forfeit the payment for each year they delayed.

The major stipulation to these two bonus options is that an aviator must choose which bonus they would like to be offered at the end of their first squadron tour. Upon locking in which bonus they will be offered, they can choose whether to accept or reject that offer at the six-year mark after their winging.

Since all Department Head contracts will terminate at the end of an aviator's Department Head tour, it will lend itself to flowing right into a similar contract system for command. Again, two contracts will be offered at the end of an aviator's Department Head tour. Tier 2 will be guaranteed immediate payments at 75% of the current command bonus and will obligate the aviator to compete for, and if selected to accept, orders for command of a squadron. Should an aviator fail to select for O5 or command, payments will stop.

Like the tier 1 Department Head bonus, the tier 1 command bonus will payout at half the rate of the tier 2 bonus. Payments will begin immediately upon contract acceptance. Upon selection for command, the tier 1 bonus will increase payments for a total payout of double the tier 2 bonus. At the end of their command tour, bonus payouts will stop and aviators are free from contractual obligations.

For both the ADHRB and ACRB, payments will be paused upon a single FOS. Should the aviator FOS a second time no more payments will be made. If the officer selects to the position in question on their second look then their payments will resume in addition to the missed payment. So, an officer selecting on their second look will be paid the same total amount as one selecting on their first look.

B. PLAN BREAKDOWN

This section will discuss the purpose of each element of the bonus plan and why it was included.

1. Early Selection of Bonus Option

The selection by the bonus taker of their preferred bonus option early on is essential for the menu-of-contracts system to be effective. By selecting early, before they know the outcome of all their FITREPs and billet selection and all the other factors that contribute to being selected to Department Head, they indicate whether they expect to perform well or perform poorly. If the Navy were to wait and allow bonus takers to choose at a later point in their career, then the officer could look at his or her past performance and determine the chances of making Department Head and choose the bonus accordingly. This system incentivizes the tier 1 bonus takers to maximize their efforts to be selected to Department Head so that they receive the high payoff. It also alleviates the burden on the Navy to determine which aviators to offer the high bonus level and which to offer the low bonus level. The aviators will self-select into the appropriate category based on their expected ability to receive the payout. It does not pay for a low performer to choose the tier 1 bonus as he will only receive the lower payment levels before being screened out by O4 or Department Head selection boards. The low performer will choose the tier 2 bonus because it guarantees a higher level of payment before they are screened out. If they are a middle performer and not sure if they can be selected for Department Head, then they either are screened for Department Head and the Navy has received a discount and paid less money for a Department Head, or they do not make it and the Navy has paid less money to them before they are forced out.

2. Six-Year Mark

Under the old system the point at which an aviator can take the bonus is dependent on their ADSO date. Thus, it is significantly different for NFOs, who incur a six-year service obligation after winging, and pilots, who incur an eight-year obligation. The decision to make the contracts available at the six-year mark after an aviator's winging for both pilots and NFOs was made for several reasons. First, this 6-year mark is the critical decision point for NFOs; it is when their ADSO runs out. This is usually where most aviators make the decision whether to stay in for a career or to get out of aviation. In 2000 the Navy learned the lesson that it needed to have the bonus available to

aviators when their ADSO runs out. That is why they changed the ACCP structure to ensure that it was available even if an officer was on a shore tour. So, the latest the Navy should have this bonus available is six years after winging.

In order for the menu-of-contracts system to be effective, there must be some time separation between signing the contract and achieving the desired milestones that trigger the higher bonus payout. If the signing of the contract and the realization one way or another of whether those milestones have been met are too close in time, then it does not incentivize low-type individuals to select into the guaranteed lower bonus category. If they are expecting only one or even zero bonus payments to be half the size, then if they think they have even a small chance of making Department Head it pays for them to select the tier 1 bonus as the payout is much greater.

We also cannot have the bonus offered too early because officers will be reluctant to sign up for a bonus obligating them to more service when they already have years left on their current service obligation. Circumstances can change in those years and they may be afraid of signing the contract and then a couple of years later, wanting to get out of the Navy. An explanation of how we incentivize pilots to do that follows.

3. Stopping Payment after DH Tour

By stopping payment and obligation after the Department Head tour, the Navy disincentivizes aviators from delaying accepting the bonus until they are certain of the outcome of their O4 and Department Head boards. Delaying the decision to take the bonus can only hurt the officer as they are missing out on potential payments.

This element of the bonus also alleviates the concern that pilots will be hesitant to obligate themselves to more years of service when they still have another two more years of service obligation. Should pilots want to get out at the earliest off ramp then they need only reject the bonus and serve out their final two years before they can exit the service. If they are unsure of whether or not they want to get out, they can delay their decision to take the bonus until those two years have elapsed, but they are penalized because they will miss those bonus payments. In order for an aviator to receive the full bonus amount, they must accept the bonus at the earliest possible point.

Stopping payment of this bonus after the DH tour will also incentivize officers to take the command bonus so that they can continue at close to their current revenue stream. The danger is that officers will elect to depart the service after their DH tour since they are no longer obligated to serve longer. However, at this point the officer has put in over 14 years of service and it is expected that the draw of the retirement payout at 20 years and the immediate command bonus opportunity will be enough to keep the officer in the service. Furthermore, under the new retirement plan, all officers are offered a bonus at 14 years of service, which obligates them to an additional four years. Combining this with the command bonus offers a large incentive to remain in the service. When the command and blended retirement bonus obligations expire officers are very close to the 20-year mark and retirement so it is expected that they will stay until then.

4. Continuous Offer versus One-Time Offer

By offering the bonus at any time and not just at the six-year mark the Navy accomplishes several things. First, a pilot at the six-year mark may intend to get out once his or her obligation is complete, but have a change of mind over the subsequent two years. Alternatively, an officer may just be unsure of committing to the extra service obligation yet. By providing the option of taking the bonus at any time keeps an incentive in place for the officer as he or she makes the final decision.

Second, the incentive to take the bonus immediately is already present, since the payments cut off at the end of the Department Head tour anyway. This means that in order to get all the payments, an officer must take the bonus immediately. By deferring the decision an officer only penalizes him or herself by missing payments (and saving the Navy money). In this way it cannot hurt the Navy to offer this, but only help.

5. Payment Pause for One-Time FOS

This bonus plan aims to limit the number and amount of payments to lower quality officers who do not select to Department Head or command. A single FOS is a good indicator that the aviator in question is a lower quality candidate. Should they ultimately be selected to the position, then they are paid the full amount of the bonus as if they had selected on the first look. However, by pausing the payment the Navy is able to

save that money should the aviator in question FOS a second time, which is quite common.

C. EXPECTED EFFECTS

1. Increased Retention of Highest Quality Aviators

This bonus system offers the highest bonus payouts to the highest performers, while avoiding the perception that the Navy is acting inequitably. Officers choose the bonus plan that maximizes their own individual potential earnings. High performers know they are high performers and choose the tier 1 bonus, with the expectation that they will achieve the required milestones and receive a higher payout. Low performers will opt for the tier 2 bonus which allows them to receive guaranteed payments whether or not they select to Department Head. We need to ensure we are keeping our best personnel or we could see a similar spiral of poor leadership feeding into poor retention that the SWO community is reported to be troubled with. This bonus system is an effective way to separate the high performers from the low performers and offer the high performers the appropriate bonus.

According to Kuhn and Yockey, the performance evaluation structure that best lends itself to a bonus system that offers a high-risk high-reward option and a low-risk low-reward option are those in which performance is evaluated individually (Kuhn & Yockey, 2003). This includes the Navy, where FITREPs, billet selection, all other measures of officer quality are based on individual performance. This means that an aviator's fate, with regards to promotion and selection to Department Head, is in his or her own hands. This is what people want when they are faced with a decision of whether to take the non-guaranteed, performance-based compensation package or the guaranteed, lower level compensation.

2. Increased Bonus Efficiency

This bonus program will increase the efficiency with which we pay out bonus funds. By offering the appropriate bonus to each individual aviator, the Navy could see a cost savings in addition to increased retention of quality officers. Figure 4 shows a chart

of potential outcomes for an aviator faced with these decisions. The chart assumes that those who choose not to take any bonus do so because they intend to leave the aviation community, either by leaving the military entirely or by transferring to a different community.

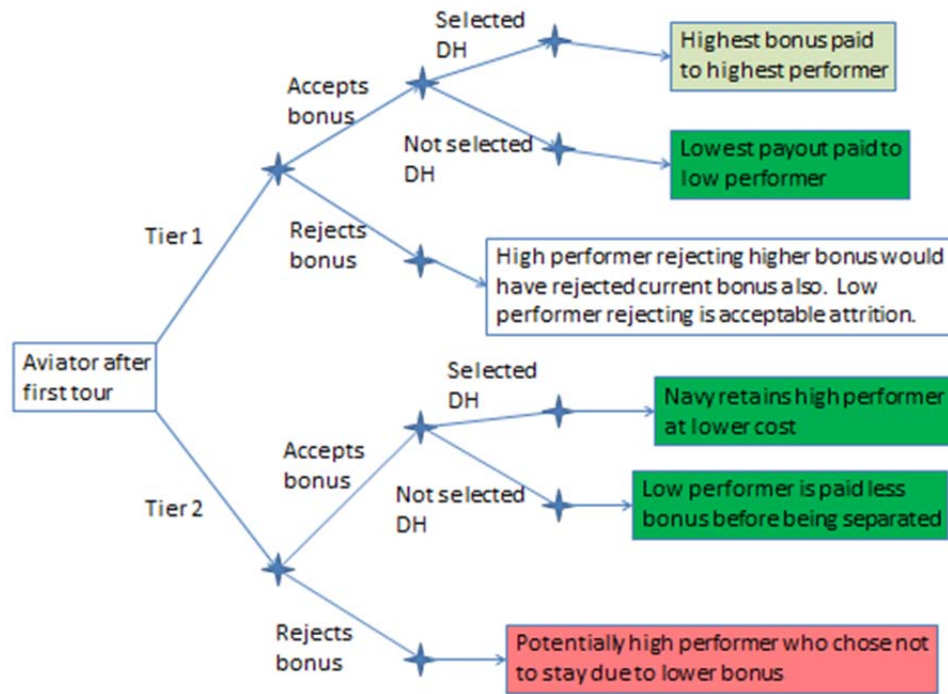


Figure 4. Possible Bonus Outcomes

As the chart shows, the main risk with this bonus system is that middle to high performers will choose the tier 2 bonus plan because they are not certain they can maintain a high level of performance. Then, when the time comes to decide whether to take the bonus or not, even if they have performed well and expect to be selected to Department Head, they may not choose to do so because the bonus level is lower.

In every other potential outcome, the Navy benefits or breaks even. If high performers choose the tier 1 bonus, accept it, and are selected for Department Head, as they are expected to, then the Navy has successfully targeted the bulk of the bonus to the high performers. In this case the Navy has paid more, but has retained the highest quality aviator. Low performers are not expected to choose the tier 1 bonus, but if they do so and

accept it, then, unless their performance improves greatly, they will presumably not be selected for Department Head. If that is the case, then they will receive only the lowest payout before they are screened out by either the O4 or Department Head boards. This saves the Navy money by paying low performers the least. If aviators choose the tier 1 bonus, thinking that they can perform well, but end up performing poorly, they may see that their chances of making Department Head are limited and instead choose to separate from the Navy or transfer communities. In this case the Navy has separated a low performer without having paid them any bonus. This also opens up the opportunity for that officer to transfer to a different community without waiting to be passed over once for O4, thereby potentially saving the Navy from separating an officer that may be more suited to a different community.

Aviators selecting the tier 2 bonus are middle-to-low performers who are unsure of their ability to be selected to Department Head. Those that ultimately perform well and expect to select to Department Head may accept the bonus. Thus, the Navy has retained a high performer at 75% of the cost of the current system. If a low performer takes the tier 2 bonus and does not expect to make Department Head he or she can still take the bonus as they could in the current system. Under this system though, the low performer will receive lower payments than are paid out at the current system before being screened out by O4 or Department Head boards. Again, another savings for the Navy.

3. Lower Payouts to Low Performers

Under the current system, NFO's in particular, and pilots to a lesser degree, can take the bonus and receive large sums of the total bonus before being screened out by O4 or Department Head boards. This system disincentivizes that behavior. Low performers who take either the tier 1 or tier 2 bonus and do not select to Department Head will receive less money annually than they would under the current system. On the other hand, low performing aviators that choose not to take the bonus, rid the aviation community of low performers sooner than if they waited for O4 or Department Head boards to screen them out.

4. Increased Motivation and Effort

Under this new system the incentives for high performers will be significant. This will motivate those taking the tier 1 bonus to maintain a high level of performance throughout their careers. The payoffs for doing so and being selected to Department Head will be significant, and the penalty incurred for not being selected is equally substantial.

Expended effort is something the Navy cannot observe and therefore cannot reward. Each officer makes a decision concerning the level of effort he or she will put in to being a top performer. The Navy has no way to observe the effort the officer expends, they can only observe result of that effort, the officer's performance, and that may not become observable until well after the effort has been expended. For instance, the officer knows that they are putting in the effort necessary to have a good final FITREP when they eventually leave a command, but that FITREP will not occur and become observable to the Navy until much later. This bonus is intended to induce middle and low performers to become high performers through the investment of added effort. The rewards for such effort are significant, for both the Navy and the aviator. From the Navy's standpoint, any tier 1 bonus taker is a net benefit. Those that select to Department Head are either naturally high performers who will have increased their effort in order to ensure selection, or middle or low performers who have invested their effort into becoming high performers. Even low performers who do not select to Department Head will presumably have still contributed more effort in his or her attempt to be selected, so the Navy still benefits. From the aviator's standpoint, they hope to be rewarded with the higher bonus payout for their investment in added effort.

5. Maintenance of Equity

The element of choice is essential in maintaining the perception of equity among aviation officers. Each officer gets to choose his or her own bonus plan, one that best fits their skills and their intentions. This alleviates concerns that the Navy would be seen as treating anybody unfairly or favoring some aviators over others. Simultaneously, it relieves the Navy of the responsibility of deciding who should get what bonus. Many officers will also appreciate having their fates and compensation more in their own hands.

D. POTENTIAL LIMITATIONS

1. Imperfect Promotion System

The main problem that this new system could encounter is derived from an imperfect promotion system. The promotion rates and promotion numbers vary from year to year, sometimes intentionally and sometimes not (Osborn, 2015). There also remain countless anecdotal stories of the one person who did everything right and did not get selected versus the other who performed marginally and did get selected. The truth of these anecdotes is not as important as the perception they reinforce: that selection to O4 and Department Head sometimes seems arbitrary. While this perception alone causes much frustration, it could be amplified significantly if individuals' pay is directly affected by these perceived discrepancies.

Beyond affecting morale after selection decisions have been made, the perception that chance plays a significant part in selection to Department Head could lead potential bonus takers to view the tier 1 bonus as too risky. In a survey obtained in personal correspondence with the Strategic Affairs Office of the Chief of Naval Personnel, of active duty respondents (officers and enlisted) across all communities, 64% of respondents said that timing played a bigger role on performance rankings than merit; only 6% said merit played a bigger role. Even if aviators believe that they can and will perform well, if they do not think that that performance will be rewarded with selection to Department Head, then they may not be willing to take the risk of taking the tier 1 bonus. Whereas the intent of the dual tier bonus system is to separate the best performers and target the larger bonus to them, if too much chance is involved in the decision, this could instead have the effect of separating the individuals with high risk tolerances from those with low risk tolerances.

2. Not Targeting Undecided Bonus Takers

This bonus system is designed to target the best performers. However, many times the best performers are such because they have a love for the Navy and intend to stay in no matter what. A risk of this bonus system is that it will funnel money to those who already intend to stay and not to those on the fence about staying or leaving. According to

a survey conducted as part of a 2014 Aviation Officer Retention Study, obtained in personal correspondence with the Strategic Affairs Office of the Chief of Naval Personnel, among the top three reasons people stay across all three ranks of LT, LCDR, and CDR were “patriotism,” and “loyalty to nation.” “Camaraderie” was also among the top three reasons for both LT and CDR with “benefits” taking the third biggest reason to stay in for LCDRs. With the exception of benefits for LCDRs, none of these retention factors are related to money. If money does not factor highly in aviators’ stay/leave decisions, then paying more may not have the desired effect. It is difficult to determine if we are currently keeping our best performers, much less whether or not this bonus would incentivize them to stay. The reason it is hard to determine if we are keeping our best performers is that the selection boards value both FITREP scores and which jobs are taken. A high performer may decide that he or she does not intend to stay and therefore decides to take a job that is more in line with personal interest than what the Navy wants. For instance, maybe they take a job in the pilot exchange program (PEP) because they want to travel overseas instead of taking the tour as a flight instructor at the Fleet Replenishment Group (FRG), a job the Navy values and rewards. Therefore, when the time for selection to O4 or Department Head arrives, although this pilot may be extremely capable, he or she may not appear so to the board and will not be selected. So a high performer may look like a low performer just because the officer decided that they are not planning to remain in aviation or in the Navy. Since the Navy has trouble telling whether it is keeping high performers or not, it becomes difficult to tell whether this new bonus would be able to effectively target those individuals. This could be mitigated by the increased effort the bonus system encourages. It will now be worth it for certain aviators to take the challenging orders and compete for Department Head versus the orders that align more with their own interests.

3. Reinforcing “Golden Path”

This also leads to another potential problem. The Navy has made efforts to get away from the “golden path” career progression (Kohlmann, 2015). They are trying to allow officers to advance while taking alternative career paths such as seeking graduate education or other non-standard tours. This emphasis on selection to Department Head,

added to the uncertainty involved in that selection, may make individuals hesitant to do anything that could jeopardize their chances of selecting to Department Head, such as taking alternative tours. It may make those jobs along the golden path even that much more competitive too. If more people are willing to take the tough jobs than there are jobs available, then things like timing of ones orders (luck) will end up playing a bigger part in getting those orders and subsequently in being selected to Department Head.

4. Earlier Payment for Pilots

Currently, NFOs can take their bonus five years after winging. This can be three years before an NFOs first look at O4, and if they are not selected in that board, it is an additional year before they are passed over again and separated. By this time they can be paid almost the entire bonus before they are screened out. We have mitigated this for NFOs by reducing the amount of those payments for both tier 1 and tier 2 bonus takers, by delaying the point at which they can take the bonus to six years, and by halting payment on one-time FOSs. However, we have created a similar situation for pilots, where they can be paid the bonus for an additional year before being separated. Whereas in the current system they cannot take the bonus until seven years of aviation service, under the proposed system they will be able to take it at six years. This is mitigated by the decrease of annual pre-FOS payments to NFOs as well as by lower payments to all aviators in this timeframe.

5. Earlier ADSO for ACRB Takers

The current ACRB obligates aviators to their 21st and 22nd years of service whereas the proposed system relieves aviators of that obligation at the end of their command tour, which is usually shortly before 20 years of service. The Navy can deem this an acceptable cost or it could mitigate by offering an additional bonus for the 21st and 22nd years. As the new retirement plan becomes the mandatory plan, the Navy could also use the built-in mid-career bonus at 14 years to keep aviators in the service up to 18 years, and then offer a bonus similar to the current ACRB to secure the 21st and 22nd years.

VI. SUMMARY, RECOMMENDATIONS, AND CONCLUSION

A. SUMMARY

In this study I incorporated research on signaling, separating equilibrium, moral hazard, adverse selection and other theoretical contract frameworks into the development of a retention bonus that meets the needs of the Navy aviation community and which fits into the current structure of an aviator's career progression and utilizes career milestones already in place. The Navy has so far steadily specialized the ACCP to avoid the adverse selection problem of offering too much bonus to some and too little bonus to others. First it divided the bonus according to pilot vs NFO, and then further divided it according to T/M/S. What it has thus far failed to do is divide the bonus according to performance. We currently offer too much bonus to low performers who are willing to stay and not enough bonus to keep high performers who have increased opportunities in other jobs and as such are more likely to leave. The menu-of-contracts system will ensure that we are paying sufficient bonus amounts to the highest quality aviators in order to induce them to stay while reducing excessive payments to low performers who have fewer opportunities for employment on the outside and thus need less incentive to remain in the Navy. The primary advantage of this system over the proposed auction system is that whereas the auction method targets those willing to stay in for the smallest bonus, a menu-of-contracts specifically targets high quality individuals. The menu-of-contracts system would also fit well into the current promotion and advancement framework of aviation officers.

B. RECOMMENDATIONS

One of the drawbacks of the menu-of-contracts system is that it relies on the Navy's current promotion system which is imperfect. In order for the menu-of-contracts to be effective, officers must have faith that their hard work and superior performance will be rewarded with promotion and selection to Department Head and command. The more there is a perception that luck plays a large roll in promotion decisions the less effective the menu will be in separating high quality from low quality. Consequently, I

recommend that further research be put forth towards improving the FITREP and promotion systems to more accurately reflect the quality of a given officer. The better we can measure the quality of an officer, the easier it will be to target and retain the high quality aviators over the low quality aviators.

Our greatest resource for solving the problems the Navy faces are the individuals facing those problems every day. The next step to implementing the menu-of-contracts system is to survey current and past aviators on the proposed system. Such a survey would help determine how many officers would be expected to choose each tier of the bonus, how such a choice might affect their stay/leave decisions as well as other career decisions. It could also open up a conversation within the community on how to fine tune its implementation to optimize keeping the right quality and quantity aviators while maintaining morale.

C. CONCLUSION

The menu-of-contracts system should be considered as a viable alternative to the current system or to the auction system that has been proposed to replace it. The menu-of-contracts can meet the retention needs of the Navy while increasing the efficiency with which the bonus is administered. This will lead to retention of higher quality aviators which will in turn increase morale leading to better retention in the future as well. It will also induce maximum effort for aviators throughout their careers as they strive for the highest possible bonus. The menu-of-contracts does all of this while maintaining the perception of egalitarianism and remaining within the current aviator career timeline and utilizing the promotion structure already in place.

APPENDIX

Table 4. Uniform-Price Auction Example. Source: Kelso (2014).

BID	RANK	RETAINED	BONUS PAID
\$56,000	1	YES	\$121,000
\$57,000	2	YES	\$121,000
\$66,000	3	YES	\$121,000
\$70,000	4	YES	\$121,000
\$89,000	5	YES	\$121,000
\$101,000	6	YES	\$121,000
\$108,000	7	YES	\$121,000
\$109,000	8	YES	\$121,000
\$121,000	9	NO	0
\$125,000	10	NO	0
\$128,000	11	NO	0
\$129,000	12	NO	0
\$134,000	13	NO	0
\$135,000	14	NO	0
\$148,000	15	NO	0
CUTOFF BID	\$121,000	TOTAL COST	\$968,000

Table 5. QUAD Auction Example. Source: Kelso (2014).

BID	RANK	QUALITY SCORE	ADJUSTMENT	ADJUSTED BID	ADJUSTED RANK	RETAINED	BONUS PAID
\$56,000	1	2	\$0	\$56,000	1	YES	\$89,000
\$57,000	2	1	\$0	\$57,000	2	YES	\$89,000
\$66,000	3	2	\$0	\$66,000	3	YES	\$89,000
\$70,000	4	2	\$0	\$70,000	4	YES	\$89,000
\$89,000	5	2	\$0	\$89,000	8	NO	\$0
\$101,000	6	3	-\$20,000	\$81,000	5	YES	\$109,000
\$108,000	7	3	-\$20,000	\$88,000	6	YES	\$109,000
\$109,000	8	1	\$0	\$109,000	11	NO	\$0
\$121,000	9	2	\$0	\$121,000	12	NO	\$0
\$125,000	10	3	-\$20,000	\$105,000	10	NO	\$0
\$128,000	11	4	-\$40,000	\$88,000	6	YES	\$129,000
\$129,000	12	4	-\$40,000	\$89,000	8	YES	\$129,000
\$134,000	13	1	\$0	\$134,000	14	NO	\$0
\$135,000	14	2	\$0	\$135,000	15	NO	\$0
\$148,000	15	3	-\$20,000	\$128,000	13	NO	\$0
CUTOFF BID	\$121,000			\$89,000		TOTAL COST	\$832,000

UNIFORM-PRICE AUCTION		
AVERAGE QUALITY	AVERAGE BONUS	TOTAL COST
2	\$121,000	\$968,000

QUAD AUCTION		
AVERAGE QUALITY	AVERAGE BONUS	TOTAL COST
2.625	\$104,000	\$832,000

Table 6. CRAM Auction Example. Source: Kelso (2014).

RESERVATION PRICE	RANK	VALUE OF NMI			CASH BID	CRAM BID	ADJUSTED RANK	RETAINED	COST OF BONUS			
		E	F	G					CASH	COST OF NMI		
										E	F	G
\$56,000	1	\$0	\$40,000	\$13,000	\$3,000	\$23,000	1	YES	\$81,000	\$0	\$10,000	\$10,000
\$57,000	2	\$0	\$0	\$0	\$57,000	\$57,000	3	YES	\$101,000	\$0	\$0	\$0
\$66,000	3	\$5,000	\$0	\$0	\$66,000	\$66,000	4	YES	\$101,000	\$0	\$0	\$0
\$70,000	4	\$0	\$29,000	\$0	\$41,000	\$51,000	2	YES	\$91,000	\$0	\$10,000	\$0
\$89,000	5	\$0	\$0	\$25,000	\$64,000	\$74,000	6	YES	\$91,000	\$0	\$0	\$10,000
\$101,000	6	\$27,000	\$19,000	\$0	\$55,000	\$75,000	7	YES	\$81,000	\$10,000	\$10,000	\$0
\$108,000	7	\$0	\$0	\$0	\$108,000	\$108,000	10	NO	\$0	\$0	\$0	\$0
\$109,000	8	\$0	\$48,000	\$0	\$61,000	\$71,000	5	YES	\$91,000	\$0	\$10,000	\$0
\$121,000	9	\$0	\$0	\$0	\$121,000	\$121,000	13	NO	\$0	\$0	\$0	\$0
\$125,000	10	\$0	\$35,000	\$0	\$90,000	\$100,000	8	YES	\$91,000	\$0	\$10,000	\$0
\$128,000	11	\$12,000	\$13,000	\$0	\$103,000	\$123,000	14	NO	\$0	\$0	\$0	\$0
\$129,000	12	\$0	\$0	\$0	\$129,000	\$129,000	15	NO	\$0	\$0	\$0	\$0
\$134,000	13	\$0	\$24,000	\$0	\$110,000	\$120,000	12	NO	\$0	\$0	\$0	\$0
\$135,000	14	\$0	\$44,000	\$0	\$91,000	\$101,000	9	NO	\$0	\$0	\$0	\$0
\$148,000	15	\$0	\$45,000	\$0	\$103,000	\$113,000	11	NO	\$0	\$0	\$0	\$0
	\$121,000	\$39,000	\$297,000	\$38,000	CUTOFF BID	\$101,000			\$728,000	\$10,000	\$50,000	\$20,000
									CRAM		UNIFORM-PRICE AUCTION	
									CASH	\$728,000	CASH	\$968,000
									NMI COST	\$80,000	NMI COST	\$0
									TOTAL COST	\$808,000	TOTAL COST	\$968,000

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Chassagnon, A., & Chiappori, P.A. (1997, March) *Insurance under moral hazard and adverse selection: The case of pure competition*. Retrieved from ResearchGate website: https://www.researchgate.net/profile/Pierre_Chiappori/publication/5067432_Insurance_Under_Moral_Hazard_and_Adverse_Selection_The_Case_of_Pure_Competition/links/544503450cf2534c76602daa.pdf
- Chief of Naval Operations (2015, 10 Dec.) *Notice of convening FY-17 Navy active-duty promotion selection boards* (NAVADMIN 281/15) [Memorandum]. Washington, DC: Author. Retrieved from <http://www.public.Navy.mil/bupers-npc/reference/messages/Documents/NAVADMINS/NAV2015/NAV15281.txt>
- Chief of Naval Operations (2016, 15 Sep.) *Surface Warfare Officer Department Head Retention Bonus* (NAVADMIN 206/16) [Memorandum]. Retrieved from <http://www.public.navy.mil/bupers-npc/reference/messages/Documents/NAVADMINS/NAV2016/NAV16206.txt>
- Coughlan, P. J., Gates, W. R., & Myung, N. (2013, October). *The combinatorial retention auction mechanism (CRAM)* (Technical report). Retrieved from <http://calhoun.nps.edu/bitstream/handle/10945/37889/NPS-GSBPP-13-004.pdf?sequence=3&isAllowed=y>
- Daniels, J. (2016, 19 Aug.) Retention bonus pay for Air Force pilots could swell above \$400,000. (CNBC news article) Retrieved from <http://www.cnbc.com/2016/08/19/air-force-paying-huge-retention-bonuses-to-fighter-pilots.html>
- Department of the Navy (2008, Jul. 09). *Navy Performance Evaluation System* (BUPERS Instruction 1610.10B PERS-311). Retrieved from <http://Navyfitrep.com/files/161010.pdf>
- Department of the Navy (2012, 19 Mar) *Introductory Flight Screening* (IFS) Program (CNATRAINST 3501.1C). Retrieved from http://www.netc.Navy.mil/nascweb/CNATRAINST_3501_1C_IFS_Program_19Mar12.pdf
- Department of the Navy (2016, 21 Apr). *Order convening the FY-17 aviation department head selection board* (1402 PERS-00). Retrieved from <http://www.public.Navy.mil/bupers-npc/boards/screenboards/aviation/Documents/!UPDATED!%20Signed%20FY17%20ADHSB%20Conv%20Order.PDF>
- Department of the Navy (2017, 13 Sep) *Flight training instruction, SNFO Instrument navigation, T-6A*. (CNATRA P-871). Retrieved from <https://www.cnatra.Navy.mil/local/docs/pat-pubs/P-871.pdf>

- Department of the Navy, *FY-15 Aviation Command Retention Bonus Program Information*. [Memorandum]. . Washington, DC: Author. Retrieved 27 Feb 2017 from <http://www.public.navy.mil/bupers-npc/officer/Detailing/aviation/OCM/Documents/AllFY15ACCPProgramsPDF.PDF>
- FY-15 Aviation Department Head Retention Bonus Program Information. (2015, Apr 30) *Attachment 1 to ASN(M&RA)* [Memorandum]. Retrieved from <http://www.public.navy.mil/bupers-npc/officer/Detailing/aviation/OCM/Pages/ACCP.aspx>
- FY-16 Aviation Command Retention Bonus Program Information. (2015 Sep 16). *Attachment 1 to ASN (M&RA)* [Memorandum]. Retrieved 27 Feb 2017 from <http://www.Public.Navy.mil/bupers-npc/officer/Detailing/aviation/OCM/Documents/FY16ACRBProgramInfo16Sep2015.pdf>
- FY-16 Aviation Department Head Retention Bonus Program Information. (2016 Apr 08). *Officers with Winging ADSO expiring in FY2016*. Attachment 1 to ASN(M&R) [Memorandum]. Retrieved from <http://www.public.navy.mil/bupers-npc/officer/Detailing/aviation/OCM/Pages/ACCP.aspx>
- FY-17 Aviation Department Head Retention Bonus Program Information. (2016 Apr 08). *Officers with Winging ADSO expiring in FY2017*. Attachment 2 to ASN (M&RA) [Memorandum]. Retrieved from <http://www.Public.Navy.mil/bupers-npc/officer/Detailing/aviation/OCM/Pages/ACCP.aspx>
- FY-18 Aviation Community Brief (n.d.). Retrieved 27 Feb 2017 from <http://www.Public.Navy.mil/bupers-npc/boards/activedutyofficer/Documents/FY-18%20ACTIVE%20LINE%20OFFICER%20COMMUNITY%20BRIEF.PDF>
- Incentive pay: Aviation career, 37 U.S. Code § 301a (2006). Retrieved from <https://www.law.cornell.edu/uscode/text/37/301a>
- Kelso, E. W. (2014). *Improving the efficiency of aviation retention bonuses through the use of market mechanisms* (Master's thesis). Retrieved from Calhoun <http://calhoun.nps.edu/handle/10945/42658>
- Kohlmann, B. (2015). What Secretary Mabus' reforms mean for the future of the Navy. Task and Purpose 14 May2015. Retrieved from <http://taskandpurpose.com/secretary-mabus-reforms-mean-future-Navy/>
- Kuhn, K. M., Yockey, M. D. (2003). Variable pay as a risky choice: Determinants of the relative attractiveness of incentive plans. *Organizational Behavior and Human Decision Processes*, 90(2), Retrieved from <http://www.sciencedirect.com/science/article/pii/S0749597802005265>

- Lorio, J. L. (2006) *An analysis of the effect of Surface Warfare Officer Continuation Pay (SWOCP) on the retention of quality officers* (Master's thesis). Retrieved from Calhoun <http://calhoun.nps.edu/handle/10945/2830>
- Marenko, M. (2014). *Does the economy or surface warfare officer career pay affect surface warfare officer retention* (Master's thesis) Retrieved from Calhoun <http://calhoun.nps.edu/handle/10945/44610>
- Mattock, M. G., & Project Air Force (U.S.). (2016). *Retaining U.S. Air Force Pilots when the civilian demand for pilots is growing*. Santa Monica, CA: RAND. Retrieved from http://www.rand.org/pubs/research_reports/RR1455.html
- Military Pay Charts—1949 to 2017. Retrieved on 17 Feb 2017 from <https://www.dfas.mil/militarymembers/payentitlements/military-pay-charts.html>
- Moore, C. S.; Griffis, H. S. (1999) Evaluating the Navy Aviation Career Continuation Pay Proposal Center for Naval Analyses Alexandria, VA. Retrieved from <http://www.dtic.mil/docs/citations/ADA361445>
- Naval Aviation Schools Command (2017) Aviation Preflight Indoctrination Overview. Retrieved from <http://www.netc.Navy.mil/nascweb/api/api.htm>
- Naval Aviator Training. (2017) Retrieved from <https://www.cnatra.Navy.mil/training.asp>
- Osborn, K. Low promotion rates for navy pilots yield changes to process 17 Feb 2015. retrieved from <http://www.military.com/daily-news/2015/02/17/low-promotion-rates-for-Navy-pilots-yield-changes-to-process.html>
- Parrish, K.. (2016, Feb.). DOD plans benefit revision with “blended retirement.” Retrieved from <https://www.defense.gov/News/Article/Article/655705/dod-plans-benefit-revision-with-blended-retirement>
- Snodgrass, G. M. (2014). *Keep a weather eye on the horizon: A Navy officer retention study*. *Naval War College Review* (67) 4. Retrieved from <https://www.usnwc.edu/getattachment/66837e4f-702f-4293-b653-cfa9dd4df1ab/Keep-a-Weather-Eye-on-the-Horizon--A-Navy-Officer-.aspx>
- Special and incentive pays (2014, Sep 12) Retrieved from <https://www.dfas.mil/militarymembers/payentitlements/specialpay.html>
- Special pay: Aviation career officers extending period of active duty, 37 U.S. Code § 301b (2015). Retrieved from <https://www.law.cornell.edu/uscode/text/37/301b>
- Spence, M. (1973, Aug.) Job market signaling *The Quarterly Journal of Economics* (87), pp. 355–374. Retrieved from <http://www.econ.yale.edu/~dirkb/teach/pdf/spence/1973%20job%20market%20signalling.pdf>

- Stoker, C., & Crawford, A. (2008). *Surface warfare officer retention: Analysis of individual ready reserve survey data*. (Master's thesis). Retrieved from Calhoun <http://calhoun.nps.edu/handle/10945/33784>
- United States Department of Justice. (2015, 11 Dec). Retrieved from <https://www.justice.gov/crt-military/scra>
- Wang, G. H. (1998). "Bargaining over a menu of wage contracts." *Review of Economic Studies*. Retrieved from <https://academic.oup.com/restud/article-abstract/65/2/295/1580772/Bargaining-over-a-Menu-of-Wage-Contracts>
- Watson, S. (2012). *Using a dynamic retention model to analyze the impact of aviation career continuation pay on the retention of naval aviators*. (Master's thesis). Retrieved from Calhoun <http://calhoun.nps.edu/handle/10945/17475>
- Williams, B. M. (2015). *Evaluation of aviation career pay incentives among the Naval Aviation enterprise utilizing auction mechanisms*. (Master's thesis). Retrieved from Calhoun <http://calhoun.nps.edu/handle/10945/45275>

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California