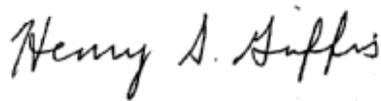# The Analysis of the T+X Program and a Proposal for a New Pilot

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CNA
ANALYSIS & SOLUTIONS

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Executive summary

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Traditionally, the Navy has set sailors' initial contract lengths to ensure a return on investment (ROI) from sailors' training. The current mix of 4-, 5-, and 6-year Navy enlistment contracts is partially a result of this ROI framework. However, this approach is not necessarily aligned with the sea-shore flow. We find that many sailors' end of active obligated service (EAOS) comes before the end of their first prescribed sea tour (PST), which follows training. Because those sailors whose EAOS doesn't cover their PST complete their PSTs at much lower rates, we conclude that aligning PST and EAOS by increasing initial obligation would increase overall sea tour completion rates.

The "T+X" pilot does exactly that for several ratings. The program started in 2011, so our data on its participants are fairly recent. Nevertheless, with the caveat that our analysis is based on a small sample over a short period of time, we find that, so far, there is no evidence that lengthening obligations for T+X sailors has changed recruit composition or early attrition rates. Based on these findings, we present simplified estimates of cost savings resulting from lengthening obligations in T+X ratings. These savings range from $7.35 million to $11.67 million per year, depending on economic conditions.

Finally, we discuss the shortcomings of the data on enlistment incentives and the ways it prevents us from precisely identifying the cost of extra commitment from recruits. We also suggest ideas for future pilot programs, including several randomized experiments, which would help fill the current data gaps.

Motivation

- The Navy sets contract length using a return on investment (ROI) framework, but the relationship is not exact.

- Many sailors complete their first contract in the midst of a prescribed sea tour (PST), necessitating removal and replacement while at sea.

- The T+X pilot program bases the required enlistment length explicitly on the length of initial training (T) plus the length of the initial sea tour (X).

- The Navy wants to modify contract lengths to align with sea tour completions and to support enhanced carrier presence.

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The Navy has traditionally set sailors' initial contract lengths to ensure a return on investment (ROI) from sailors' training. The current mix of 4-, 5-, and 6-year Navy enlistment contracts is partially a result of this ROI framework. Today, although there is some correspondence between initial obligation and length of the training pipeline, the relationship is not exact. Some variation occurs because sailors incur additional obligation in exchange for Enlistment Bonuses (EBs). Additional variation is due to the Navy's ability to increase contract length in highly desirable ratings.

Because of the variation in training time and contract lengths within and between ratings, the end of active obligated service (EAOS) for many sailors comes before the end of their first prescribed sea tour (PST), which follows training. This mismatch results in sailors having to be replaced at sea often and without sufficient time, which in turn causes variance in the demand signal for distribution and training, and comes with substantial Permanent-Change-of-Station (PCS) costs.

The T+X pilot, which started being implemented in 2011, proposes that enlistment contract lengths for enlisted communities should be based on the length of training (T) plus the length of the initial operational tour (X). T+X is meant to align the sailors' PST, Planned Rotation Date (PRD), and EAOS. The framework behind the analysis of optimal enlistment contract lengths is described in detail in the companion memorandum, *Adjusting First-Term Contract Lengths in the Navy: Implications and Recommendations.* This annotated briefing focuses on the analysis of the T+X pilot and its potential to increase sea tour completion rates.

Data

- Enlisted Master Record (EMR)
  - Tracking sailors quarterly
  - Measures of sailor diversity
  - Measures of sailor quality
  - Obligation lengths

- CNA's Street-to-Fleet file
  - Length of the training pipeline

- Our outcome measures:
  - Attrition during the first term
  - Sea tour completion

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For this analysis, we used CNA's extracts of the Enlisted Master Record (EMR), which enabled us to track sailors on a quarterly basis. These data allow us to look at all important aspects of sailors—namely, their demographic and military characteristics. CNA's Street-to-Fleet database (based on the Navy Integrated Training Resources and Administration System (NITRAS)) allowed us to analyze the lengths of sailors' training pipelines. Note that, for simplicity, we omit women from this analysis altogether, and we look only at sailors' Soft EAOS (SEAOS). We start our analysis by addressing the potential for increasing sailors' sea tour completion rates. We then address the ongoing T+X pilot program, which increases obligations for sailors in certain ratings in order to increase sea tour completion. Finally, we discuss some shortcomings of the data available and suggest potential future data collection efforts to improve future analyses.

Sea tour incompletion driven by contract length

Observation Years		Length of PST		
		48 months	54 months	60 months
1994-2006	Percent incomplete due to EAOS loss*	57%	40%	56%
2007-2011	Percent incomplete due to EAOS loss*	49%	39%	46%

Sea tour incompletions are largely due to the mismatch between initial obligation and prescribed sea tour (PST) length

* These rates describe sea tour incompletions for men, whose PST did not change during their sea tour. The data come from a CNA study, "Analysis of Sea Tour Incompletion Rates and Reasons," by Molly McIntosh and David Gregory.

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Our first task was to verify that sea tour incompletions are, in fact, driven by contract length. We initially looked at data between 2004 and 2008 since sailors who accessed later than 2008 wouldn't have reached EAOS or the end of their PST (using PST at the start of the sea tour) by this time. In those years, the sea tour completion rate of sailors whose EAOS comes before the end of their PST is about 22%; for those whose EAOS covers their PST, the rate was about 60% overall, reaching a high of 79% in 2008. These estimates, however, do not consider that PSTs can change for sailors during their sea tours. To address this, we leverage data from a recent CNA study on sea tour incompletions in which the authors show, by looking at male sailors whose PSTs do not change throughout the sea tour, that EAOS losses account for 40% to 50% of sea tour incompletions, depending on sea tour length and observation time. We see a slight decrease in the numbers from before 2007 to after 2007, perhaps because sailors started leaving the Navy at lower rates during the economic depression. Yet, in the authors' sample, 49% of 48-month sea tours, 39% of 54-month tours, and 46% of 60-month tours were not completed from 2007 to 2011 because sailors reached their EAOS before the end of their sea tours. This tells us that, despite some sailors completing their sea tours even when they extend service past their EAOS (through extensions and reenlistments), close to half of sea tour incompletions result from a Navy policy that sets EAOS to expire before PST. To understand the magnitude of this problem, we checked what proportion of sailors would fall into each category and found that 82% of FY11 accessions and 83% of FY12 accessions have PSTs that extend beyond their EAOS. We conclude that lengthening obligation to include the entire first sea tour length would help improve sea tour completion rates.

T+X analysis

- FY 2011 T+X ratings: AO, EMSW, GSE, and QM

- "THE PILOT INCREASES THE INITIAL ACTIVE OBLIGATION (EAOS) FROM FOUR YEARS TO FIVE YEARS … FOR THESE FOUR RATINGS THE PST AND PRD FOR THE INITIAL SEA TOUR WILL BE SET TO EQUAL THE INDIVIDUAL SAILOR'S EAOS"

- As of August 2012, proportions of "aligned" EAOS and PRD dates:
  - AO: 356/385 = 92%
  - GSE: 46/71 = 65%
  - EM(SW): 126/132 = 95%
  - QM: 52/63 = 83%

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The T+X pilot is being implemented in phases. Phase I began in FY11 with the following 4 ratings: AO, EM(SW), GSE, and QM, as specified in NAVADMIN 201/11. In FY13, 11 ratings were added to the program in Phase II, as specified in NAVADMIN 361/12: ABE, ABF, ABH, AME, BM, GSM, MM(SS), MM(SSW), OS, SH, and CS(SS). In FY14, 3 more ratings—CS, LS, and LS(SS)—will be added to the program. For all T+X ratings, obligations have increased from 4 to 5 years. In addition, the goal of T+X is to align PST, PRD, and EAOS.

The PST actually assigned to the sailor is not recorded in the EMR. However, we wanted to get an idea of the rate of compliance with the T+X policy. We cannot observe any meaningful outcomes for the Phase II or III ratings, so when examining the alignment of EAOS and PRD for the T+X ratings, we focus only on sailors in the 4 original T+X ratings. We also focus only on sailors on type 2 sea duty (home-ported/home-based in CONUS). We found that, for the AO and the EMSW ratings, more than 90% of sailors had their EAOS and PRD within 3months of each other. The QM rating had a lower compliance rate of 83%, and the GSE rating had a lower still compliance rate of about 65%. However, sailors in the GSE rating are more likely to have a tour in Hawaii, and the way these PSTs are assigned may contribute to the discrepancy.

T+X analysis: choice of ratings

Observation Years		T+X "phase-in" year for rating		
		FY11	**FY13**	**FY14**
2008-2011	**Avg. training time (T)**	7.8 months	6.5 months	5.5 months
	Published PST	60 months	54-60 months	36-48 months
	Mismatch?	Yes!	Some	Some
2011	**T**	7.1	6.0	5.5
	Published PST	51-54 months	51-55 months	48-54 months
	Mismatch with T+X?	Some*	No†	No†

*Mismatch due to non-compliance
† Projected

Next, we analyze how suitable the T+X ratings are for expansion from a 4-year obligation (4YO) to a 5YO. We start by looking at these ratings in 2008 through 2011, before the introduction of T+X in June 2011 (1st half of table). We then look at the same ratings after the T+X program was introduced (July 2011 onward, 2nd half of table). The FY13 and FY14 columns give data on ratings selected to join the program in those years.

Phase I T+X ratings had a training pipeline of 7.8 months, on average. In combination with a 60-month PST, there was a 20-month deficit between the sailors' 4YO and the total time required for them to complete training and their first PST. After the introduction of T+X, the training shortened to 7.1 months; according to the T+X directive, the PST, PRD, and EAOS were all supposed to align. Although there is still some mismatch, as we discussed on the previous slide, because PSTs recently became shorter for these ratings, we expect the alignment between PST, PRD, and EAOS to improve further.

Phase II T+X ratings had a training pipeline of 6.5 months before June 2011 and about 6.0 months since then. Previously, PSTs varied from 54 to 60 months; thus, 4YO sailors in these ratings would not be set up to finish their PSTs. Under T+X, PSTs for these ratings range from 51 to 55 months. In the aggregate, sailors' PRDs, PSTs, and EAOSs should align in these ratings. But, on a sailor-by-sailor basis, this may not be the case because of differences in the length of initial training.

Phase III T+X ratings also had a mismatch between PST, PRD, and EAOS before 2011, when their training pipeline was 5.5 months, their sea tours were primarily 48 months, but their total obligation was 4 years. Under T+X, with 5.5 months of training and a 48- or 54-month PST, these sailors' EAOSs should be sufficient to cover their first sea tours.

T+X analysis: diversity of recruits

Time period		FY11 T+X ratings	Other 4YO ratings	
2008-2011	# Sailors	2,035	19,453	
	# Black / #Hispanic	457 / 465	4,244 / 4,542	
	%Black / %Hispanic	22% / 23%	22% / 23%	
		FY11 T+X ratings	Other 5YO ratings	4YO ratings
2011-2012	# Sailors	862	2,308	9,234
	# Black / #Hispanic	211 / 169	200 / 455	1,714 / 1,619
	%Black / %Hispanic	25% / 20%	9% / 19%	19% / 18%

- In 2008-2011, racial / ethnic composition of the four ratings was similar to that of the other 4YO ratings.
- Since the introduction of T+X, the four ratings are more diverse than the rest of 4YO and 5YO Navy.

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In the next few slides, we look at the recruits in the T+X ratings. Although the program is new, and information is limited, we try to assess whether any meaningful changes have occurred in those ratings as a result of their longer initial obligation commitments. We start by looking at sailor diversity.

Before the T+X pilot, the proportions of black and Hispanic sailors were similar in the four ratings that would become part of the pilot and the rest of the 4YO Navy. Since the program started, we observe that it has more black and Hispanic sailors than either the other 5YO ratings or the 4YO ratings. The biggest difference is between the proportion of black sailors in the 5YO T+X ratings (25%) and other 5YO ratings (9%).
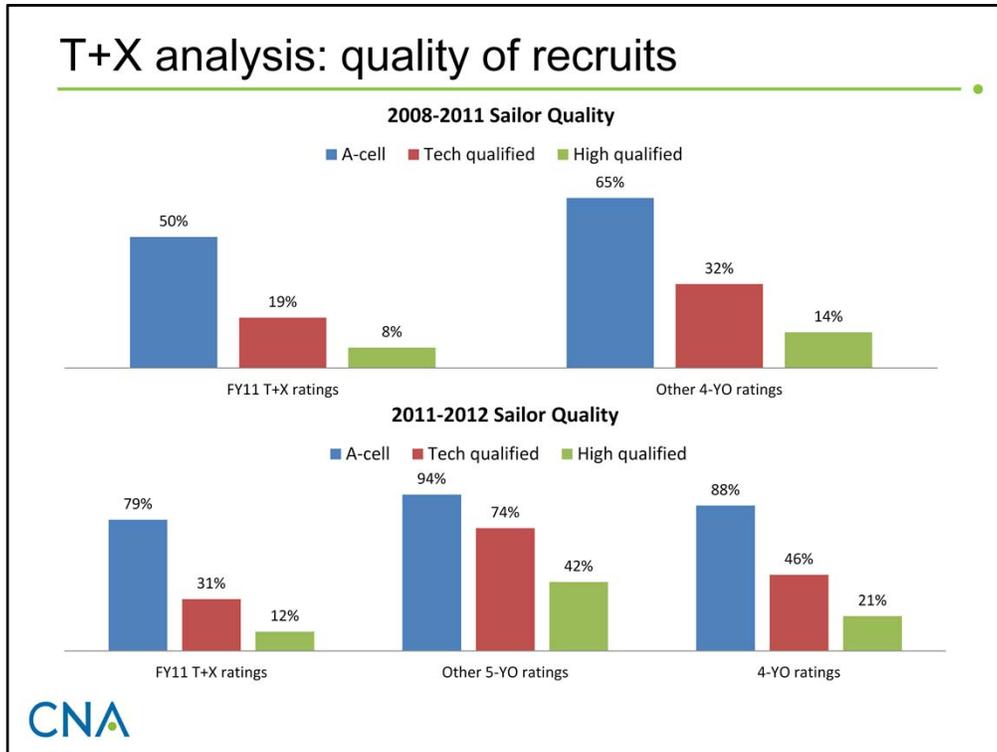
We next turn our attention to sailor quality—the factors that we know affect sailors' performance and attrition. The T+X program is so new that *actual* measures of performance and attrition are still coming in; quality indicators are an important measure of the *potential* success of this program. We define the quality indicators as follows:

- A-cell: Applicant holds a high school diploma or equivalent credential *and* has an AFQT score of 50 or higher.

- Technically qualified: Applicant holds a high school diploma or equivalent credential *and* has an AFQT score of 67 or higher.

- Highly qualified: Applicant holds a high school diploma or equivalent credential *and* has an AFQT score of 80 or higher.

From 2008 to 2011, the 4YO ratings that later entered T+X were filled by lower quality sailors overall than other 4YO ratings. Today, the T+X ratings are still behind other 4YO and 5YO ratings in terms of quality. However, the overall quality of the force has increased, and the T+X program participants reflect this improvement.

T+X analysis: fleet attrition

Time period		Type of ratings		
		FY11 T+X ratings	**Other 4-YO ratings**	
2008-2011	**# sailors**	2035	19453	
	# attrites	312	2935	
	Attrition rate	15.3%	15.1%	
		FY11 T+X ratings	**Other 5-YO ratings**	**4-YO ratings**
2011-2012	**# sailors**	862	2308	9234
	# attrites	15	29	168
	Attrition rate	1.7%	1.3%	1.8%

- Before the introduction of T+X, attrition in these ratings was similar to that of the rest of the Navy.
- Currently, the attrition in T+X ratings is slightly higher than in the rest of the 5YO Navy (and is similar to the 4YO Navy), but the difference is not statistically significant.

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In the 2008–2011 time period, the four FY11 T+X ratings had a fleet attrition rate similar to the other 4YO ratings (we look at attrition after training from the fleet any time before EAOS). As the obligation in those ratings increased to 5 years, we observe an early fleet attrition rate that is similar to the 4YO ratings but is slightly (and not statistically significantly) higher than the early fleet attrition rate in the other 5YO ratings (we measure attrition any time before August 2012). On one hand, this finding is not surprising since we noted earlier that the quality of the sailors entering these ratings has not necessarily improved just because of the change in obligation. On the other hand, because of how recently the program was introduced, it is likely too early to look for a meaningful difference in fleet attrition. As more time goes by, and as sample sizes increase, we will be able to make more definitive statements about the attrition in T+X ratings and how they compare with other 5YO and 4YO ratings.

T+X analysis: cost savings analysis

- Recruiting
  - 2008 estimates suggest it costs $25K to recruit an A-cell
  - 2013 estimates are lower – around $13K given the current unemployment rate
  - Recruiting got cheaper because of the economy, cuts to the number of recruiters, and the absorption of costs of educational benefits by the VA through the GI Bill.

- It costs between $15K and $35K to train a recruit in T+X ratings
  - Approximated by student salaries
  - Using time to train from CNA's Street-to-Fleet data and class sizes

- We age inventory and estimate the number of man-years saved because of T+X
  - Continuation rates from before and after 2008 to reflect economic conditions

CNA

We performed a man-year analysis to estimate how many man-years are saved by lengthening obligations and how much money these man-years would have cost the Navy. Because sailors spend more time in the Navy, fewer of them need to be recruited and trained. This is the logic behind the following analysis.

We used the PRO model used by the Navy Recruiting Command (NRC) to estimate a $13,000 cost per A-cell recruit. This includes the money spent on recruiters, bonuses, and advertising. It is much lower than in prerecession years (about $25,000 in 2008) because recruiting high-quality sailors got easier and the educational benefit changed from the Navy College Fund to the GI Bill, which is budgeted through the VA.

Next, we estimated the cost to train a sailor in the T+X ratings. CNA's NITRAS-based Street-to-Fleet file gave us the length of each training pipeline. From the EMR, we obtained the initial paygrade distribution for sailors in each rating. Based on the military pay chart, we were able to calculate how much students in T+X ratings are getting paid, which is the main variable cost of training in these ratings.

We age the FY12 starting inventory 20 years based on sets of continuation rates before and after the recession. By changing the year in which T+X sailors come up to EAOS, we compute the added man-years that the Navy collects as a result of T+X. We assume that the same people who would have left at the end of a4- year obligation would leave at the end of a 5-year obligation, so we simply delay the loss rate without changing attrition rates. From that, we compute how many fewer sailors the Navy must recruit and train. This number, along with the recruiting and training costs, gives us an estimate of the total savings associated with changing these 4YO ratings to 5YO.

T+X analysis: potential savings* analysis

Rating	Good Economy		Bad Economy	
	Man-years saved	Savings	Man-years saved	Savings
AO	36	$ 1,730,307	31	$1,098,440
EMSW	14	$ 774,481	1	$ 24,918
GSE	3	$ 147,299	1	$ 32,207
QMSW	9	$ 422,100	8	$ 284,079
ABE	23	$ 954,505	15	$ 466,014
ABF	15	$ 634,086	14	$ 407,548
ABH	37	$ 1,524,612	31	$ 907,448
AME	7	$ 382,244	6	$ 219,505
BM	13	$ 555,770	15	$ 471,777
GSM	10	$ 461,698	4	$ 143,451
MMSS	4	$ 215,795	6	$ 254,527
MMSSW	3	$ 193,111	3	$ 137,395
OS	25	$ 1,184,316	27	$ 931,820
SH	7	$ 267,625	9	$ 264,153
CSSS	4	$ 183,729	4	$ 145,525
CS	24	$ 988,230	26	$ 771,769
LS	23	$ 989,437	24	$ 739,305
LSSS	1	$ 60,012	1	$ 54,630
Total	258	$11,669,357	226	$7,354,511

CNA *This analysis includes only savings associated with longer obligations in the selected ratings. It does not take into account potential costs of extending obligation.

We provide two sets of estimates for potential savings resulting from the T+X program. The first, labeled "Good Economy," is based on recruiting costs and continuation rates before the current economic recession. Because it was more expensive to recruit and retain sailors in good economic conditions, the Navy saves more man-years and more money given this set of variables. We estimate that, in these 18 ratings, the Navy will have to recruit 258 people fewer per year, and this will result in savings of about $11.67 million. Under conditions of a "Bad Economy," because sailors are easier to recruit and less likely to leave the Navy, we estimate the benefit of extending obligation to be lower. Under high unemployment, the Navy should expect to recruit 226 sailors fewer per year in these ratings, resulting in savings of $7.35 million. Of course, these savings are just those resulting from recruiting and training fewer people. This analysis does not estimate other savings of the T+X program, such as those resulting from having fewer gaps at sea or fewer PCS moves. Note that this is a *benefit* analysis only. As the economy recovers, some of these savings will become offset by the costs to the Navy associated with recruiting to longer contract lengths, such as Enlistment Bonuses. This analysis also assumes that the extra year of obligation has no effect on attrition.

Issues with current data

- *Observational studies rather than controlled experiments*
  - Endogeneity problems
    - Previous across-the-board changes reflect a queue of qualified people
    - Incentives often given as a result of poor recruiting conditions
  - Interdependence of incentives
- Problems with missing data
  - Options offered to sailors are not available (ratings, contract lengths, ship dates, incentives, recruit preferences)
  - Unknown processes to persuade recruits to change rating / ship date
  - Classifier effects are not measured / modeled
- Process variability
  - Recruits do not necessarily ship in their original rating or ship date assignment
  - Recruits aren't always offered the right incentive
- We can take advantage of changing economic conditions to create external validity through a randomized experiment.

CNA

As we analyzed T+X data, especially those on increasing contract lengths in the accompanying report, the shortcomings of existing data became apparent. There are big problems that no degree of statistical analysis can properly address, and they limit the parts of the analysis that aim to estimate the cost per recruit of an additional year of commitment. We outline some problems here and offer recommendations.

One problem is the observational nature of the data. Many analyses, including ours, have tried to establish a causal link between monetary incentives and the probability of enlistment, its length, and the choice of rating, but this is difficult in the absence of a well-designed randomized experiment. The data have many endogeneity problems. Bonuses are issued when the economy is good and recruiting is difficult; obligations are increased for popular ratings that have qualified/available people. One cannot tease out effects of bonuses and obligations from these other influences.

A related problem is missing information. We cannot estimate effects of bonuses or contract lengths if we don't know what options the sailor had. We are left with his choice and extremely imprecise processes to identify his options. We realize that the classifier plays an important role in the recruit's choice of rating. Without properly controlling for classifier effects, we cannot reliably estimate policy results.

Another issue is process variability within/between Military Entrance Processing Stations and over time. The Navy's and recruits' needs are weighted differently at different times. There is also variability in how a recruit is offered incentives, whether they are the right incentives, and whether a recruit's choices materialize.

All these shortcomings define a clear need for a proper randomized experiment to inform future policy changes. Given the changing economic climate, such an experiment would allow us not only to collect much-needed data on the effectiveness of incentives but to do so under varying economic conditions.

Most effective pilot: a controlled experiment

- *Randomization is key to straightforward and unbiased analysis*
  - Endogeneity / independence
- *Quality / process control would resolve the rest*
  - Randomization of options offered to sailors
    - Ratings
    - Contract lengths
    - Incentives
    - Ship dates
  - Classifiers would follow a streamlined process in offering these options
  - Options presented to each recruit would be recorded
  - Measurement error would decrease
- What would have to be randomized?
  - Matched sets of ratings
  - Matched sets of Military Entrance Processing Stations (MEPSs)
  - Incentives / order of offering
- We need to ensure a wide range of options offered to have better informed estimates of the taste distribution

CNA

In the 1980s, RAND designed and analyzed the Enlistment Bonus experiment for the Army to evaluate the cost of an extra year of a recruit's commitment. This kind of a study—one that is well designed with respect to balancing important characteristics—is key to obtaining estimates of policy effectiveness. First, random assignment of incentives would greatly reduce, if not eliminate, the endogeneity problem in the current data. The incentives presented to the sailor would be random and thus independent of outside conditions and each other. In addition, quality and process control would need to be in place for the classification process, which currently is quite variable. Anecdotal evidence and our own observations point to the variability in which options are presented to recruits. Our visits to MEPSs showed that time constraints, as well as consideration of Navy needs and candidates' interest result in this large variability in the classification process. While classifiers' discretion in offering recruits only a subset of ratings for which he may be eligible makes sense on a practical level, from an analytical point of view, it results in missing data points. By imposing controlled processes, we eliminate the classification process as a possible cause of changes in sailors' behavior in response to policies. As part of the process control, we propose careful recording of the options presented to the recruits, so that we can make precise inferences about their taste distribution by knowing what their choices were as well as what they ultimately picked.

This experiment would require geographic randomization, as well as matching MEPSs and ratings to create control and treatment groups. Incentive offers would have to be randomized for different sailors. To have a well-informed taste distribution, the options offered would need to vary widely in range.

Experiment ideas

- Experiment with pricing / bidding / auctions and Enlistment Bonuses
  - $X for 4YO
  - $X+Y for 5YO
  - $X+Y+Z for 6YO, etc.
  - Or could change bonus over time

- Develop a taste distribution
  - Push obligation to the limit
    - Especially in the face of increased carrier presence
  - Shorten obligation length
    - Wouldn't cost anything up front

- Feasibility of our randomization ideas
  - Most interventions will probably be unacceptable despite a successful Army experiment in the 1980s

CNA

Because our accompanying analysis suggests that Enlistment Bonuses (EBs) are the most flexible way to encourage recruits to lengthen their obligations, our first experiment idea is to precisely evaluate the effectiveness of EBs. We propose a design, similar to that in the RAND Enlistment Bonus experiment, where increasing sums of money are offered with increasing obligation. Alternatively, the options don't have to be offered all at the same time, but perhaps the bonus and enlistment length can change together over time. This approach would give us data sufficient to put a price tag on recruits' taste for longer service. In fact, using this approach, we could push the obligation to its legal limit of 8 years rather than sticking with the common 4- to 6-year contracts. In addition, we could look at shortening obligation length at no upfront cost.

We finish our subsection on ideas for experiments with the acknowledgment that, in practice, our proposed interventions in the recruiting business rules will probably be deemed too disruptive to be used by the recruiting components of the Navy personnel supply chain. With that in mind, we propose several other ideas. Though they wouldn't correct the problems we currently have with our data, they may provide other useful insights that, coupled with our analyses, will be more informative to Navy leadership.

Other ideas

- Experiment with an EB menu for various obligation lengths
  - Similar but more detailed than Enlistment Bonus for Extended Enlistment (EBEE) (2004–2006)

- Experiment with extensions
  - Offer extensions after 2 years in the Navy instead of an EB *to those who qualify*
  - Can use our knowledge about Selective Reenlistment Bonuses (SRBs)

- A lab experiment / conjoint analysis may also be okay
  - Conjoint analysis recently done for the NRC but wasn't designed to give the estimates we are after

- Use Fleet RIDE data to backfill missing fields
  - MEPS visits showed that this isn't a viable option because classifiers only present a subset of options that fill Navy needs and sound appealing to the recruit

CNA

First, we propose a "natural" experiment similar to the one between 2004 and 2006 in the nine ratings eligible for EBEE. This program offered a $5,000 bonus to sailors in exchange for extending initial obligations from 4 years to 6. A more detailed menu of options (e.g., a set of packages of the form *rating + obligation + bonus)* could help us get closer to the recruits' taste distributions. This approach is relatively riskless; the voluntary nature of these options should not adversely affect recruiting.

Next, we propose experimenting with extensions vice enlistments. The Navy could offer 4YO sailors 1- and 2-year extensions with a bonus after 2 years of service. The advantage is that it doesn't require interference into the recruiting process but still offers 4YOs the chance to extend obligations for a bonus. We could use our existing knowledge of SRBs to start pricing these bonuses. Also, there would be a savings associated with offering this bonus only to sailors whom the Navy wants to keep.

If we wanted to go back to the recruiting end of the supply chain, we recommend that the Navy consider surveying recruits after MEPS processing. Such a survey may be too intrusive in the recruiting process, so a version of this approach would involve a lab experiment, perhaps with a conjoint analysis of options for potential recruits. It would, however, be difficult to ensure that the sample of people in the experiment is representative of the population of potential Navy recruits. Such an analysis was done in 2009 for NRC, but it wasn't designed to provide the estimates we need.

We considered using Fleet RIDE data to backfill recruits' choices since the RIDE program was designed to show what a sailor is qualified for in a rank order based on Navy needs. This sounded promising at first, but our visits to the MEPSs revealed that classifiers are not familiar with Fleet RIDE and don't use it for its intended purposes. Thus, getting RIDE data is unlikely to help us infer what options the sailor received.

Conclusions

- There is substantial loss due to the mismatch between initial obligation lengths and prescribed sea tour lengths
- Increase in first-term contract lengths should help sea tour completion
- The T+X pilot is too recent for in-depth analysis, but so far we haven't seen drastic changes in the ratings' accessions or attrition
- We forecast a savings of $7.35M to $11.67M per year from T+X depending on economic conditions, not taking costs into account
- To properly examine the potential recruits' taste distribution for longer obligations, we propose a controlled experiment as well as alternatives that require less intervention. Among them:
  - Quasi-experiment
  - Survey
  - Lab experiment
- Either way, we want to take advantage of the opportunity to pilot test programs as the economy recovers

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In conclusion, we found a substantial inefficiency due to the mismatch between first-term contract lengths and PSTs. Most sailors are simply not set up by the Navy to complete their first operational tour. Increasing initial obligation is likely to result in higher first-sea-tour completion rates as long as attrition does not rise.

The T+X pilot was designed to align sailors' PST, PRD, and EAOS. Although there are still some compliance issues, and we expect there to be some future mismatches, T+X sailors are more likely to finish their sea tours because, for many of them, the three variables align well. So far, we haven't seen any red flags for recruiting or attrition in the T+X program. Over the course of the next 20 years, our rough estimates suggest a large savings possibility of $7.35 million to $11.67 million per year, depending on economic conditions, as a result of extra man-years achieved by lengthening obligation in T+X ratings. Although the T+X pilot is providing some information on the effects of increasing contract length in a bad economy, a carefully planned experiment as the economy recovers would give us much-needed data to help estimate the effects of incentives on enlistment probability and contract length. We describe several ideas for such an experiment as well as alternatives that would be more easily implemented.