NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

ON RECRUITING: A MULTIVARIATE ANALYSIS OF MARINE CORPS RECRUITERS AND THE MARKET

by

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March 2018

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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 2018	**3. REPORT TYPE AND DATES COVERED** Master's thesis	
4. TITLE AND SUBTITLE ON RECRUITING: A MULTIVARIATE ANALYSIS OF MARINE CORPS RECRUITERS AND THE MARKET			**5. FUNDING NUMBERS**
6. AUTHOR Daniel Sanchez Jr.			
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) Marine Corps Recruiting Command USMC Recruiting Command, 3280 Russell Road, VA 22134			**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 # NPS.2018.0016-IR-EP5-A			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.			**12b. DISTRIBUTION CODE**

13. ABSTRACT (maximum 200 words)

Changes to recruiting capacity have strategic implications, as the consequences affect national security. Maintaining the correct number and quality of recruiters is paramount. Persistent low unemployment rates and low populations of military-age youth eligible or willing to serve combine as an existential threat to All-Volunteer Force (AVF) recruiting for the United States Marine Corps (USMC). The USMC should anticipate an increasingly difficult recruiting environment through the 2020s. This thesis analyzes the recruiting environment with a focus on the saturation of the market of potential enlistees and recruiters from 2007 to 2017. The data are comprised of 344,469 enlistments in 132 recruiter months and 528 recruiting station years. Three recommendations result from this study. The quantitative recommendation developed in this thesis is to add approximately three missioned canvassing recruiters per Recruiting Station, or 144 total, where the marginal cost of the 1,400 potentially gained contracts is the most economical manpower solution to increase high-quality contracting. The analysis reveals a quantitative and qualitative information gap and drives the second recommendation of creating an assessment tool. This tool affords leaders in the Fleet the ability to identify and flag Marines who display innate sales skills attributes via the recommended Marine On-Line (MOL) Recruiter Referral (R2). The third qualitative and low-cost recommendation is to add enriched as a recruiting duty description across the force. Enriched is a proactive description of the job of a recruiter and should expand the dialogue of recruiting duty as personally and professionally enhancing. This slight change in wording may reinvigorate self-selected and intrinsically motivated recruiting duty volunteers.

14. SUBJECT TERMS Marine Corps, recruiting, multivariate analysis, saturation, matching, AVF, strategic HR			**15. NUMBER OF PAGES** 111
			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. 289)
Prescribed by ANSI Std. 239–18

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ON RECRUITING: A MULTIVARIATE ANALYSIS OF MARINE CORPS RECRUITERS AND THE MARKET

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
March 2018

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ABSTRACT

Changes to recruiting capacity have strategic implications, as the consequences affect national security. Maintaining the correct number and quality of recruiters is paramount. Persistent low unemployment rates and low populations of military-age youth eligible or willing to serve combine as an existential threat to All-Volunteer Force (AVF) recruiting for the United States Marine Corps (USMC). The USMC should anticipate an increasingly difficult recruiting environment through the 2020s. This thesis analyzes the recruiting environment with a focus on the saturation of the market of potential enlistees and recruiters from 2007 to 2017. The data are comprised of 344,469 enlistments in 132 recruiter months and 528 recruiting station years. Three recommendations result from this study. The quantitative recommendation developed in this thesis is to add approximately three missioned canvassing recruiters per Recruiting Station, or 144 total, where the marginal cost of the 1,400 potentially gained contracts is the most economical manpower solution to increase high-quality contracting. The analysis reveals a quantitative and qualitative information gap and drives the second recommendation of creating an assessment tool. This tool affords leaders in the Fleet the ability to identify and flag Marines who display innate sales skills attributes via the recommended Marine On-Line (MOL) Recruiter Referral (R2). The third qualitative and low-cost recommendation is to add enriched as a recruiting duty description across the force. Enriched is a proactive description of the job of a recruiter and should expand the dialogue of recruiting duty as personally and professionally enhancing. This slight change in wording may reinvigorate self-selected and intrinsically motivated recruiting duty volunteers.

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LIST OF ACRONYMS AND ABBREVIATIONS

Alpha	enlistee with an ASVAB score above 50
AFQT	Armed Forces Qualification Test
APR	Average Production per Recruiter (Monthly)
ASVAB	Armed Services Vocational Battery
AVF	All-Volunteer Force
Bravo	enlistee with an ASVAB score below 50
EAS	End of Active Service
FFRDC	Federally Funded Research and Development Centers
HQMC	Headquarters Marine Corps
HR	Human Resources
HRDP	Human Resource Development Process
HSSR	high school senior
HSST	HQMC Special duty assignment Selection Team
MCRC	Marine Corps Recruiting Command
MCRISS	Marine Corps Reporting Information Support System
MEPS	Military Entrance Processing Station
MOL	Marine On-Line
PCS	Permanent Change of Station
Pros & Cons	Proficiency and Conduct Marks
R2	Marine On-Line Recruiter Referral
RELM	Reenlistment Extension Lateral Move
RoP	Recruiters on Production
RS	Recruiting Station
RSS	Recruiting Sub-Station
TFDW	Total Force Data Warehouse

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ACKNOWLEDGMENTS

Continuation of the legacy of the outstanding men and women who have gone before me to advance the Marine Corps depends on young men and women who are still in high school, small children, and many not yet born. A few will grow into brave souls and earn the right to call themselves Marines.

Marine Corps recruiting, while it is timeless, is also time critical. Front and Center—it is the sustenance for the Marine Corps' survival. This thesis is dedicated to the memory of Master Sergeant Kenneth B. Johnson, Recruiting Sub-Station Commander, Westbank, Recruiting Station New Orleans, 6th Marine Corps District, Eastern Recruiting Region, Marine Corps Recruiting Command. Known by Marines as "Top" and by friends and family as "Kenny," Top Johnson was a loving husband and father. Top took the recruiters in his office—Gunnery Sergeant Chisholm, Staff Sergeant Sullivan, Staff Sergeant Robinson, Sergeant Broussard, Sergeant Bonner, Sergeant Barrett, and Sergeant Sanchez—under his wing. New Orleans was a culture shock for me, and Top inspired my learning and adaptation. Rejection appears as a cursory mention in most writing about recruiting. Top also knew that challenge, but defeated that enemy every time. He made us feel invincible.

The *Best-Bank*—I still carry that pride and sense of accomplishment. There are communities and housing projects I would have never considered entering, but eventually I did because of Top's leadership. He never let me forget, "There's quality in there…maybe only one, but he or she will be a Marine and this community—they will remember the Marines were here. That's your mission," and we found them. Top was killed while on recruiting duty six months after I departed. My analysis reflects personal experience by a posteriori knowledge of having actually served as an enlisted canvasing recruiter.

I cannot offer enough gratitude to my advisors, Dr. Chad Seagren and Dr. Tom Ahn. The helpful and patient staffs at MCRC G-3 Operations, TFDW, and MMEA-25 were critical to this study. My intent is to advance Marine Recruiting and increase efficiencies for the recruiters on duty today to secure our Marine Corps for tomorrow.

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I. INTRODUCTION

This thesis develops recommendations for the optimal number of Recruiters on Production (RoP), given the U.S. Marine Corps' (USMC) share of the target population for enlistment. Marine Corps Recruiting Command (MCRC) historically achieves sufficient enlistments by measures of both quantity and quality. To meet the challenges of changing demographics this thesis recommends increasing the number of RoP prior to 2020 along with a method of reinvigorating recruiter selection and recruiting duty volunteerism. The goal is to increase capacity and efficiency via minor adjustments to existing recruiting manpower planning while avoiding major changes to structure or policy.

This study reveals a challenging forecast for the All-Volunteer Force (AVF) recruiting environment. Among the challenges in military recruiting is adapting to the market and anticipating change. The solution to recruiting in a labor-scarce market requires creativity when seeking efficiency, given inflexible budget constraints (Asmus, 1996). Each recruiter course graduates and assigns approximately 250 new recruiters to 250 assignments, resulting in 62,500 potential combinations of assignment. MCRC presently assigns recruiters without the use of tools meant to forecast each recruiter's probabilities of success. This is an opportunity to increase efficiencies with minor changes in order to gain recruiting contract volume and quality by matching recruiters to the markets analysis predicts as their best fit. Better matching recruiters to markets can offer a short-run solution to increasing recruiting intensity until the aggregated number of RoP can increase.

The Marine Corps assigns the approximately 2,346 recruiters to specific land areas of responsibility for contracting. MCRC apportions areas according to the various sizes and population densities of the approximately 41,000 U.S. zip codes (MCO 1130.56D, 2009, MCO 1130.76D, 2017). Some areas are population dense and cover a small land area. Recruiters may have longer distances to travel if assigned to sparsely populated regions such as the Great Plains. Recruiter areas will vary in their ratios of recruiters to the prime market of non-institutionalized military-age individuals potentially eligible for enlistment—referenced as *saturation* in this study. An example of a population-saturated

area is Recruiting Sub-Station (RSS) Manhattan with approximately 17 square miles of territory and an estimated population of 55,817 potential enlistees. The other end of the spectrum is RSS Fargo with approximately 81,832 square miles of territory and an estimated population of 40,192 potential enlistees. The study accepts that population counts are not direct translations to propensity or quality markets.

MCRC's policy options lie in advertising, recruiter selection and assignment, number of Recruiters on Production (RoP), and days in the Delayed Entry Program (DEP) prior to bootcamp. Creativity is the limiting factor in finding possible solutions to increase efficiencies (see Figure 1). This thesis attempts to answer the problem statement beyond a singular number of recruiters required to reach optimality by finding optimality according to the type and mixture of recruiters into the markets available. The intuition of the study is finding a method of categorizing recruiters, displaying differences in productivity after observed production, according to market saturation compared to their pre-recruiting duty attributes. A basic production function is a quantity produced as the result of various inputs. Economics and accounting theory suggests at least three basic means of increasing or decreasing production by varying the quantities of inputs, changing the mixture of inputs, or both.

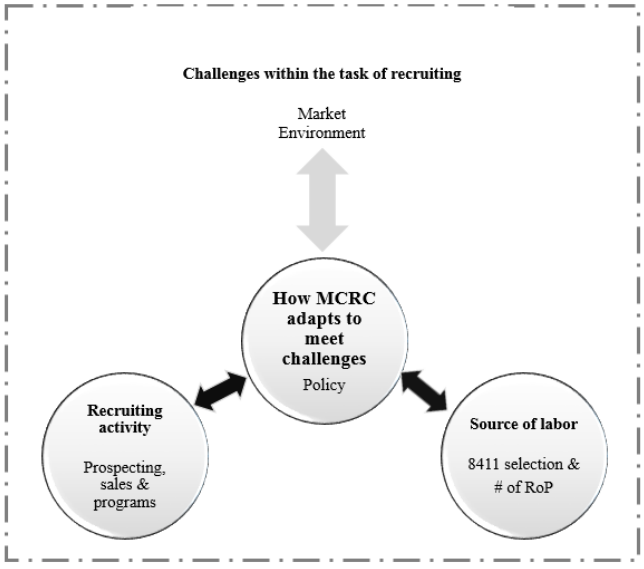

Figure 1. MCRC spheres of policy and influence.

The study uses a generic form of the production function in the analysis (Borjas, 2010). The function represents the Quantity (Q) produced as a function (f) of Labor (L) and Capital (K). The simplicity of the formula allows for solving of labor or capital.

$$Q = f(L, K)$$

The focus is labor and the reason for selecting this formulation as the basis for the thesis solution. Rather than limit the method of increasing the quantity of enlistments by manipulating the Labor (recruiters) as a monolithic input, the study sorts the data into two components: the markets by levels of saturation of recruiters to military age youth by area, and pre-recruiting duty information about each recruiter. The study divides the two components into quartiles for regression analysis. Each saturation quarter is membership within the (0%–24%, 25%–49%, 50%–74%, and 75%–100%) according to population counts and persons per square mile at the RSS and RS level. The study quarters the four pre-recruiting assessments: AFQT, physical fitness test, marksmanship, and proficiency and conduct marks, in the same manner (see Figure 2). The result is an intentional recruiter market-match.

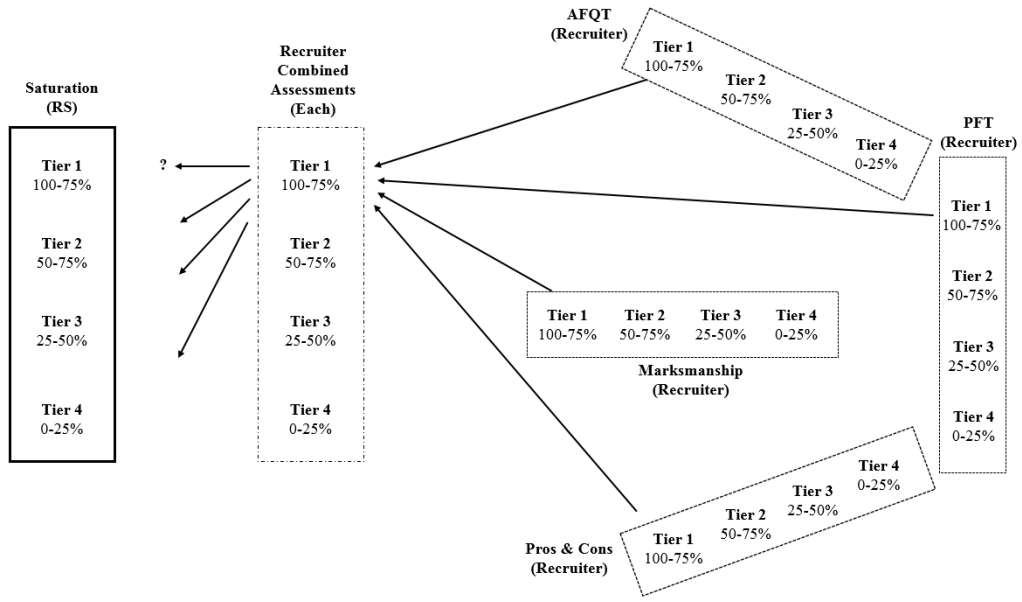

Figure 2. Market-matching recruiters

Finding improvements in Marine Corps recruiting is challenging as MCRC is exceptional in peer comparison and leading a well-built organization charged with recruiting, "the nation's force-in-readiness" (Marine Corps Doctrinal Publication 1 [MCDP-1], 1997, p. 27). This analysis dissects the question of what recruiting is by exploring the qualities and characteristics of the production function inputs and goes beyond recommending an aggregated number of RoP. The result of such a production function can vary according to the labor and capital inputs available (recruiters) in varying conditions or combinations (market saturation).

How does recruiter productivity vary with market saturation? The study uses quantitative statistical analysis reinforced with qualitative analysis. Enlistment is a choice unique to each person. The decision to enlist adds variables difficult to aggregate and exacerbated by the reality of not having data for every facet to analyze. Recruiter productivity does appear to vary by market saturation but not at a level of statistical significance with the data available. The secondary questions of this thesis are:

(1) How does productivity and quality vary with changes in recruiter-to-enlistee match?

(2) How does performance vary with changes in pre-recruiting duty assessments?

The activity of prospecting is an important component of recruiting where the operational tempo for the recruiter is significantly different from what most Marines are accustomed to in the Fleet. Recruiting duty is an independent duty and the challenges demand a Marine of exceptional character and competence where leadership enables the recruiter.

A. SCOPE AND METHODOLOGY

The study uses a macro-approach of statistical analysis to determine the optimal number of recruiters on production in consideration of the market from FY18 to FY22. The study first analyzes the data via simple visual plot analysis using analysis from aggregated recruiting force trend-lines without regression (see Appendix B, Data Graphics) followed by analysis using linear and logistics regressions. The recommendation for the number of

recruiters result from a production function utilizing coefficients from regression analysis. The data in this analysis come from enlistments spanning FY2007 to FY2017 via the MCRC G-3 Operations section and the USMC Total Data Force Warehouse (TFDW).

B. ORGANIZATION OF THE STUDY

Chapter II provides a background to Marine Corps recruiting, Marine Corps Recruiting Command, and challenges. Chapter III provides the literature review of research and concepts relevant to this study of AVF recruiting with a focus on Marine Corps Recruiting. Chapter IV describes the data and methodology. Chapter V provides the results of the analysis. Chapter VI presents conclusions, recommendations, and topics for further research.

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II. BACKGROUND

This chapter explains the background for the study by orienting the components of recruiting in relation to each other: the concern, the structure of MCRC, the market environment, and future challenges. The components of recruiting are either capable or not capable of change as a variable. The focus of the thesis fits within the feasible solution framework available to MCRC. The study includes a familiarization of the market conditions of the past 30 years.

There is value in understanding demography and the effect on recruiting from small birth cohorts. The primary market for the USMC is the 17-to-19-year-old cohorts. The 1975 to 1977 birth cohorts were the smallest on record to that point with respect to nativity rates for military recruiting when considering recruiting for the USMC in 1995. Those born on or around that time would have reached age 18 years between 1994 and 1996. Given that is the MCRC primary market and so few were born, 1995 would have been a challenging year for MCRC. The 1975 to 1977 cohorts aged into to the 20- to-24 year-old range between 1997 and 2000 when the Army, Navy, and Air Force struggled with recruiting. Other analyses offer explanations and correlations that are less supply-focused (Warner, Simon, & Payne, 2003).

Generation Z (unnamed at that point), and the last of the Millennials, have birthrates lower than the 1975 to 1977 birth cohorts even though their population counts are larger. MCRC knows the number of people born each year and while this number is out of scope of manipulation, cohort populations afford planning opportunities. The unemployment rate is also out of scope for MCRC policy manipulation. The number and quality of recruiters in the market is within MCRC's scope of control. MCRC can possibly leverage additional gains in the recruiting force if recruiters are also market-matched to their individual ideal area. The labor market appears to remain on course as thin without relief for as long as a decade. Fixed or semi-rigid production functions may lack the capacity to produce in adequate quantity and quality if the raw input supply increases in scarcity and cost. Schweyer states, “a near unanimous belief among government, academia, and other analysts that a labor shortage is looming, and it will begin in the next few years, gradually

worsening through at least 2030" (2004, p. 26). Schweyer is correct thus far and between now and 2030 is a long time to endure.

Low or decreasing national unemployment rates correlate to difficult USMC recruiting years such as 1995 and 2005. One possible cause may have been the under-saturation of recruiters in the 17-to-19-year-old prime market. The correct solution is increasing recruiter saturation in the market during austere conditions. The result of raising the number of recruiters on production by MCRC is making mission afterward in those tough years. This is important as the current low unemployment rates have not increased to afford more slack in the recent past (Bureau of Labor and Statistics [BLS], 2018). An increase of recruiter saturation before 2020 anticipates a historical problem of missing mission when unemployment rates fall. Unemployment rates that remain low for prolonged periods may create a repeat or even worse recruiting environment like 1995 and 2005. The demographics of the aging population and possibility of further decreases in the unemployment rate are concerning. The recommendation is to lean forward and anticipate unprecedented levels of AVF recruiting austerity with an increase of approximately 144 more recruiters.

A. STRUCTURE

The Commanding General of MCRC is a Major General (O8) located in Quantico, VA, and is responsible for the entirety of the force and mission (MCO 1130.76D, 2017). The continental United States is further broken down into the Eastern and Western Regions, each commanded by a Brigadier General (O7) who also commands the Marine Corps Recruit Depots (MCRD) Parris Island, SC, and MCRD San Diego, CA, respectively. The Eastern Region is comprised of three districts capturing several states within the 1st, 4th, and 6th Districts, each commanded by a Colonel (O6). The Western Region is comprised of three districts in similar fashion: 8th, 9th, and 12th Districts, also commanded by Colonels (see Figure 3). There are eight Recruiting Stations (RSs) per district, totaling to 48 RSs (see Figure 4). Board-selected Majors command at the RS level. Each RS is further broken down to approximately 12 Recruiting Sub-Stations (RSSs). There were 583 RSSs within the timeframe of this study.

Figure 3. Structure. Source: Munoz (2005).

The regional commanders assign recruiters by fair-share to district commanders who then fair-share recruiters to RS commanders. Each RS commander assigns Marines with the underlying goal of each RSS manned to 100%. There are approximately 2,936 Recruiters on Production (RoP) assigned in distributed operations across the country to include coverage of American Samoa, Guam, the Federated States of Micronesia, the Northern Mariana Islands, the Marshall Islands, Palau, Puerto Rico, and the Virgin Islands.

MCRC assigns individual monthly mission goals to the approximately 2,300 RoP on production within their assigned areas to recruit. The study refers to missioned recruiters on production as *missioned canvasing recruiters*. The recruiter's immediate leaders or Staff Non-Commissioned Officers-in-Charge (SNCOICs) are accountable for their overall team performance and not usually on production as an individual recruiter. There is some variation from small RSSs with one or two recruiters to larger RSSs with three or more. Large stations with more than six recruiters are not common. An Enlisted canvassing recruiter, military occupational specialty (MOS) 8411, a career recruiter (8412) can lead

an RSS. Career recruiters possess additional training and greater experience. There is a significant amount of depth to the career recruiters in MCRC. Asmus (1996) writes about successful RSs, stating, “The RS table of organization calls for approximately 15 percent of the 8411 and 8412 population as career recruiters to ensure a consistent base of experience present in the station to combat personnel turnover” (p. 15).

The assignment of geographic areas and the requisite manpower strength (Table of Organization or T/O) to adequately recruit within the aforementioned assigned areas or ground is regularly reviewed (Jareb, Parker, & Cardenas, 2000) by the National Structure Working Group (NSWG).

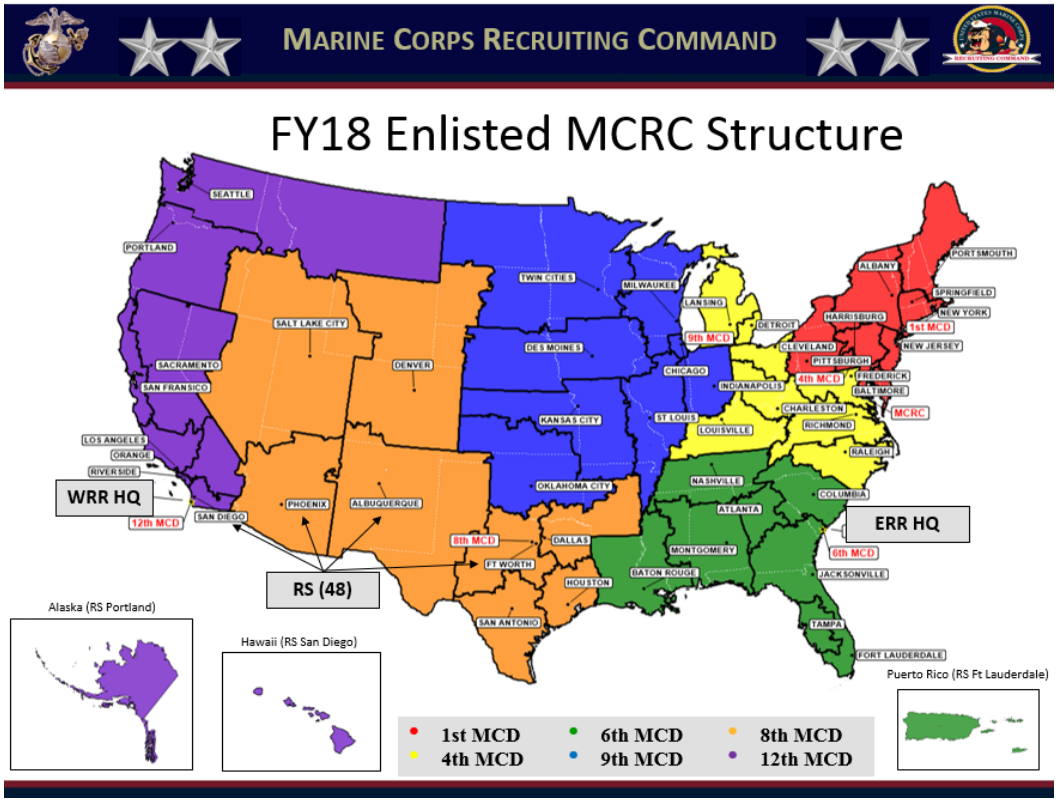

Figure 4. MCRC district and RS locations. Adapted from Marine Corps Recruiting Command, January (2018).

The current and exceptional form of USMC recruiting is designed to meet manpower needs previously sourced by the draft. Marine Corps recruiting is superior to the draft as volunteer recruiting results in higher quality enlistees. Brigadier General Bowers (2014) describes the leaders who implemented systematic recruiting across MCRC in "Making Marines in the All-Volunteer Era: Recruiting, core values, and the perpetuation of our ethos." Brigadier General MacMillan developed the USMC recruiting system within his sphere of influence and recognized by the 26th Commandant of the Marine Corps (CMC), General Wilson (1975 to 1979), and Major General Barrow. The experienced recruiters on staff are of great value but leadership is fundamental. This translates to a production need where a Marine equipped with the optimal set of innate and taught skills will still rely on his or her commander to succeed. RS CO selection and screening has proven highly successful in reducing leadership variance.

1. Human Resources

The Human Resource Development Process (HRDP) process of the USMC is a critical component of sourcing the labor for recruiting duty. The USMC is exceptional in the execution of *tactical* human resources (HR). The execution of HR in the USMC passes from cohort to cohort who ascend to become monitors, occupational field sponsors, and the various teams of experts at Headquarters Marine Corps (HQMC). HRDP must be considered in context of manpower management. The timing and movement of an individual Marine must fit within a larger context of meeting the needs of the Marine Corps.

Barry and Gillikan (2005) outline the HRDP to a succinct and understandable process of aligning the needs (spaces) to the Marines who will fill them (faces) to build readiness. The HRDP is a continual cycle of requirements (current and future needs), programming (funding constraints), planning (future), and manning (assignments of personnel) (see Figure 5). This is critical in understanding that the USMC does *hire* or enlist Marines for a prolonged probationary period or enlistment (Lazear & Gibbs, 2015, p. 31). Organizations incorporate new-hires (inexperienced) into the cycle of replacing promoted and relocated (experienced) past-hires. Marines that perform well are promoted and eligible for reenlistment.

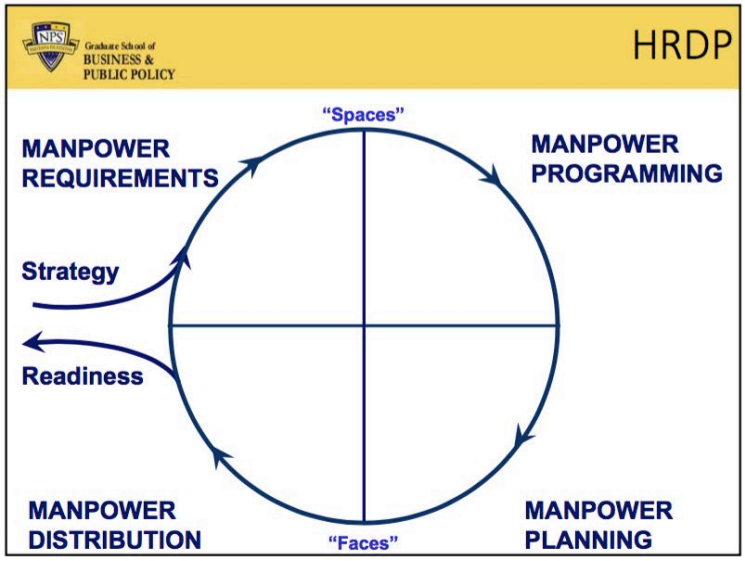

Figure 5. Human resource development process (HRDP). Source: Barry and Gillikan (2005).

2. Assignment to Recruiting

The Marine Corps assigns Marines to recruiting duty as the needs of the Marine Corps come first. Volunteers are usually preferred for any military or civilian job or task. A simplified economic Adam Smith interpretation of the labor market is that laborers take jobs by choice and in sufficient quantities to satisfy the total demand at the point of agreement, or equilibrium, where employers pay a wage commensurate with the job. The reservation wage is the minimum compensation the laborer requires in direct and indirect compensation, including consideration of individual value of leisure time, to compel the individual to enter the market for the wages offered (Borjas, 2010). An All-Volunteer Recruiter Force would theoretically require a market price capable of meeting the reservation wage for Marines to enter the market as volunteer recruiters. The USMC provides an intervention via HQMC Special Duty Assignment Selection Team (HSST) to avert a labor shortage or market failure of recruiters (MARADMIN 061/18, 2018). There are opportunities via indirect compensation in the recommendations of this thesis that may increase recruiting duty volunteerism and help the market clear in a more natural free-market where the MCRC demand for labor (recruiters) finds equilibrium with the supply of Marines with an entrepreneurial spirit seeking employment as recruiters (supply).

a) Selection

The current system of assigning recruiters utilizes the HSST screening method. First tour canvassing recruiters on production do the heavy lifting and perform the majority of the labor involved in recruiting within MCRC. Recruiter quality has consistently been sufficiently high and resulted in consistent mission accomplishment. One of the most important HSST screening inputs of what makes a Marine eligible for screening is timing within their current set of orders (MCO P1326.6D W/CH1, 1990). This is the reality of sourcing Marines. Each recruiter should be of a certain rank and age when they are in high demand and developing expertise in the Fleet. Said Marine must have enough time on station at their current duty station with enough time remaining on contract within the billets the monitors are trying to fill. The SDA monitors and the MOS monitors compete for manpower needs. This is a complicated task and leaves a narrow margin of who is available. Two practices revealed after analysis may offer opportunities to increase the quality of recruiters via a possibly improved method of sourcing recruiters with a discussion in the recommendations.

The SDA screening and Reenlistment Extension Lateral Move (RELM) Navy and Marine Corps (NAVMC) 11537 were converted to electronic copy during the course of this analysis (MCO P1326.6D, 2012). The value in explaining the screening process is relevant as it is a large component of the screening and quality assurance of recruiters. An SDA package requires approximately 24 working hours of collective work to route through a battalion (see Appendix A). The USMC invests time to ensure screening and retention is to the highest fidelity possible.

b) Recruiters

MCRC provides life to the USMC and excels in external-strategic HR via branding and advertising to the civilian market. This external strategic HR is the terrain MCRC shapes and creates for the recruiters to succeed. An inward look at the USMC's internal-strategic HR suggests there may be a benefit in expending more effort in recruiting recruiters. The Marine selected to be on independent duty as *the ambassador* of the USMC needs to be *semper fidelis* and armed with outstanding communication skills capable of

delivering 30-second elevator pitches at least 100 times per day where most result in rejection. Recruiting commanders and their recruiters face ceaseless friction in their mission as Clausewitz describes (1976, pp. 119–121). The ideal laborer in any production function is intrinsically motivated (Lazear & Gibbs, 2015). Recruiter selection is critical in ensuring endurance and discipline in overcoming continuous friction leading to success and advancing the USMC culture and reputation. Intrinsically motivated recruiters with the character and competence for recruiting duty are the *sine qua non* for optimal results.

3. Time

A critical element within the recruiting production function is time. The first timeframe considered in this analysis is the Planning, Programming, Budgeting, and Execution (PPBE) process. The second timeframe is the three to ten-year long-range plan at the HQMC level such as "Force 2025," a strategic plan of what the USMC is shaping itself to be, written by CMC. These plans incite dialogue and debate in order to find optimal solutions via the stakeholders with enough time in their careers to see the CMC's intent fulfilled. Other long-range planning to consider is at the MCRC, Regional, District, and RS level. Leaders at each level have time and space specific details that are responses to past performance and their individual plan to improve for the future. The increase of recruiters by 23% to support the USMC increase in end-strength to 202,000 is an example of planning beyond the year of execution (Hattiangadi et al., 2010, p. 42).

B. THE MARKET ENVIRONMENT

The total sum of enlistments is not limited to recent high school graduates but recent graduates do comprise the majority of USMC enlistments with a mean age of 18.8 years old according to the data of 344,469 observations of enlistment from 2007 to 2017 (TFDW, 2017). Each military service, colleges, trade schools, and the direct labor market seek labor from a shared and finite pool of persons where high quality is the ideal hire. The population of persons eligible for enlistment is restricted due to established standards for enlistment into any branch of service: mental, moral, and physical. Given that enlistment requirements are a condition of persons to recruit, 3 million or fewer males in the 17–21 age range may be qualified any given year.

Recent U.S.-born cohorts turning age 17 include approximately 2 million males (CDC, 2018) prior to disqualifications or self-selection into other opportunities such as college. The study includes observations of males and females where males represented over 92% of the enlisted force at the time of writing (Defense Manpower Data Center, 2018). Low unemployment rates and low per-capita populations of military-age youth eligible for service (Schweyer, 2004) combine to form an existential threat in recruiting an AVF Marine Corps.

Propensity to serve in the military shows an overall decrease without indications of stabilizing or increase combined with a high demand for the same quality of persons by non-military organizations (Asch et al., 2007). The literature supports a generally accepted 20% and decreasing proportion of military-age youth in the United States who are potentially qualified for military service (L. G. Shattuck, class notes, November 13, 2017). MCRC faces a challenging opportunity given a history of outstanding performance and producing at higher rates and quality than the other competitors in the market. The USMC seeks the best of the qualified.

Approximately 1.5 million males graduated high school in 2016. The National Center for Education Statistics estimated that 1,024,000, or nearly 68 percent, enrolled into two and four-year colleges according to the most recent data published (NCES, 2018). This subtotals to approximately 500,000 recent high school graduates whose eligibility for military service is unknown and who did not self-select into higher education immediately after high school. The 2018 military-age labor market demand is at least 330,000 new recruits from all branches of the Department of Defense (Comptroller-DoD, 2017). Additional competition from trade schools and the direct labor market quickly sums to a large number of youth in demand of the remaining 500,000 who are not college committed before accounting for the unmotivated (BLS, 2018). These are the conditions of a thin labor market.

The school year is another important consideration when specifically discussing the USMC market as high school seniors (HSSRs) are a significant percentage of enlistees, as much as 50%. A HSSR is eligible to enlist early as their senior summer when enough credit hours and good academic standing indicate he or she is on schedule to become a bona fide

high school graduate. An applicant with a high school diploma qualifies as an education Tier 1 enlistee. The education requirement does not include the Armed Services Vocational Aptitude Battery (ASVAB) which as a separate mental requirement. The Department of Defense (DoD) minimum requirement is that 90% of enlistees must have high school diplomas and 60% must be ASVAB CAT I-IIIA (ASVABAFQT $\geq$ 50) also referred to as *alphas*. The CMC requires 95% or more of enlistments as having high school diplomas and 63% or more as ASVAB-Alphas. MCRC produces above these already higher self-imposed standards by recruiting approximately 99% and 71%, respectively, in recent history (Kao & Desrosiers, 2017).

C. CHALLENGES

The conditions for *recruiting intensity* as described in the literature are restrictive for the military compared to private firms. Private firms can increase intensity by increasing wages or hiring labor while market conditions are cheap. Law requires the Marine Corps to be at a certain size each year thus MCRC cannot surge in size in years where recruiting may be easier. The law also restricts the manipulation of wages and benefits leaving MCRC a relatively fixed basket of wages and benefits with little room to customize or differentiate when compared to civilian recruiting organizations. The data and prior analyses are clear that attractiveness of military service in the USMC decreases with age. The choices, tastes, and preferences of potential recruits change with age while the goods or market basket of military service holds constant. An older and eligible person begins to invest in human capital development and therefore may have to forego higher wages or advanced skills development when considering the entry-level benefits of a four-year enlistment. The opportunity cost of enlistment increases with age.

Given that the USMC does not self-regulate the approved budget and advertising spending acts as a response to Congressional funding, MCRC must apply creativity to increase intensity. Matching comes from personality attributes and some discrete variables such as race, ethnicity, education level, intellect, and home state. Matching recruiters to markets predicted to be most successful is a creative solution to increase efficiency and intensity at low-cost with minor policy changes.

D. CHAPTER SUMMARY

The background of Marine Corps recruiting is time tested and utilizes a proven formula for success. The MCRC solution for attaining the highest quality Marines begins with selecting high-quality commanders and recruiters. The environment of recruiting is dynamic and subject to infinite inputs from the economy, competition, the quality of recruiters, and the tastes of military age youth. The chapter explains what is within and out of scope of the policies of MCRC in seeking high-quality enlistments. Though the market may change, the USMC will not compromise quality in recruiting. The history of the past few decades shows a potential risk of missing mission if too few recruiters are on production. Recruiters not assigned to their most opportune market might present unrealized gains for MCRC. Every enlistment counts and high-quality enlistees are the product of the most important input of the production function-the recruiter. Recruiter assignment is an integrated process within the HRDP of the USMC where opportunities to reinforce and optimize via market saturation analysis and recruiter market matching are developed in this thesis.

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III. LITERATURE REVIEW

Recruiting and reenlistments of the all-volunteer force have been the subject of many individual theses researchers at the Naval Postgraduate School (NPS) and Federally Funded Research and Development Centers (FFRDCs) such as the RAND Corporation and the Center for Naval Analyses (CNA). A literature review of the most relevant analyses follows where the intuition and logic of previous studies affords guidance in the problem-framing analysis of this thesis. The foundational study referenced to is the RAND "Human Resource Management and Army Recruiting: Analyses of Policy Options" (Dertouzos & Garber, 2006). The literature references for the study focus on military recruiting, the challenge of recruiting in the 1990s, Marine Corps recruiting, econometrics, the recruiting environment, and internal labor markets.

A. MILITARY RECRUITING

Dertouzos and Garber (2006) add to the literature of optimizing recruiting as it relates to human resource management. The study includes over 130,000 observations of Army recruiting data from 1998 to 2000 identifying several correlations where recruiter match to area is among the factors correlated to increased production for U.S. Army recruiters (2006, pp.112, 126–9). Similar attributes hold in USMC-related studies. The structure of U.S. Army Recruiting Command (USAREC) is different from MCRC where Marine recruiters have a larger scope of individual responsibilities though they compete with military service as a similar or substitutable good in the same market (Porter, 1979). Dertouzos and Garber (2006) note that males and unmeasured attributes have a positive effect on productiveness, AFQT is not significant, and logistic Military Occupational Specialties (MOSs) have a negative effect on productivity.

Dertouzos and Garber state, "only a small part of these differences can be predicted or explained by observable recruiter characteristics such as age, education, race, gender, occupational specialty, and assignment," with respect to above average recruiters (2006, p. 55). Much of the literature supports the difficulty in assigning causation to recruiting performance at the individual level. The knowledge gained from this study leads to

matching as important to analyze via demographics alongside recruiter quality and market saturation variables where high-quality enlistments are the response. Dertouzos and Garber (2006, pp.61–3) state there are a variety of approaches in using effort as a key input or explanation to recruiter productivity: equal effort across recruiters and stations or differing effort between recruiters and stations. Effort is a noisy variable to regress yet they do make some key points.

Asch, Hosek, and Warner (2007) provide a rich source of information via a literary map in their meta-reference of manpower economic studies and serves as a connection of the Dertouzos and Garber study to other research relevant to the intuition for this study. College as a choice over military service now trends over 60%, acting as a significant competitor for the target market (Asch, 1999). The study of the frequency of over-weight and disqualified military age adults by Cawley and Maclean (2010) note an increase of 131% for men and 270% for women when comparing USMC enlistment criteria of random samples from 1959–62 and 2007–08, respectively.

Asch (1999) explores the policies to increase enlistments in consideration of college as a main competitor. The study comes toward the end of the recruiting difficulty of the 1990s. The study states enlistments decrease with unemployment and critical to the inclusion of the health of the economy in this thesis. Asch (1999) also finds similar AFQTs for those who enlist or attend college and that the supply of youth does have an effect on enlistment. Among Asch's (1999) feasible and low-cost recommendations is to increase recruiter presence on 2-year college campuses. Asch acknowledges these same persons were likely contacted by military recruiters in high school but may reconsider enlistment with additional life experience after graduation (p. 38). This reveals an implied opportunity with respect to a renewed focus on prospecting high school graduates previously categorized as not interested and committed to college with a recruiter follow-up one to two years after high school graduation.

1. AVF Recruiting in the 1990s

National defense with a volunteer force requires recruiting activities where inefficiencies are costly and risk national security. Warner, Simon, and Payne (2003) study

the productivity of each services' recruiters from 1989 to 1997 and find that approximately 10–20,000 enlistees were collectively beyond the contracting capability of the services through the 1990s. The total sum of military recruiting approached the contracting goal but fell short by the aforementioned margin where recruiting increased in difficulty after the early 1990s. The likely cause is found to be the competing factors of increased demand for college and a decrease in veterans, specifically parental veterans as influencers (2003, p. 341). Unemployment is another key factor as it fell from 7.5% in 1992 to 4.9% in 1997. Of note, the national unemployment rate is 4.1% at the time of writing (BLS, 2018). Warner et al. state the U.S. Navy and Army attempted to influence the market during the study period by increasing advertising by three to four times previous expenditures.

There is evidence of overpayment in bonuses where approximately two-thirds of bonus-paid enlistees would have likely enlisted without payment. Better recruiting is determined to have resulted from less-dense populations. The USMC is the outlier in this study managing to discredit several theories with respect to pay inelasticity via relatively few bonuses, race, civilian markets, and comparisons to the other services.

> In contrast to the other services, the estimated time trend was positive for the Marine Corps. Just why the experience of the Marine Corps was so different from the other experiences of the other services is and avenue of future research. (Warner et al., 2003, p. 339)

The accompanying footnote to the above quote in the original document offers an interesting explanation and insight into opportunities for further development.

> The Marine Corps may have done well because it appeals to a limited number of recruits regardless of the health of the civilian economy. It may have not done as well if it had to recruit on a larger scale. The Marine Corps may also have responded to the recruiting challenges of the mid-1990s differently from the other Services. Marine LTG Carol Mutter [sic] informed us that, in the early 1990s, the Marine Corps began devoting much more attention to the selection and training of recruiters and it placed more emphasis on high-quality recruiting. (Warner et al., 2003, p. 339)

The second half of the footnote is brilliant as the quality of recruiters is *a fortiori* as to why the Marine Corps did well. The statement about the Marine Corps having to enlist a limited number or recruits could have been worded differently when considering

the USMC usually has the largest active duty-to-new recruit requirement. Warner et al. (2003) recommend increasing college programs, advertising, and recruiters when considering capital and labor as the major inputs to production. Dertouzos and Garber (2003) analyze the effectiveness of military recruiting advertising from the 1980s and 1990s and find that although different formulations and media approaches have varying effects, that advertising is cost-effective in generating leads and eventual contracts.

Warner et al. (2003) did not make a specifically strong case that the issue of the recruiting slow-down of the 1990s may have been partially due to a discrete supply shortfall of available youth as much as the slow-down is also a military effort or policy issue. Perfect supply in the AVF market is not a given condition as each enlistment increases the scarcity of the finite labor market (Asch, 1999). Peterson, Huff, and Quester (2013) study the AVF of the past 40 years and the DEP titled, "The Role of the Delayed Entry Program in Recruiting the All-Volunteer Force" and recommend the services "identify service members with the maturity, stability, and leadership necessary for recruiting duty" (p. 28). This analysis recommends and validates the USMC's approach to recruiting - putting the best and brightest on recruiting duty.

2. End-of-the-Month Recruiting

The activity and quality of enlistments observed at the end of the month is the subject of a number of studies where results vary. Arkes and Cunha (2014) highlight evidence of the probability of a Navy enlistee being of lower quality with respect ASVAB scores and what day of the month a Navy enlistment is contracted. The intuition is that the later in the month the enlistment, the likely increase in probability of the recruit having a lower ASVAB score. The Arkes and Cunha (2014) study does not find statistical evidence that end-of-the-month recruiting leading to higher attrition. The Arkes and Cunha (2014) study offers insight where studying USMC data and analyzing how many days before an event occurs such as a recruiter moving from zero to first contract relates to market saturation.

B. MARINE CORP RECRUITING

The Plantz (2000) thesis is critical in analyzing current USMC recruiting. The study analyzes recruiter background characteristics and market demographics at the county-level for Navy and Marine Corps recruiters between 1995 and 1999. The study analyzes previous recruiter selection models where each and finds younger and more junior in rank recruiters to be more successful while location and demographics, specifically high school seniors to have a small but significant effect. Plantz (2000) finds race to be insignificant and affirms causality cannot be assigned for any of the aforementioned attributes.

Jarebet al. (2000) explain the background, structure, and functions of the MCRC National Structure Working Group (NSWG). This study provides critical insight to the mechanisms of structure change in MCRC as an efficiency-seeking organization. Malone and Clemens analyze the effects of low- versus high-quality recruits on the readiness of the USMC in, "Cost of Recruit Quality" (2013). They state, "we cannot identify a systematic relationship between resource cuts and the mission-accession gap. In most cases, this gap simply does not exist." This is likely due to the tenacity of Marines who will *make it happen*. Mission accomplishment, when specifically analyzing recruiting, likely shows the same disconnects of success Marines produce in conditions of austerity when studying Marine Corps history.

According to Malone and Clemens (2013, p. 15), "each 10-percent change in the number of recruiters results in a 4 to 6 percent change in the number of high quality recruits." This is a significant return on investment and a relatively steep slope. Given the slope is positive, this means gains are possible and promising with an increase of a 50% return. Such results indicate the USMC may have been operating somewhere below the global optimum at the time of the study. Had the study revealed a much smaller gain such as 24 high-quality recruits in one month at the cost of 240 additional RoP months, then these smaller marginal gains indicate the optimal value is likely near the previous solution.

Malone and Clemens find that cutting recruiters and advertising has a *fault-line* effect as the two recruiting strategies complement each other. Cutting both creates a void where the literature and the study suggests the void fills with low quality recruits (2013,

p. 35). Malone and Clemens (2013) advise maintaining advertising and recruiter levels for the long run.

Malone and Clemens (2013) predict the USMC to miss the CMC quality benchmarks in FY 2017 yet it appears MCRC did attain its goals at the time of writing. This thesis finds similar results in the estimate of the future where the recruiting environment trends toward increasing difficulty in quality and quantity. Sustainment of the quality of the USMC was achieved in past but changes to the retirement system may affect recruiting with actionable feedback years into the future (Hattiangadi et al., 2010). Most operations do not succeed via extreme efficiency alone—mission accomplishment is what counts. Efficiency is a concern and paints in the hues of fiscal restraint therefore a balance must be struck but not at the expense of a lack of capacity where it is better to err on the side of caution with more recruiters.

General Krulak focused on RS CO selection quality as critical to the survival of the USMC where it has become a top assignment for Majors. The *surface* in reference to recruiting duty as it relates to Warfighting (Marine Corps Doctrinal Publication [MCDP]-1, 1997) is the skeptical prospect, difficult high school guidance faculty, an indifferent veteran, to the extreme contrast of opportunity via high school underclassmen wanting to join the Marines, appreciative parents, and resourceful high school guidance staffs. A recruiter's environment changes by the minute and person. The recruiter must be emotionally intelligent (EI) and capable of always projecting Semper Fidelis actions and behavior.

General Krulak writes about the "Strategic Corporal" and a "Three-Block-War" (1999). The same logic holds true for recruiters who also operate in a dynamic environment. Recruiting requires maturity, patience, self-leadership, time-prioritization, and above all adaptability. Every aspect of Marine Corps leadership skills and principles are tested and there is not a team to lean on—it is on each recruiter to accomplish the mission. Bing West highlights the importance of individual personalities and traits in "The Village" where assignment to the unique duty in combined action platoons in the hamlets of Vietnam had productive and long-lasting effects in fighting the Viet Cong (1972). Recruiters operate as immersed in communities in a similar manner.

The Marine Recruiter is the face of the Marine Corps and is much like the strategic corporal. Recruiting is challenging and considered the next hardest challenge outside of combat. Tremendous tasks are accomplished on recruiting duty and the best of America's youth will seek enlistment and accept the challenge if found and properly propositioned. Self-discipline and time investment (management) by a sound leader capable of self-leading away from direct supervision while exercising personality traits that may not come naturally are critical to making mission.

Baczkowski (2006) studies USMC bootcamp attrition in his thesis researching a link to higher rates of attrition stemming from enlistees who were end-of-the month contracts in a manner pre-dating the Arkes and Cunha (2014) Navy study. Baczkowski did not find a correlation to higher rates due to contract date. Different analyses arrive to different conclusion about attrition and quality with respect to timing of the month when recruiting.

A Command and Staff thesis by Randolph (2012) studied MCRC with a focus on the Basic Recruiters Course (BRC) and highlighted inefficiencies in personnel administration, no-shows to screening, no-shows to BRC, and inefficient SDA package screening. Another issue Randolph describes involves high aptitude Marines being *fenced* as too valuable and persons advocating for the removal of such Marines from the final list of potential recruiters. The Randolph thesis influenced the inclusion of recruiter attributes when studying market saturation. Griesmer (2006) offers two recommendations: everyone is responsible and to identify and send your best Marines to Recruiting Duty. The first is an outstanding declaration yet the second is not actionable. The Marine On-Line recommendation offered in the recommendations may however advance Major Griesmer's spirit and intent.

1. Leadership

Asmus (1996) highlights leadership and a positive climate with information sharing by RS CO's as the common denominator that differentiates successful RSs from the less successful. The Asmus thesis resonates within the leadership desired in the Marine Corps and civilian firms. Augier and Guo (2016, p. 268) highlight "We Leadership"

and specifically attribute the 29th CMC, General Gray, and his leadership style with a penchant for innovation as unique to the Marine Corps but similar to other "adaptive and resilient" organizations. The Marine Corps has excelled and succeeded in winning battles and self-preservation due to the outstanding innovation and leadership of its Marines.

2. Mavens

Successful recruiters ensconce themselves into communities as "mavens" connecting potential recruits to the Marine Corps (Gladwell, 2002). This means that the recruiter has leveraged their reputation resulting in influential members in the community trusting the recruiter and later directing and refer potential recruits to the USMC as the default "first choice." Though Gladwell writes of larger macro effects or "tipping points" at the national level, the point is well made and add that in the job of recruiting is much like that of a politician. The recruiter should be a maven who has won the hearts and minds of the community at their tactical level of a 3-block war (Krulak, 1999). Naturally, the USMC should screen and select recruiters that display maven-like qualities.

C. ECONOMETRICS

A non-military matching-friction study by Michiaillat (2012) used BLS and Current Population Survey (CPS) data from 1964 to 2009 and find that high unemployment negates job-matching frictions. Matching will become increasingly important because MCRC is entering historically low unemployment rates. The labor seller (enlistee) can afford to be more discriminating than his or her peer was a few years earlier.

Davis, Faberman, and Haltiwanger (2012) analyze industries from December 2000 to June 2011 with a treatment for recruiting intensity to the classic "general matching function" and reveal an inverse relationship between recruiting intensity and job-filling rates. Among their findings is that 40% of the unemployment shifts result from construction employment even though that industry only comprises 5% of total national employment. Slow-downs in construction labor demand during the Great Recession may have benefited the USMC at a critical time as analysis of the unemployment rate suggests difficult recruiting when the unemployment rate drops. If the 202,000 increase in end-strength during this same time happened at a time outside of an unusually long recession,

the USMC may have had difficulty recruiting adequate numbers of quality and quantity. The construction slow-down may have resulted in enlistments gained from these same persons who would have likely sought employment in the construction industry.

Lazear and Gibbs (2015, p. 30) address the shortfalls of screening proxies as they apply to new hires in civilian firms. If one considers a Marine being screened as a *new hire* to MCRC, some comparisons with respect to screening may apply. The best screening includes a probationary observation period while performing the job. A Marine who qualifies for enlistment, graduates from bootcamp, and earns several promotions is a great start but these are not specifically probationary equivalents of recruiting duty. A direct probation period as a recruiter is best but not a feasible solution. There may be tools to add low-cost improvements to existing USMC Human Resources information systems of Marine On-Line (MOL) and the Advanced Performance and Evaluation System (APES). Schweyer (2004) states employee referral programs are the most valuable recruitment tools (p. 141).

D. ENVIRONMENT

Lee Blank presented the global impact and an economy's need for a birthrate of approximately 2.1 per 1,000 for economic sustainment and growth (Lee, Joint Maritime Operations Fleet Seminar. 3.7. CDE 8051M, Runtime 24:00 to 26:00, 2008). The data tell us that more wealthy nations are subsidizing lower native birthrates with incoming immigrants. Those new generations will most likely normalize to the lower local U.S. birthrate. The U.S. birthrate is approximately 1,820 births per 1,000 women (CDC, 2018) where 2,100 per 1,000 women is the estimated minimum replacement rate with a slope that does not indicate leveling off at the time of writing (CDC, 2018). Looking as the birth cohort count of the year group target is a critical analysis to understand the supply of labor when studying AVF recruiting.

Ryder (1979) writes of the fertility cliff looming on the horizon resulting from societal changes. Family planning, life-goals, and the structure of the classic nuclear family are having a decreasing effect on the number of children born. Ryder predicts increased immigration and a workforce having greater participation by women. His concern is the

choice of pursuing work over child bearing which likely further reduces birthrates. Of note, males are born at few percentage points higher than females in the recent past (CDC, 2018). The reality is females, not males, are the limiting factor for future population replacement. These are all matters of free will and choice and valuable to note as the conditions of the AVF recruiting in the late 1970s may be different from those of today and the future.

The Dertouzos Garber study highlighted bad luck in assignment to poor producing areas combined with high missions yet acknowledge recruiter ability cannot be dismissed (2006). Success in recruiting and the description of luck relate to the Army solution for saturation. Agriculture Economics offers insight into to labor economics with respect to recruiting saturation via Range Management (assigned recruiter areas) and Economic Geography (Saturation). Recruiters, in their areas will place pressure in their markets similar to a cattleman places pressure or saturation on his pasture. Optimal grazing happens at approximately 10% left of the peak of the production function where certain areas yield optimality even further left of 10% depending on the environment and other unknown variables. The relevance to recruiting is that two similar areas may vary in per-capita output of enlistments given equal effort or pressure from production due to unknown or omitted variables.

1. Trust

The recruiting process centers on the exchange of trust between a recruiter and a potential enlistee. This is symbolic and a powerful moment for the young man or woman. There are infinite paths this individual could take, but they want to be a Marine—*now*—and the recruiter has found them. A four-year commitment for a 17-year-old is a large proportion of their life to-date; it is unlikely that any prior decisions or self-determined commitments to this point have been of such magnitude.

This is the classic construct in Labor Economics where the potential enlistee entered the interview as a buyer and the recruiter is selling the USMC to entice enlistment. When the interviewee desires enlistment with a handshake and agreeing to become a Marine, he or she becomes an applicant and is now selling his or her labor to the USMC. Roles reverse at this point in the exchange. The USMC is now the buyer and must maintain

its word, honor, and commitments. This will only happen when a foundation of trust is established.

Steven Covey (2006, p. 5) equated trust to "confidence" as the opposite of "suspicion in relationships." Covey elaborates (2006, p. 30) that trust is a "function of two things: character and competence," and this is critical for Marines. The value of reputation in a recruiter's ability to interact with people and find agreement, or a sale, is appropriately simplified to "trust, speed, and cost "(Covey, 2006, pp.264–5). The quality of the recruiter will have a direct impact on the probability of their reputation. Highly screened recruiters of the highest character and competence with the lowest probable variance of performance on mission are critical.

Systems operate within minimum and maximum measureable tolerances of conditions in the environment with consideration of the humans operating the system. A system can be a set of skills that are high or low technology, a combination of high and low cognitive tasks, and so on. Recruiting activity is a system and a human behavior thus it is observable and capable of measurement (L. G. Shattuck, class notes, September 25, 2017). The interaction that progresses from initial contact to enlistment and shipping to bootcamp requires trust between two individuals navigating within a larger system of systems (Salas, Stagl, & Burke, 2003).

2. Matching

Davis, Faberman, and Haltiwanger (2012) expand on the "standard matching function" by including a formulation for "recruiting intensity." Davis et al. (2012) do not specify active duty military as an industry in their study but the shared competitive labor market relevant to potential military enlistees requires *business-like* activity in military recruiting. Recruiting intensity such as advertising, screening standards, bonuses, and benefits referred to as "instruments" by Davis, Faberman, and Haltiwanger as most jobs do not "sell themselves." There is a need to prospect for enlistees by locating, screening, interviewing, and eventually enlisting high-quality American youth into the USMC. Once informed, the USMC captures the best the nation has to offer via the effort and matching of Marine recruiters.

The concept of recruiting intensity' in regards to enlistment and screening standards have room for some policy discretion but are a matter of law with minimum standards. The USMC has successfully self-selected to produce at higher than minimum standards. The population of who is eligible increases with lower enlistment standards below the current goal and down to legal minimums. This is an example of recruiting intensity with respect to how willing each service is to break from their ideal and remain legal. This is not a feasible policy solution for the USMC in finding and making the best Marines.

Matching has many levels with unobserved interactions that may appear as noise in studies attempting to find a signal and ideally, causation. Pema, Mehay, and Tick (2016) list difficulty with self-control as statistically significant in the choice to seek military service in their non-cognitive skills and job match study of Navy enlistees. This reinforces the larger body of literature with respect to the discount value USMC enlistees display (Hattiangadi, Ackerman, Kimble, & Quester, 2004). Pema et al. (2016) describe the non-cognitive profile of people who enlist as not able to delay gratification and not valuing investment in education. This is important as it can further explain the high discount rates extracted from reenlistment behavior later in military service careers with the introduction of Selective Reenlistment Bonuses as an observation (Arkes, 2017) or service as a whole (Warner & Pleeter, 2001).

What this says is those who have a taste for military service and meet enlistment requirements are likely to fall within the non-cognitive profile of lower self-control. The apparent correlation may then help explain some behavioral issues the services must address. The value of knowing this creates an opportunity to conduct non-cognitive screening of military recruiters and filtering out those who display low self-control. Eliminating such recruiters should improve enlistee quality via higher levels of self-control due to recruiter-to-prospect matching.

A sale or enlistment requires understanding which stem from dialogue, offers, acceptance, and commitments for action (Flores, 2013) and (P. Denning, Sense 21-notes, October 6, 2016). The USMC should want a recruiter who is mentally, emotionally, and physically prepared to project the ideal image, behavior, and, physique of the USMC species. He or she must have the discipline and only accept *birds of the same feather*. If

there is a *bad hire* in whom the recruiter chooses to recruit, then it makes sense that such an act is an introduction of variance in the species where survival is a matter of individual Marines' choices. The USMC invests in its messengers (recruiters) because they will interface and screen strangers attracted to the Marine Corps and must only accept enlistments of the highest of quality.

Theory by Sun Tzu and Clausewitz and the use of overwhelming force in combat versus winning by avoiding friction and accepting battle only in the most favorable conditions may apply. Recruiting is somewhere in the middle but Sun Tzu may have it *more* right in this aspect. Consider a Type-A recruiter who is best suited for a Type-A market who will not win sales with much efficiency aside from brute force in a Type-B market where assigned (field of battle). Rather, Sun Tzu would likely say, 100 attempts by a Type-A recruiter in a Type-B market will leave him exhausted and produce less than one attempt by the Type-A recruiter in the Type-A market.

3. Generations

Veteran populations are logical key influencers in the opinions and life-choice of enlistment in the target market (Malone & Clemens, 2013). Warner et al. (2003) find the decline of the veteran population as one of the key factors in the apparent reduction of propensity to enlist in the difficulty of AVF recruiting in the 1990s. Of note, there is an increasing frequency of anecdotal evidence of the children of veterans having significant propensity for service and may limit the span of veteran influence to an even narrower population of persons influenced.

Commander explains an approach to finding Millennials and reducing DEP attrition (2013). Commander suggests using what he described as "awareness" and targeted social media use. The awareness should be systematic training and education for recruiters in communicating and connecting with Millennials the key influencers: Baby Boomers and Generation X. Commander states social media is a low-effort means of canvasing compared to labor-intensive classic canvasing involving physical labor and effort. The value is suggested method of increasing recruiter effectiveness in an era of decreasing propensity among military-age youth and fiscal austerity while using high-quality by-

generation communication skills in mediums desired by each: in person or electronic. The fundamental element to this thesis and the recommendations boils down to matching as Commander (2013) quotes Lancaster and Stillman, "When recruiting attempts fail, the cause is almost always that the employee value proposition was a bad match or that it was not [sic] communicated successfully to the candidate in question" (Lancaster & Stillman, 2002, p. 181).

E. RECRUITER SCREENING AND MARKSMANSHIP

There are many parallels between Marine Corps Marksmanship and Marine Corps Recruiting. Marines and marksmanship are almost synonymous. Marines have earned the reputation of outstanding marksmen due to their dedication to training. The words of General Gray, 29th CMC, "Every Marine a Rifleman" are part of the USMC identity. Marines train in a marksmanship continuum of increasing complexity. Shooters receive instruction, practice and rehearse, and are inspected in their marksmanship knowledge, skills, and abilities (KSAs) prior to shooting for qualification. The Marksmanship Data Book has an uncanny similarity with the recruiter's Schedule and Results planner. A Marine and their service rifle are a fundamental system. Marksmanship is a valuable performance assessment in the USMC.

MCTP 3–01E (2016) states the requirements commanders should screen for to send to Scout Sniper School where the attributes are qualitative and not unusual (p. 1–7). The aptitude desired, particularly the characteristic of *equanimity*, combine for a specific type of Marine. The connection to recruiting is a sniper is a Marine who is by default a system, when armed with honed skills and a rifle, expected to perform a unique task. Beyond these basic qualifications, a future sniper is also a Marine with exceptional marksmanship skills. The recruiter will stalk in his or her assigned area like a sniper. The USMC should ideally desire a match of each recruiter to the appropriate market to patrol.

Jaunal (2017) analyzes the traits and characteristics that predict successful completion of the Marine Corps Scout Sniper Course and concludes that the non-cognitive trait of grit is among the statistically significant variables predicting success. Given that this is infeasible, pre-SDA and pre-recruiting assessments of non-cognitive traits such as

grit and salesmanship are valuable. Grit is a quality attributed to success in challenging scenarios and often outweighs classic cognitive standards (Duckworth, 2016). Self-selection occurs between choosing to enlist in the USMC or another branch of service. Assigning recruiters with significant grit would likely work well as they should match with potential high-quality applicants.

F. CHAPTER SUMMARY

The content and overview provided by this chapter orients the study on prior analysis of a range of studies relevant to AVF recruiting and specific to subjects covered within this thesis. The challenges posed by recruiting in the 1990s made a significant impact on the caution the USMC should take in order to anticipate future recruiting austerity. The Dertouzos and Garber study offers a wealth of methods in conducting studies related to recruiting. This thesis conducts a current and singular analysis incorporating the effects of market saturation combined with recruiter quality and matching to enlistees. The study applies USMC recruiting requirements to prior research and literature as a reference in developing efficiencies. Trust, communication, and matching are important to acknowledge as they lead to enlistment. The next chapter describes the data and describes the development of the models used in the study.

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IV. DATA AND METHODOLOGY

This chapter explains the data, methodology, and research design of the study. The concept of the models seek a method of differentiating markets by levels of saturation, pre-recruiting assessments, and recruiter to enlistee matching as it relates to the type of recruiter in a type of market. This study incorporates types of data from previous studies with the specifically added combination of market saturation to find a low-cost *whole-Marine concept* statistically significant model and solution with predictive power for Marines assigned to recruiting duty. A description of the data, cleaning, and formulation affords a record of the intuition for follow-on research.

A. ANALYSIS SOFTWARE

The thesis comprises information using Stata IC 13.1, JMP and Excel. This software is in use and taught in the curriculum for the Masters of Science in Management at the Naval Postgraduate School.

B. DATASETS

The data for this study are all USMC enlistments from 2007 to 2017 starting with 376,817 individual observations, gross contracts, provided by the USMC Total Force Data Warehouse (TFDW) containing enlistee and recruiter information in an unbalanced panel format. MCRC provides a separate dataset covering the same timeframe; however, it includes 407,504 observations. The MCRC dataset does not include recruiter information.

C. FINAL DATASET

The final dataset is a merge of the TFDW dataset and demographic information about localities of enlistment. The fiscal year and zip code of enlistment are the key variables linking the merged datasets. The merged data provides a single dataset of information connecting market saturation, the individual enlistee, and the recruiter. The study includes demographic information from the state and RS of each enlistment.

There are 16,349 duplicate enlistments or observations in the TFDW dataset. The first observation of enlistment remains in the dataset for the study. The study drops repeat enlistments for the same individual and are enlistees with the same identity that enlisted more than once. There were two to four enlistments per duplicate. Duplicate enlistments are possible as DEP discharges and reenlistments can occur for a variety of reasons. There are 1,315 observations of enlistment in the TFDW dataset with unusually short or long tour lengths. The recruiter tour length is the difference in time between the recruiter's first successful enlistee date of enlistment and the last enlistment. The recruiters in the universe of observations are recruiters with more than two and less than 40 months of service as recruiters. The result is 344,469 individual observations remaining to analyze recruiter match and interactions with market saturation. The study also includes a dataset of 528 RS observations (RS years) during the same 2007 to 2017 period.

The final dataset captures all recorded enlistments according to TFDW. The TFDW FY sums of enlistments do not equal the FY totals from MCRC. The definitive answer as to the cause of the difference in contracts covering the same period is unknown. There is value in the information retained in the dataset as it represents a majority of the information that links saturation, recruiter characteristics, and enlistee information capable of analysis. Of note, data specific to recruiter effort and goal setting with respect to phase-line goals and achievements such as contacts, interviews, and new applicants was requested but not available for the study. The lack of the aforementioned data limits analysis to a right-sided analysis. A study that is able to combine effort in the condition of a market population along with recruiter attributes combine for a much richer production function and likely to render more statistically and economically relevant analysis. A right-side only analysis, such as this, omits many variables and is less powerful in predictive analysis.

D. VARIABLES, TERMS, AND CATEGORIES OF DATA

The study utilizes location and mental aptitude variables common to the enlistee and recruiter. Of note, there is more information available for the recruiter. The study uses an interpreted adaptation of *classic* quartiles per standard USMC meritorious promotion methodology where Quarter 1 is the most competitive and Quarter 4 is least competitive

(see Table 1). A score in any of the attributes that qualifies for Quarter 1 in this set of attributes is ranked quantitatively and qualitatively higher than the other three quarters. The study separates recruiter attributes and characteristics based on performance and assessments prior to recruiting duty at the time of the recruiter's first contract. The description of the variables used in the study follows.

Table 1. Strict interpretation of the classic USMC standards

Quarter	AFQT	PFT	Pros & Cons	RIFLE	District Match	State Match
I	65-99	265-300	4.7-5.0	Expert	Yes/No	Yes/No
II	53-64	225-264	4.5-4.6	Sharpshooter	Yes/No	Yes/No
III	37-52	185-224	4.3-4.4	Marksman	Yes/No	Yes/No
IV	0-36	0-185	0.0-4.2	Unqualified	Yes/No	Yes/No

* PFT Combat NREQ coded as Quarter I. Medical and Partial PFTs coded as Quarter IV
*Rifle NREQ coded as Quarter III, only two instances in the study.

Only two percent of recruiters in the study fit neatly into the classic quarters as defined in Table 1. Most recruiters fall into differing strata of quarters when considering the *whole-Marine concept* (see Table 2). For example, a rifle expert may also have a lower AFQT score therefore strict quartiles are inefficient in adding significant power in this analysis. The study analyzes where production is highest by quarters of quantifiable recruiter attributes in singular and combined variable attributes in the regression analysis.

1. Dataset Variables

a) FY

The fiscal year of enlistment.

b) DEP_UUID

Each that enlists into the Delayed Entry Program with one unique observation or identification number in the dataset.

c) DEP_GENDER

The gender of the enlistee.

Table 2. Recruiter quarter summary frequency tables

Variable	Recruiter to DEP Match Observations	sum	% of Obs
RS_Market_Population_Tier_1 (Largest)	344,469	45313	0.13
RS_Market_Population_Tier_2	344,469	137909	0.40
RS_Market_Population_Tier_3	344,469	112367	0.33
RS_Market_Population_Tier_4 (Smallest)	344,469	48880	0.14
RSS_Market_Population_Tier_1 (Largest)	344,469	60965	0.18
RSS_Market_Population_Tier_2	344,469	100427	0.29
RSS_Market_Population_Tier_3	344,469	116607	0.34
RSS_Market_Population_Tier_4 (Smallest)	344,469	66470	0.19
REC_Tier1_Classic_USMC	344,469	1,484	0.00
REC_Tier2_Classic_USMC	344,469	5,365	0.02
REC_Tier3_Classic_USMC	344,469	354	0.00
REC_Tier4_Classic_USMC	344,469	0	0.00
AFQT_REC_T1	344,469	120,160	0.35
AFQT_REC_T2	344,469	82,068	0.24
AFQT_REC_T3	344,469	103,908	0.30
AFQT_REC_T4	344,469	45,000	0.13
PFT_T1_265_Up	344,469	67,759	0.20
PFT_T2_225_to_265	344,469	193,057	0.56
PFT_T3_185_to_225	344,469	67,740	0.20
PFT_T4_185_Down	344,469	15,913	0.05
REC_PRO_MARKS_T1	344,469	34,309	0.10
REC_PRO_MARKS_T2	344,469	231,295	0.67
REC_PRO_MARKS_T3	344,469	76,521	0.22
REC_PRO_MARKS_T4	344,469	2,344	0.01
REC_CON_MARKS_T1	344,469	34,431	0.10
REC_CON_MARKS_T2	344,469	220,812	0.64
REC_CON_MARKS_T3	344,469	85,175	0.25
REC_CON_MARKS_T4	344,469	4,051	0.01
RIFLE_EX_T1	344,469	230,526	0.67
RIFLE_SS_T2	344,469	73,739	0.21
RIFLE_MM_T3	344,469	39,496	0.11
RIFLE_UNQ_T4	344,469	520	0.00

d) DEP_DATE_OF_ENLISTMENT

The date the enlistee effectively enlists for the purpose of this study. Of note, this date is consistent in occurring during the years of the dataset, 2007 to 2017, versus use of the DEP_DECLARED_DATE.

e) DEP_AFQT_SCORE

The AFQT score of the enlistee at enlistment (see Table 3).

f) DEP_RACE

The racial code for the enlistee.

g) DEP_ETHNICITY

The ethnic code for the enlistee. Of note, there are 112,330 observation missing DEP_ETHNICITY prior to data cleaning.

h) DEP_STATE

The home state of the enlistee. There are 18,773 observations without a zip code. This is problematic but the study mitigates this by using the DEP_ZIPCODE to add RSS location by recruiter merging from the RSS. The recruiter RSS, RS, State, and District information is back-filled to any enlistee missing zip code location information by having the recruiter's RSS, RS, and District location as a link to each enlistment.

i) ZIP_FINAL

The home zip code the enlistee. There are many issues with the zip codes in the dataset. In addition to the 11,632 observations missing zip codes and 39,680 entries with four digits or fewer. Among these errors is a trend involving leading 0s that is data-cleaned if the DEP_UUID matches the following states: CT, MA, ME, NH, NJ, RI, VT, VI, and PU or PR (Puerto Rico).

j) DEP_DOB

The enlistee's date of birth.

k) REC_UUID

Each individual recruiter (Marine) in the entire timeframe where one recruiter with his or her unique identification number appears multiple times due to recruiting multiple unique enlistees. There are 10,831 recruiters in the dataset prior to cleaning.

l) REC_RANK

The recruiter's rank at the time of their first contract as a recruiter.

m) REC_GENDER

The recruiter's gender.

n) REC_AFQT_SCORE

The recruiter's AFQT score (see Table 3). The study uses continuous variables and analysis by quarters converting to dummy variables where one equals membership to that recruiter attribute quarter. The study analyzes where production is highest by quarters of quantifiable recruiter attributes in singular and combined variable attributes in the regression analysis.

Table 3. AFQT Quarter

Quarter	Quality	Mental Group	AFQT	Notes
IV	Alpha	I & II	65–99	
III	Alpha	IIIA	53–64	
II	Alpha/Bravo	IIIA-B	37-52	
I	Bravo	IIIB- V	0-36	USMC minimum is 31

o) PFT_SCORE

The recruiter's PFT score at the time of first contract enlistment (see Table 4). The study uses continuous variables and analysis by quarters converting to dummy variables where one equals membership to that recruiter attribute quarter. The study analyzes where production is highest by quarters of quantifiable recruiter attributes in singular and combined variable attributes in the regression analysis.

Table 4. Physical fitness test scores

Quarter	PFT Score
IV	265 ≥
III	225 ≥ & < 265
II	185 ≥ & < 225
I	< 185

p) REC_RACE

The racial code for the recruiter. There may be some issues with REC_RACE as 1,122 recruiters elected to claim "DECLINED TO RESPOND." This resulted in 35,584 observations not capable of race-match analysis or 10% of the TFDW dataset observations.

q) REC ETHNICITY

The recruiter's ethnicity. Of note, there were 3,129 that "DECLINED TO RESPOND." This is 29% of the total recruiter population in the sample.

r) REC_STATE

The recruiter's home state.

s) REC_EDU_0_to_4

The education level of the recruiter at the time of their first contract. Of note, there were 75 recruiters without an education level in the dataset (see Table 5). The study uses continuous variables and analysis by quarters converted to dummy variables where one equals membership to that quarter. The study assigns each dummy variable by type to a categorical value of zero to four where four indicates a higher order of value. The categorical variables for REC_EDU_0_to_4 is and exception in using five categorical values compared to the other variables in the study.

Table 5. Recruiter education sorted by quarters for this analysis

	Quarter	Education Code
REC_EDU_0_to_4	IV	"ASSOC DEG," "BACHELORS," "MASTERS"
REC_EDU_0_to_4	III	"HS DIPL," "1 SEM COL,"
REC_EDU_0_to_4	II	"CERT ATT," "CORSP DIP"
REC_EDU_0_to_4	I*	"GED", "GED NATGD," "HOME STDY," "LESS HS"
REC_EDU_0_to_4	0*	"NEAR COMP," "NON TD HS," "OCC CERT," "ADULT DIP", "EXAM FAIL,", "_"

*Tier III per DoD standards is an enlistment without credentials and Quarter 0 in this study.

t) REC_PRO_AVG_SVC

The recruiter's career proficiency marks. Of note, the last rank a Marine receives proficiency marks is for the rank of corporal (E-4) (see Table 6). The study uses continuous variables and analysis by quarters converting to dummy variables where one equals membership to that recruiter attribute quarter. The study analyzes where production is highest by quarters of quantifiable recruiter attributes in singular and combined variable attributes in the regression analysis.

Table 6. Proficiency and conduct marks

Quarter	Proficiency and conduct marks
IV	$4.7 \geq$
III	$4.5 \geq$ & < 4.7
II	$4.3 \geq$ & < 4.5
I	< 4.3

u) REC_CON_AVG_SVC

The recruiter's career conduct marks. Of note, the last rank a Marine receives conduct marks is for the rank of corporal (E-4) (see Table 6). The study uses continuous variables and analysis by quarters converting to dummy variables where one equals

membership to that recruiter attribute quarter. The study analyzes where production is highest by quarters of quantifiable recruiter attributes in singular and combined variable attributes in the regression analysis.

v) Marksmanship

The analysis used rifle class (1 to 4) rather than continuous scores due to changes in scoring in the recent past. The USMC rifle scoring system has changed at least three times in the past 20 years. Of note, there are 18 scores missing and 15 recruiters indicating "UNQUALIFIED," (see Table 7). The study uses continuous variables and analysis by quarters converting to dummy variables where one equals membership to that recruiter attribute quarter. The study analyzes where production is highest by quarters of quantifiable recruiter attributes in singular and combined variable attributes in the regression analysis.

Table 7. Rifle qualification

Quarter	Classification of rifle marksmanship
IV	Expert
III	Sharpshooter & Not Required
II	Marksman
I	Unqualified or blank

w) NC_ACH

The total contracts each RS writes or processes per Marine Corps Reporting Information Support System (MCRISS) per FY. Of note, there may be some difference in the numbers achieved when referencing the results of an FY dependent on reconciliation and when comparing different datasets (recorded in February 2018 for the study).

x) NC_OBJ

The total new contract mission objective tasking in MCRISS for each RS per FY. Of note, there may be some difference in the tasking numbers when referencing the results of an FY dependent on changes in contracting tasks from MCRC and Districts to the RSs throughout the FY (recorded in February 2018 for the study).

y) RS_FY_Contracting_Delta

The difference in contracts the RS obtains comparing to the objective for each RS per FY.

z) Market_Population_RS_Sum

The count of the target population per RS as the sum of the target population for all zip codes assigned to the RS by FY.

aa) Recruiters_per_RS_FY

The count of recruiters per RS recorded on the October Activity Report for each FY from 2007 to 2017.

bb) REC_per_RS_Sqrd

The square of the variable: Recruiters_per_RS_FY.

cc) SQR_Miles_Sum_RS

The total square miles of each RS as the sum of area by zip code assigned per RS (Bittner, 2014).

dd) Median_RS_Income_FY

The median income by FY and RS-state.

ee) St_Unemply_Rate

The unemployment rate by FY and RS-State.

ff) HS_Grad_Rate_St

The high school graduation rate by FY and RS-State.

gg) College_Enrllmt_St

The college enrollment count by two and four year institutions by FY and RS-State.

hh) State_Civ_Non_Inst_pop

The population count by FY and RS-State.

ii) Adverizing_FY_3C1F

The published dollar value of advertising according to the President's Budget request contained within the Undersecretary of Defense (Comptroller) defense budget materials by FY.

jj) ADVRTSNG_1_priorFY

The published dollar value of advertising according to the President's Budget request contained within the Undersecretary of Defense (Comptroller) defense budget materials for one prior FY.

kk) ADVRTSNG_2_priorFYs

The published dollar value of advertising according to the President's Budget request contained within the Undersecretary of Defense (Comptroller) defense budget materials for two prior FYs.

ll) DEP_AFQT_Avg_RS

The average AFQT score of all enlistments by FY and RS.

mm) NonWhite_DEPs_RS

The count of all enlistees by FY and RS not categorized as “WHITE” according to race.

nn) Staff

The difference between RoP and missioned canvassing recruiters by FY for MCRC.

oo) REC_Success_63_APR_1_FY

The binary variable of for recruiters where 1 equals a recruiter with a contracted DEP pool by FY with an alpha percentage above 63% (enlistees having an AFQT ≥ 50) and an APR ≥ 1.0 per Tour.

pp) REC_Success_63_APR_1_Tour

The binary variable of for recruiters where 1 equals a recruiter with a contracted DEP pool by Tour with an alpha percentage above 63% (enlistees having an AFQT ≥ 50) and an APR ≥ 1.0 per Tour.

qq) Market_Population_RSS_Sum

The count of the target population per RSS as the sum of the target population for all zip codes assigned to the RSS.

rr) SQR_Miles_Sum_RSS

The total square miles of each RSS as the sum of area by zip code assigned per RSS (Bittner, 2014).

ss) Median_State_HH_Income

The median state income of the state of the home state of the enlistee.

tt) NonWhite_DEPs_RSS

The count of all enlistees by FY and RSS not categorized as “WHITE” according to race.

uu) Match_REC_District_All

The binary variable to indicate a recruiter match to their district of enlistment according to a recruiter's home state if indicated with the data available.

vv) Match_REC_Home_State

The binary variable to indicate a recruiter match to their state of enlistment according to a recruiter's home state if indicated with the data available

ww) RoP

Total recruiters on production (staff and canvassing recruiters) for MCRC by FY.

xx) FY2007 to FY2017

The Fiscal Years from 2007 to 2017.

2. Marksmanship as a Key Variable

Martin (2016), in his NPS thesis about Marine Corps Marksmanship, states that the majority of Marines maintain their level of marksmanship qualification and do not appear to change over time. The study includes marksmanship as Martin reports marksmanship rifle scores generally behave as a stable performance indicator (2016). Rifle qualification is a ubiquitous test and may capture non-cognitive attributes. The study uses rifle scores as a proxy for discipline and effort where Marines receive the same training and have an equal opportunity to excel in qualifying as an Expert.

E. CONCEPTUAL MODEL

This research finds the optimal number of recruiters on production given the USMC market share while identifying production responses according to market populations and recruiter attributes. Finding causal attributes leading to satisfactory recruiter contract production affords a solution beyond a single aggregated number of recruiters on production and is closer to the intent of optimization. Given that a recruiter graduates the Basic Recruiters Course (BRC) regardless of race, sex, MOS, age, or any other recorded and available variable, he or she should be able to recruit and ship high-quality enlistees. Stating this differently, recruiter-A is equal to recruiter-B. Variations in market population, holding everything else constant, or *Cetaris Paribus* (*c. p.*) likely affects results of contract production to include the expectation of results (Anderson et al., 2008, pp. 192–204).

Placing all recruiters into a single *type* creates one large distribution (see Figure 6). The wider the bell curve, or distribution, the more variance in the observations.

The conceptual model of this study adds to the literature of recruiting by analyzing the labor input of USMC recruiters and the notion that success is predictable when analyzing latent information within the USMC HR system that was collected prior to assignment to recruiting duty. This is the nature of the alternative hypothesis of this thesis. The study explores the hypothesis that the assignment of recruiters, according to specific attributes, may yield statistically significant predictions about the contracting potential of recruiters within certain types of markets. The study acknowledges individual choice and infinite interacting variables are involved which make declarations of causality extremely challenging.

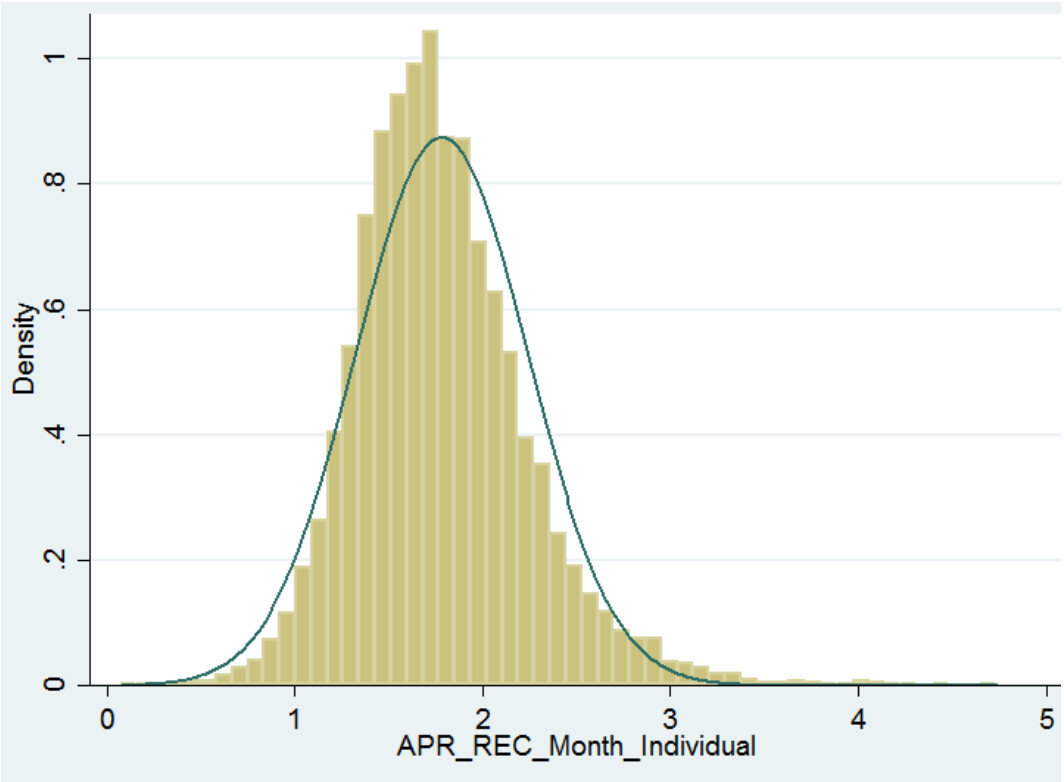

Figure 6. Distribution of recruiter APRs 2007 to 2017

Narrow distributions can offer policy makers well-behaved results and conversely may reveal policies that result in large amounts of undesirable variance. An examination of Figure 6 reveals the aggregation of recruiters in the study, regardless of the saturation of the market assigned, fall into a well-behaved normal distribution. Policy analysis at this level may not reveal differences seen between levels of saturation or recruiters by type. The ability to discern differences in policy between markets requires a separation of markets by levels of saturation.

The study attempts the use of quarters to study saturation in this manner. The study uses distinct lines to qualify recruiters as members within each quarter (critical value or pass-line) according to their RSS and RS market population, individual AFQT, PFT, marksmanship, proficiency and conduct marks. The study assumes recruiters are heterogeneous or not identical. The study acknowledges there are many interactions and unknowns. A model or tool such as the alternative hypothesis describes may help in assigning recruiters to areas that set them up for success (i.e., working with what you have).

F. THEORETICAL APPROACH

The approach taken to develop models for this thesis incorporates the simplest of production functions to afford flexibility in adaptation and elegance in understanding. The production function, mentioned in Chapter I, is the basic economic model for the production function in the study.

$$Q= f (L, K)$$

Stated differently, the simplified production function rewritten for recruiting is:

Quantity of Production (Contracts) = Labor + Capital

The study focuses on labor as the input of interest for the response of quantity and quality of contracts. A portion of the analysis focuses on individual recruiter productivity via the idea that there are four basic types of recruiters according to pre-recruiting

assessments. The intuition is that the ability to classify recruiters renders statistically significant predictive capability. The four types are broken into quarters (High = 4 to Low=1). Recruiter APRs offer some value in making comparisons between recruiters (see Figure 6).

Categorizing future recruiters into quarters would ideally sort every recruiter to RS matches where MCRC issues orders to recruiters according to RSs that prior analysis indicates their highest statistically significant likelihood of success. This can afford increasing the response or product quantity without increasing L or K. Adding variables is possible in order to account for market specific preferences. Of note, the majority of the 344,469 enlistments in the study originate from the second and third most populated RS and RSS market populations.

The analysis of individual recruiters to RS and RSS market population yields little information with the data available. There is insufficient RSS structure, tasked missions, results, or data about effort, available to study and conduct the analysis the thesis originally embarks upon. The study is not able to compute the goal of calculating the optimal assignment of recruiters by type to their ideal market in order to optimize production via matching.

G. MODEL SPECIFICATIONS

I develop a linear regression model and logistic regression models in this thesis. The linear model regresses the number contracts achieved per RS per FY as the response variable outcome conditioned on specific variables of interest. The logistics models regress the likelihood of recruiter success by tour and FY equaling one as the response variable.

1. RS Contracts

Linear regression provides the coefficients for estimation of the model in the study. The key variable in the linear regression model is the potential market population per RS (see Table 8). The intuition is that a more densely populated area should afford more

opportunity to find an enlistee and therefore increase recruiter productivity for the RSs with larger market populations. The first key explanatory variable in the regression is the sum of the RS market population of persons potentially qualified to enlist by zip code for each RS by FY. The second key variable is the number of recruiters assigned per RS operating in the market. Units will fluctuate in the actual number of personnel on-hand regardless of what is published in the Table of Organization. The study uses the month of October for RS recruiter strength by count for each FY as a manpower snapshot because this is when the USMC is theoretically closest to structure balance within the HRDP even though MCRC is an excepted command. Other explanatory variables included for demographic input are the state unemployment rate, high school graduation rate, median state income level, college enrollment population by state, state civilian non-institutionalized persons, and each states' presidential election outcome.

2. Recruiter Probability of Success

Logistic regression provides the probability of success for a recruiter in the FY and for an entire tour equaling one (see Table 9). The measure of success in the study is a recruiter having a DEP pool above 63% of all enlistees having an AFQT $\geq$ 50 and an APR $\geq$ 1.0 per FY. The DEP AFQT standard of the study is a specified MCRC quality requirement for contracting the majority of recruiters attain. The key variables in the logistic models are the potential market population per RSS and RS. A variation of the model includes a formulation combining the effect of market size and specific recruiter attributes (Dertouzos & Garber, 2006). The intuition is that a more densely populated area should afford more opportunity to find an enlistee and therefore increase recruiter productivity, regardless of recruiter attributes. The study analyzed a separate logistic regression for the entirety of each tour per recruiter. Other explanatory variables included are similar to the linear regression are for demographic input are the state unemployment rate, high school graduation rate, median state income level, college enrollment population by state, state civilian non-institutionalized persons, and each states' presidential election outcome.

Table 8. Model 1: RS linear regression summary statistics

Variable	N	Min	Max	Mean	Standard Deviation
NC_ACH	528	437	1327	773	145
NC_OBJ	528	437	1343	766	151
RS_FY_Contracting_Delta	528	-240	248	6	39
Market_Population_RS_Sum	528	195,051	571,471	318,174	65,383
Recruiters_per_RS_FY	528	26.00	73	45.9375	8.636112
REC_per_RS_Sqrdd	528	676.00	5329	2184.695	815.3397
SQR_Miles_Sum_RS	528	1,249	291,845	59,785	64,026
Median_RS_Income_FY	528	$39,009	$73,361	$53,041	$7,335
St_Unemply_Rate (%)	528	2.40	13.70	6.36	2.40
HS_Grad_Rate_St (%)	528	58.91	91.08	79.54	6.47
College_Enrllmt_St	528	116,848	2,732,147	883,464	773,424
State_Civ_Non_Inst_pop	528	1,444,435	31,000,000	10,600,000	8,694,042
Advertizing_FY_3C1F	528	$142,000,000	$272,000,000	$208,000,000	$40,300,000
ADVRTSNG_1_priorFY	528	$114,000,000	$272,000,000	$202,000,000	$47,900,000
ADVRTSNG_2_priorFYs	528	$114,000,000	$272,000,000	$195,000,000	$54,200,000
Pol_Pres_Election (0=Dem, 1 =Rep)	528	0.00	1	0.4128788	0.4928183
DEP_AFQT_Avg_RS	528	55.9	67.2	62	2
NonWhite_DEPs_RS	528	4	393	92	62
Staff	528	570	630	604	20
Staff Staff_Squared	528	324900	396900	365,781	24,647

Table 9. Model 2a and 2b: Recruiter success logistic regression summary statistics

Variable	N	Min	Max	Mean	Standard Deviation
REC_Success_63_APR_1_FY	344,469	0	1	0.74	0.44
REC_Success_63_APR_1_Tour	344,469	0.00	1	0.80	0.40
REC_Below_63_APR_1_FY	344,469	0.00	1	0.26	0.44
REC_Below_63_APR_1_Tour	344,469	0.00	1	0.20	0.40
Market_Population_RSS_Sum	344,469	1,247	83,307	27,736	10,610
SQR_Miles_Sum_RSS	344,469	17	235,797	4,721	12,859
St_Unemply_Rate	344,469	2	14	6.44	2.45
Median_State_HH_Income	344,469	$32,338	$76,260	$52,352	$7,764
HS_Grad_Rate_St	344,469	54	91	78.32	6.69
College_Enrllmt_St	344,469	29,853	2,732,147	883270	761400
State_Civ_Non_Inst_pop	344,469	396,036	31,000,000	10,600,000	8460025
NonWhite_DEPs_RSS	344,469	0	86	9	10
Adverizing_FY_3C1F	344,469	$142,000,000	$272,000,000	$206,000,000	$43,200,000
ADVRTSNG_1_priorFY	344,469	$114,000,000	$272,000,000	$194,000,000	$52,500,000
ADVRTSNG_2_priorFY	344,469	$114,000,000	$272,000,000	$182,000,000	$57,300,000
Pol_Pres_Election (0=Dem, 1 =Rep)	344,469	0	1	0.40	0.49
Marksmanship (0=Unq, 4=Expert)	344,469	1	4	3.55	0.70
REC_PRO_AVG_SVC	344,469	0	49	4.51	0.27
REC_CON_AVG_SVC	344,469	0	49	4.50	0.27
REC_AFQT_SCORE	344,469	0	99	57.49	17.80
REC_PFT	344,469	0	300	244	35
REC_Race	344,469	0	1	0.68	0.47
REC_Gender	344,469	0	1	0.97	0.18
REC_EDU_0_to_4	344,469	0	4	2.97	0.49
Match_REC_District_All	344,469	0	1	0.77	0.42
Match_REC_Home_State	344,469	0	1	0.37	0.48
RoP	344,469	2,850	3,150	3,031	115
FY2007	344,469	0	1	0.1377	0.3446
FY2008	344,469	0	1	0.1448	0.3519
FY2009	344,469	0	1	0.1180	0.3226
FY2010	344,469	0	1	0.0980	0.2973
FY2011	344,469	0	1	0.0983	0.2977
FY2012	344,469	0	1	0.0844	0.2780
FY2013	344,469	0	1	0.0722	0.2588
FY2014	344,469	0	1	0.0588	0.2353
FY2015	344,469	0	1	0.0597	0.2368
FY2016	344,469	0	1	0.0634	0.2437
FY2017	344,469	0	1	0.0648	0.2461

H. CHAPTER SUMMARY

The data available for MCRC to formulate solutions for the optimal number of RoP exists but must be cleaned, merged, and assigned variables to build regression models. The chapter describes the data and variables. The simplest model design is preferred and built in the study affording flexibility to add variables as they appear with additional analysis. The focus of the models in order are saturation, recruiter attributes, and matching.

V. RESULTS

This chapter discusses the results of the analysis at the RS and recruiter level with a cost basis used for determining optimality according to the marginal cost of the recommendation for additional recruiters. Overall, many variables are statistically significant but not economically significant where others showed no statistical significance. Differences in the size of the target market population when comparing RSs and RSSs are statistically significant but not economically significant. More contracts are probable for the RS with increase in the RS target population while fewer contracts are probable with a larger RSS target population for the recruiter. Time is analyzed as a measure of productivity utilizing days between contracts (contract turnover) via linear, logistic, and right-censored logistic (tobit) regressions for the RS and recruiter. This time analysis failed to produce statistically or economically significant results. Goal attainment and production up-to and not beyond the missioned goal appeared to be problematic in determining optimality based on the information available. The chapter concludes with a calculation of the marginal cost of recruiter labor per additional enlistment gained with the recommended addition of canvassing recruiters.

A. LINEAR REGRESSION: RECRUITING STATION

The response variable for the primary model predicts an increase in 16 contracts per each additional missioned canvassing recruiter per RS holding all else constant ($p<0.01$) (see Table 1052). The interpretation of the regression is that additional recruiters increase the labor of the production function and yield economically significant returns on investment. A gain of 16 contracts per recruiter is within reasonable expectations. The model also predicts one additional enlistment per RS with the addition of one RoP that is not a missioned canvassing recruiter and referred to as *staff* ($p<0.01$). The interpretation is that the predicted increase in one contract from one additional staff recruiter is likely due to indirect labor in the production function via increased leadership value with the effect of reduced DEP attrition and increased adherence to phase-lines in production, by canvassing recruiters. The model finds a negative effect on RSs with larger state civilian

non-institutionalized populations with the effect of four fewer contracts per additional one million civilian non-institutionalized persons ($p<0.1$). This is relevant as this figure includes many persons not in the target market that may act as influencers where less densely populated areas may ironically be denser in veteran representation and have influential positive effects on the available target market (Malone & Clemens, 2013).

Table 10. Linear regression model

reg NC_ACH VARIABLES	(1) NC Achieved	(2) Market Info	(3) Staff
Market_Population_RS_Sum	0.000289***	0.000344***	0.000380***
	(7.19e-05)	(6.24e-05)	(6.17e-05)
Recruiters_per_RS_FY	13.06***	16.62***	16.47***
	(3.665)	(3.091)	(3.031)
REC_per_RS_FY_Sqrd	-0.0117	-0.0686**	-0.0709**
	(0.0388)	(0.0329)	(0.0322)
SQR_Miles_Sum_RS	-6.67e-05	4.26e-05	2.74e-05
	(6.35e-05)	(6.37e-05)	(6.26e-05)
Median_RS_Income_FY		-0.000431	-4.34e-05
		(0.000644)	(0.000637)
St_Unemply_Rate		-1.831	-2.719
		(2.253)	(2.218)
HS_Grad_Rate_St		0.266	0.0671
		(0.699)	(0.687)
College_Enrllmt_St		8.84e-05***	8.05e-05***
		(2.85e-05)	(2.80e-05)
State_Civ_Non_Inst_pop		-5.09e-06**	-4.27e-06*
		(2.50e-06)	(2.46e-06)
Adverizing_FY_3C1F		-5.46e-07***	-8.33e-07***
		(1.90e-07)	(1.97e-07)
ADVRTSNG_1_priorFY		-3.92e-07*	-5.00e-07**
		(2.21e-07)	(2.18e-07)
ADVRTSNG_2_priorFYs		-2.68e-07*	-8.60e-08
		(1.37e-07)	(1.40e-07)
Pol_Pres_Election		0.0755	4.560
		(8.634)	(8.523)
DEP_AFQT_Avg_RS		-1.855	-1.591
		(2.351)	(2.306)
NonWhite_DEPs_RS		0.0872	0.0511
		(0.0647)	(0.0639)
Staff			1.047***
			(0.226)
Constant	110.0	387.5***	-213.6
	(85.93)	(144.5)	(192.3)
Observations	528	528	528
R-squared	0.641	0.780	0.789

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The regression results (see Table 1052) and the key explanatory variables, all statistically significant ($p<.01$), yield a basic production function (see Equation 1). Two separate formulations solve for the gain in contracts according to additional recruiters.

$$NC\_ACH_{ijt} = \beta_0 + \beta_1 \text{ Market\_Population\_RS\_Sum}_{it} \quad (1)$$

$$+ \beta_2 \text{ Recruiters\_per\_RS\_FY}_{it} + \beta_3 \text{ REC\_per\_RS\_Sqrd}_{it} + \beta_4 \text{ SQR\_Miles\_Sum\_RS}_{it}$$

$$+ \beta_5 \text{ State}_{jt} + \beta_6 \text{ Advertising}_{t} + \beta_7 \text{ DEP\_detail}_{it} + \beta_8 \text{ Staff}_{t} + \epsilon_{ijt}$$

The dependent variable NC_ACH_{ijt} represents the number of contracts written for RS *i*, demographic information *j*, and FY *t*. $State_{jt}$ represents local demographic information for the RS according to the state the RS is located within by FY for the following independent variables: state median income, state unemployment rate, state high school graduation rate, count of persons enrolled in college by state, the population of non-institutionalized civilians by state, and state electoral presidential election outcome (1 if republican). $Advertising_t$ represents three individual variables with advertising dollars spent during the current FY, and the two previous FYs. DEP_detail_{it} represents the average AFQT score and the count of non-white enlistees per RS by FY.

1. RS Results: Statistically Significant but not Economically Significant

Many of the demographic variables found in similar analyses about recruiting show statistical but not economic significance in this study (see Table 10). The model predicts an increase in approximately four enlistments with each increase of 10,000 potential enlistees per RS target market, holding all else equal ($p<0.01$). Of note, the enlistment per market population may be endogenous as this is likely the result of goal setting according to market population and fair share tasking. Use of the target market population as a key variable is a likely or partially endogenous input in the results of contracts achieved by RSs in the study.

RSs in states with higher counts of persons enrolled in college yield a positive and statistically significant yet economically insignificant result. The interpretation is the RS and the recruiters assigned to states with higher college enrollment are likely benefiting by

being located within a higher quality market. This counters the negative correlation to higher median state income levels (not statistically significant) as higher state income and higher college enrollment usually interact in similar directions and are indicative of affluence of states or localities (census.gov, 2018). This also means the effect of college enrollment numbers have a significant effect on RS contracting potential when compared to the insignificant effect of state income level. A graphical but non-regression example may help explain the difficulty of finding causality with respect to income levels where RSs that over-contract or under-contract in an FY can come from either side of the same income level (see Figure 7).

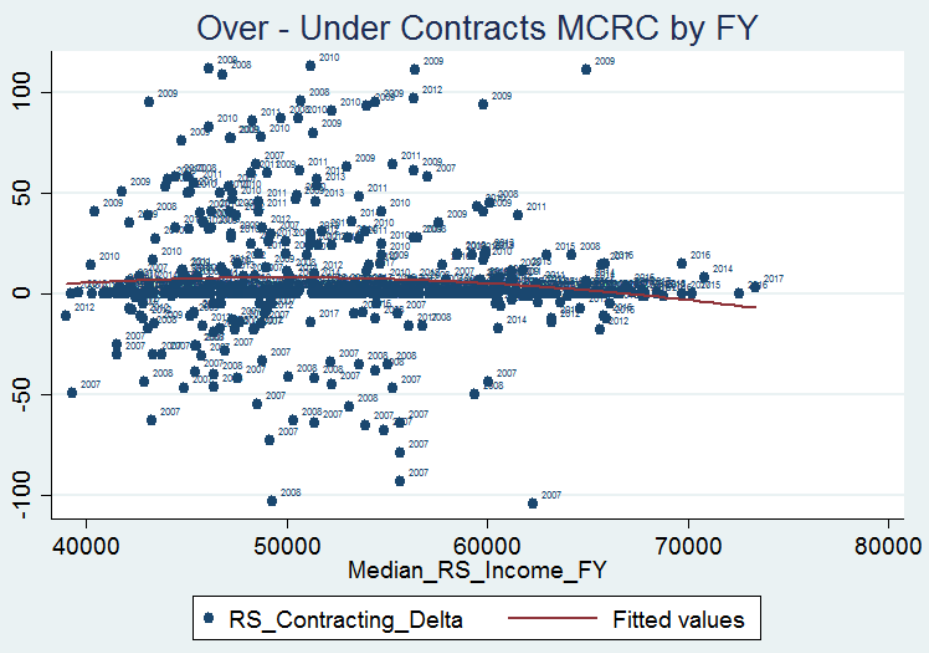

Figure 7. Over-contracting and under-contracting by state income

Demographics such as higher income and higher college attendance are usually associated with higher test scores for youth coming in these areas. An RS located in a more affluent area should therefore benefit with greater odds of any random person in the target market of the RS having an AFQT score ≥ 50 making the RS location a statistically better market for recruiting quality defined by AFQT, holding all-else equal. Increases in state

civilian non-institutionalized civilians show a statistically significant decrease in contracting yet is not economically significant. The interpretation of this result combined with more land area and a larger target population having positive effects on contracting is that larger, less dense RSs with disproportionately large target populations and high college enrollment are areas that offer promise of larger per-capita yields when contracting. The combined interpretation is economically meaningful where the recruiters will have less population to process through to find high-quality youth. Fewer persons per recruiter should be preferred.

2. RS Results: Not Statistically Significant

States with higher median income have negative but not statistically significant effects on contracting for RSs. The land area in square miles per RS is not statistically significant but suggested 2.74 more contracts per FY for every increase of 100,000 additional square miles assigned per RS, all else held equal. Increases in high school graduation rates and the location of an RS within a state categorized as Republican in the previous presidential election favor larger contracting achievements but are not statistically significant. Increases in state unemployment rates for the state the RS is located within have a negative effect on contracting for the RS but are not statistically significant. Increases in non-white enlistments increases the contracting potential of an RS but is not statistically significant.

3. RS Results: Discussion

Goal setting and attainment may present problems in finding optimality in the classic sense of maximizing contracting yield of labor and capital based on the assumption of maximum and equal effort by each recruiter. The free-market is classically comprised of free-willed entities seeking to maximize profit (see Figure 8). Goal achievement can therefore dis-incentivize over-contracting or the total potential of a team of recruiters in the market where nature would allow them to continue production without restrictions in order to maximize profit. There are generous rewards programs within MCRC yet these may appear unattainable to many and therefore do not incentivize the majority of recruiters. A reward scheme will usually only motivate those who believe they have a likelihood of

winning the reward by being near the threshold where others further away from the threshold likely rationalize the extra effort is futile (Lazear & Gibbs, 2015, p. 246).

The first interpretation of the study is that the results appear to reflect behavior and market conditions for contracting productivity. The penalty for not making mission, if larger than the penalty for writing bad or doomed-to-attrite contracts, may incentivize recruiters to write contracts for today and not worry about attrition should a low-quality or hard-sale contract fail as an attrition later in the future. This interpretation has a correlation to the personal discount rates of individual recruiters. This is the intuition behind near consistent mission accomplishment yet a DEP attrition rate in the 17% to 20% range in the study.

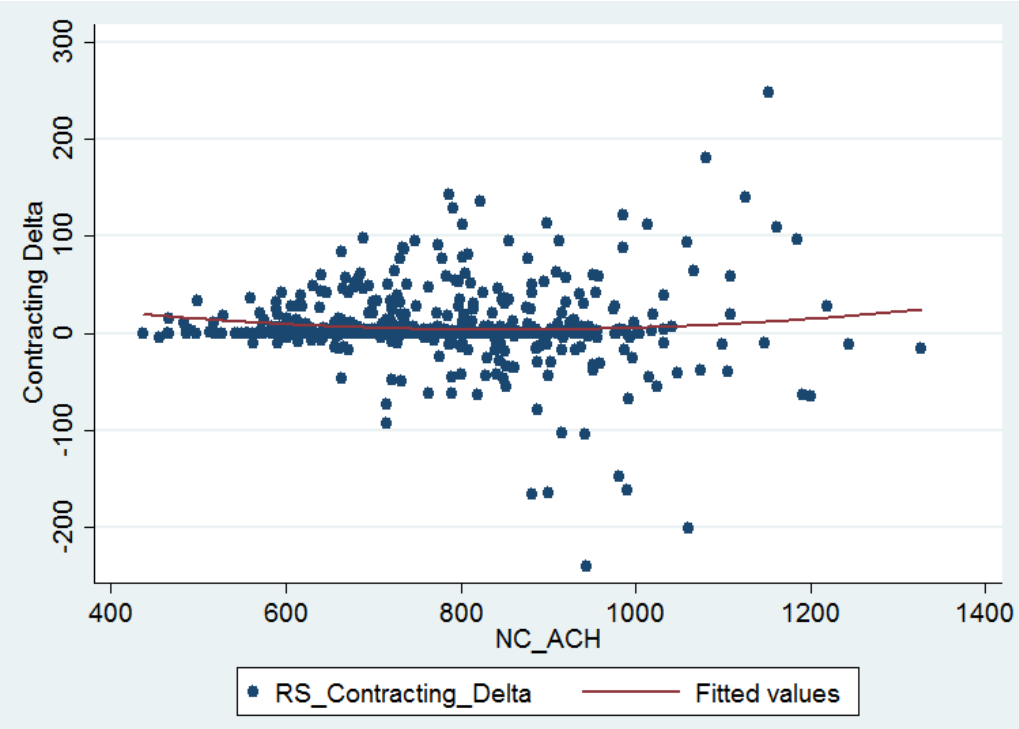

Figure 8. Contracts over and under written with fitted parabola (flat)

The second interpretation from the analysis is some areas and recruiters may contract enlistments with less comparative effort due to larger a larger market population, a higher quality per-capita target market, higher propensity to enlist by area, or a

combination of the three. This situation may create higher probabilities for some recruiters and RSs located in areas where a randomly selected person in the target market is of higher quality and probability of enlistment compared to other areas, all other variables held constant. This interpretation is a generalization and unfortunately not based on data derived from the study, particularly lacking effort as a key input. The study evaluates time as a proxy for effort and productivity but fails to yield statistically significant results. An examination of the raw data graphically displays shorter contract turnover times between contracts for RSs with smaller target market-to-recruiter ratios (see Figure 9).

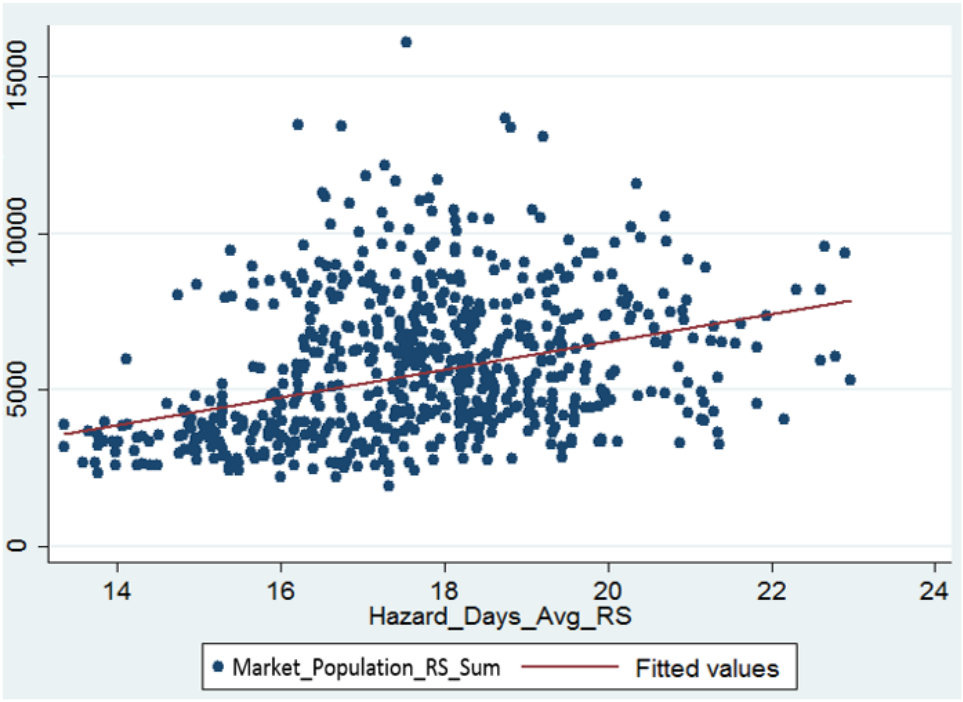

Figure 9. RS time between contracts compared to market population

The RS or recruiter assigned to a higher producing area may be required to stop production in order to maintain bootcamp shipping plans and therefore stop producing with excess capacity remaining in any particular month or FY. Such a system is likely not able to be optimized in the classic economic sense but rather will be *functional* where inefficiencies are reduced where and when able. This means excess capacity will likely exist and not reveal data capable of optimizing until recruiting goals are increases to the

point where a substantial number of recruiters fail to make mission. The study originally embarks on a method of eliminating the effect of a larger market by comparing recruiters by quality and effort at the RS and RSS market level but the analysis is not feasible due to the lack of available data.

B. LOGISTIC REGRESSION: RECRUITER SUCCESS

This section introduces the statistical and economic significance of the variables in the analysis of individual recruiters (see Table 11 and Table 12). The response is a recruiter FY or tour of duty meeting the criteria of being successful according to the study. The study defines success as having a contract DEP pool above 63% alpha (AFQT scores ≥ 50) and a minimum APR ≥ 1.0 for the FY for model 2a and for a tour for model 2b. The analysis also studies the APR threshold to levels of 1.4, 1.8, and 2.2, but yields similar yet less powerful results. A recruiter APR of 1.0 or above remains as the threshold in the study in order to maximize observations. Analysis determines which variables predict the probability of success on recruiting duty for the individual recruiter given the market target population and specific recruiter attributes for a fiscal year and an entire tour on recruiting duty. Many of the variables in the analysis show statistical and economic significance while others are statistically significant but fail to yield economic significance. The study analyzes the count of average days between contracts at the recruiter level as a measure of recruiter performance but fails to produce statistically significant results.

The study fits logistic regressions with two response variables. The responses regressed are that any random recruiter in an FY or in their tour is categorized as successful per the definition in the study (see Table 11). The study specifies the probability of success according to the variables included (see Equation 2).

$$\Pr(\text{REC\_Success\_FY} = 1)_{ijkt} = F(\beta_0 + \beta_1 \text{Market\_Population\_RSS\_Sum}_{jt} \quad (2)$$

$$+ \beta_2 \text{SQR\_Miles\_Sum\_RSS}_{jt} + \beta_3 \text{State}_{kt} + \beta_5 \text{Advertising}_t + \beta_6 \text{REC\_detail}_i$$

$$+ \beta_7 \text{NonWhite\_DEPs\_RSS}_{jt} + \beta_8 \text{Match\_REC-District\_All}_{it}$$

$$+ \beta_9 \text{Match REC\_Home\_State}_{it} + \beta_{10} \text{FY2007}_t \ldots + \beta_{20} \text{FY2017}_t + \epsilon_{ijkt}$$

The dependent variable REC_Success_FY $_{ijkt}$ represents likelihood of success in an FY as defined by the study for missioned canvassing recruiter *i*, demographic information for the RSS *j*, demographic information for the state *k*, and FY *t*. State$_{kt}$ represents local demographic information for the RS the recruiter works within by FY for the following independent variables: state median income, state unemployment rate, state high school graduation rate, count of persons enrolled in college by state, the population of non-institutionalized civilians by state, and state electoral presidential election outcome (1 if republican). Advertising$_t$ represents three individual variables with advertising dollars spent during the current FY, and the two previous FYs. REC_detail$_i$ represents pre-recruiting attributes for each recruiter for the following independent variables: recruiter AFQT, PFT score, average service proficiency and conduct marks, marksmanship class, gender, race, and education. The recruiter details did not change across time or location for each recruiter.

The logistic regression for any random recruiter in a tour yields the odds ratios for the likelihood of a recruiter being successful (see Table 12). The study specifies the probability of success according to the variables included (see Equation 3).

$$\begin{aligned}\Pr(\text{REC\_Success\_Tour} = 1)_{ijkt} = F(&\beta_0 + \beta_1 \text{Market\_Population\_RSS\_Sum}_{jt} \\ &+ \beta_2 \text{SQR\_Miles\_Sum\_RSS}_{jt} + \beta_3 \text{State}_{kt} + \beta_5 \text{Advertising}_t + \beta_6 \text{REC\_detail}_i \\ &+ \beta_7 \text{NonWhite\_DEPs\_RSS}_{jt} + \beta_8 \text{Match\_REC-District\_All}_{it} \\ &+ \beta_9 \text{Match REC\_Home\_State}_{it} + \beta_{10} \text{FY2007}_t \ldots + \beta_{20} \text{FY2017}_t + \epsilon_{ijkt}\end{aligned} \tag{3}$$

The dependent variable REC_Success_Tour$_{ijkt}$ represents likelihood of success in the timeframe of observed recruiter tours as defined by the study for missioned canvassing recruiter *i*, demographic information for the RSS *j*, demographic information for the state *k*, and the FYs *t* covered by each individual recruiter tour.

1. Recruiter: Statistically and Economically Significant

Only two recruiter assignment area demographic characteristics emerge as statistically and economically significant. Recruiters are marginally less likely to be successful if assigned to a state categorized as Republican in the previous presidential election. Of note, this specific variable was not statistically significant in the RS contract regression. The odds are a recruiter is four-percentage points by FY and as many as ten-percentage points less likely by tour, less likely to be successful with an assignment to a state categorized as Republican in the previous presidential election, all else held equal. The results of state political categorization on the likelihood of success are likely due to state populations. Democrat states tend to be the most populated and therefore may present a richer recruiting environment. In the 2016 Presidential election, three of the five most-populous states were identifying as Democrat, with Democrats comprising 61% of these states' populations. The 2008 Presidential election tally of the same five most-populous states results in four of the five most populated states identifying as Democrat and representing 78% of the total sum of these five states' populations. Recruiters assigned to states with higher graduation rates are less likely to be successful compared to those assigned to states with lower graduation rates. There is approximately a one-percentage point drop in the odds of recruiter success for each percentage point increase in state high school graduation rates, and this correlation is statistically significant for the FY and tour ($p<0.01$). Recruiters are approximately two percentage points more likely to be successful per FY ($p<0.1$) and seven percentage points more likely to be successful per tour ($p<0.01$) if assigned to their home state, all else held equal. Recruiters are one percentage point less likely to be successful per FY ($p<0.01$) and two percentage points less likely to be successful per tour ($p<0.01$) with each one percentage point increase in RSS non-white DEP enlistments per recruiter. This last variable may be a factor of market environment where minorities tend to geo-locate and historically score lower on the ASVAB. The result is that a recruiter may suffer from bad luck assignment to an area less capable of producing high-quality contracts compared to another area for any number of reasons, all else held equal (Dertouzos & Garber, 2006).

The study analyzes recruiter attributes to determine probability of success using information already collected and resident within the USMC information systems. The most significant pre-recruiting attribute is the rifle score which is statistically significant ($p<0.01$). A recruiter with a higher rifle classification is marginally more likely to be successful per FY and tour compared to a recruiter of a lower rifle classification while holding all else constant. A recruiter with a higher rifle score has greater odds that are five percentage points by FY and four percentage points per tour greater toward predicting success compared to recruiters with lower rifle qualifications, all else held equal ($p<0.01$).

Recruiters are more likely to be successful with higher levels of education with odds of approximately three percentage points and six percentage points more likely per FY and tour, respectively, to be successful, all else held equal ($p<0.01$). Recruiters are more likely to be successful by approximately one percentage point in the FY and tour for every one percentage point increase in their service proficiency marks, all else held equal ($p<0.01$). Recruiters are less likely to be successful by approximately two percentage points in the FY and three percentage points per tour for ever one percentage point increase in their service conduct marks, all else held equal ($p<0.01$). Recruiters are approximately nine percentage points less likely to be successful if assigned to their home district of enlistment and seven percentage points more likely to be successful if assigned to their home state per tour ($p<0.01$) (see. Tables11 and 12). One potential explanation of the change in likelihood of success from a wider scope of home district to the narrower scope of home state is the added benefit of familiarity with an assigned area with the potential for family and friend networking, support, and enlistment referrals. The decrease in likelihood for a recruiter assigned to their home district to be less successful than a random recruiter not assigned to their home district is difficult to explain.

Table 11. Logistic regression: Recruiter DEP alpha AFQT ≥ 63% and APR ≥ 1.0 FY

logit REC_Success_63_APR_1_FY	(1)	(2)	(3)	(4)
VARIABLES	Base-Line	Market Info	REC Info	FYs
Market_Population_RSS_Sum	-6.74e-06***	-2.16e-06***	-1.34e-06***	-1.42e-06***
	(3.59e-07)	(4.10e-07)	(4.13e-07)	(4.13e-07)
SQR_Miles_Sum_RSS	-7.80e-07***	-7.48e-07**	-1.42e-06***	-1.30e-06***
	(2.91e-07)	(3.13e-07)	(3.11e-07)	(3.11e-07)
St_Unemply_Rate		-0.00533**	-0.00588**	-0.00236
		(0.00261)	(0.00262)	(0.00266)
Median_State_HH_Income		1.15e-05***	1.17e-05***	8.80e-06***
		(6.91e-07)	(7.00e-07)	(7.46e-07)
HS_Grad_Rate_St		-0.00622***	-0.00809***	-0.0107***
		(0.000745)	(0.000752)	(0.000766)
College_Enrllmt_St		1.28e-07***	1.52e-07***	2.07e-07***
		(3.49e-08)	(3.50e-08)	(3.54e-08)
State_Civ_Non_Inst_pop		-7.75e-09**	-8.13e-09***	-1.37e-08***
		(3.07e-09)	(3.09e-09)	(3.13e-09)
NonWhite_DEPs_RSS		-0.0176***	-0.0146***	-0.0141***
		(0.000439)	(0.000450)	(0.000451)
Adverizing_FY_3C1F		1.57e-09***	1.43e-09***	2.31e-09***
		(2.28e-10)	(2.42e-10)	(4.75e-10)
ADVRTSNG_1_priorFY		5.75e-09***	5.27e-09***	6.17e-09***
		(2.99e-10)	(3.06e-10)	(6.59e-10)
ADVRTSNG_2_priorFYs		5.74e-10***	5.26e-10**	-6.65e-10*
		(1.91e-10)	(2.09e-10)	(3.50e-10)
Pol_Pres_Election		-0.0190*	-0.0196*	-0.0439***
		(0.0102)	(0.0103)	(0.0106)
Marksmanship			0.0611***	0.0504***
			(0.00564)	(0.00568)
REC_PRO_AVG_SVC			0.0138**	0.0170***
			(0.00653)	(0.00654)
REC_CON_AVG_SVC			-0.0179***	-0.0202***
			(0.00647)	(0.00647)
REC_AFQT_SCORE			0.00465***	0.00450***
			(0.000229)	(0.000229)
REC_PFT			0.00152***	0.00133***
			(0.000116)	(0.000117)
REC_Race			0.295***	0.294***
			(0.00886)	(0.00887)
REC_Gender			0.171***	0.181***
			(0.0214)	(0.0214)
REC_EDU_0_to_4			0.0348***	0.0332***
			(0.00796)	(0.00798)
Match_REC_District_All			-0.00824	-0.00995
			(0.0103)	(0.0103)
Match_REC_Home_State			0.0118	0.0160*
			(0.00925)	(0.00927)
Constant	-1.224***	0.346***	1.841***	-1.923***
	(0.0110)	(0.0593)	(0.174)	(0.331)
Observations	344,469	344,469	344,469	344,469

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12. Logistic regression: Recruiter DEP alpha AFQT ≥ 63% and APR ≥ 1.0 Tour

Logit REC_Success_63_APR_1_Tour VARIABLES	(1) Base-Line	(2) Market Info	(3) REC Info	(4) FYs
Market_Population_Sum	-1.21e-05***	-6.46e-06***	-5.37e-06***	-5.37e-06***
	(3.87e-07)	(4.50e-07)	(4.55e-07)	(4.55e-07)
SQR_Miles_Sum_RSS	5.74e-07*	1.42e-06***	3.53e-07	5.20e-07
	(3.34e-07)	(3.67e-07)	(3.60e-07)	(3.60e-07)
St_Unemply_Rate		-0.00506*	-0.00586**	0.00256
		(0.00294)	(0.00296)	(0.00300)
Median_State_HH_Income		1.31e-05***	1.36e-05***	8.69e-06***
		(7.75e-07)	(7.87e-07)	(8.35e-07)
HS_Grad_Rate_St		-0.00788***	-0.0111***	-0.0144***
		(0.000824)	(0.000834)	(0.000851)
College_Enrllmt_St		-1.86e-08	2.56e-08	9.64e-08**
		(3.86e-08)	(3.88e-08)	(3.92e-08)
State_Civ_Non_Inst_pop		8.04e-09**	6.20e-09*	-1.34e-09
		(3.40e-09)	(3.43e-09)	(3.48e-09)
NonWhite_DEPs_RSS		-0.0227***	-0.0186***	-0.0183***
		(0.000467)	(0.000480)	(0.000480)
Adverizing_FY_3C1F		2.55e-09***	2.43e-09***	6.33e-09***
		(2.55e-10)	(2.70e-10)	(5.65e-10)
ADVRTSNG_1_priorFY		3.33e-09***	2.67e-09***	-1.95e-09**
		(3.37e-10)	(3.48e-10)	(7.93e-10)
ADVRTSNG_2_priorFYs		4.98e-09***	4.91e-09***	5.27e-09***
		(2.19e-10)	(2.42e-10)	(4.17e-10)
Pol_Pres_Election		-0.0662***	-0.0654***	-0.109***
		(0.0113)	(0.0115)	(0.0118)
Marksmanship			0.0542***	0.0401***
			(0.00614)	(0.00618)
REC_PRO_AVG_SVC			0.0147**	0.0195***
			(0.00729)	(0.00730)
REC_CON_AVG_SVC			-0.0254***	-0.0286***
			(0.00721)	(0.00721)
REC_AFQT_SCORE			0.00660***	0.00641***
			(0.000256)	(0.000256)
REC_PFT			0.00255***	0.00230***
			(0.000128)	(0.000129)
REC_Race			0.444***	0.442***
			(0.00973)	(0.00974)
REC_Gender			0.279***	0.297***
			(0.0232)	(0.0233)
REC_EDU_0_to_4			0.0617***	0.0592***
			(0.00875)	(0.00878)
Match_REC_District_All			-0.0870***	-0.0889***
			(0.0115)	(0.0115)
Match_REC_Home_State			0.0660***	0.0743***
			(0.0103)	(0.0103)
Constant	1.728***	-0.283***	-1.983***	3.989***
	(0.0121)	(0.0656)	(0.192)	(0.391)
Observations	344,469	344,469	344,469	344,469

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

2. Recruiter: Statistically Significant but Not Economically Significant

Many of the demographic variables found to be statistically significant in similar analyses also show statistical significance in this study but do not offer economic significance. An increase in RSS target population decreases a recruiter's contracting yield and is statistically significant but not economically significant ($p<0.01$). Recruiters are at a disadvantage in the FY if assigned to larger RSSs by measure of square miles and statistically yet not economically significant for the FY ($p<0.01$) where this same variable loses all significance for a recruiter tour.

Recruiters assigned to states with higher median incomes have positive statistically significant effects on their probability of success yet this is not economically significant for the FY and tour ($p<0.01$). Recruiters assigned to states with higher college enrollment have positive and statistically but not economically significant results for the FY ($p<0.01$) and tour ($p<0.05$). Recruiters are at a statistically significant yet not economically significant disadvantaged if assigned to states with higher civilian non-institutionalized civilians for the FY ($p<0.01$) with no statistical significance in the scope of an entire tour. Recruiter AFQT and PFT scores show increases in the probability of recruiter success and are statistically but not economically significant ($p<0.01$).

3. Recruiter Results: Not Statistically Significant

State unemployment is not statistically significant in predicting individual recruiter success but shows direction and a decrease in a recruiter's probability of success for the FY and an increase in the probability of success per tour. The results of the tour analysis make sense in economics as more unemployed persons per capita who not employed and likely seeking income and opportunities should afford larger numbers of persons to recruit who are seeking employment and opportunities. This translates to a greater likelihood of a recruiter having a successful tour. The result of FY success when with respect to state unemployment appears to have a short-run counter-intuitive effect on recruiter success where the expected result is an increase in unemployment should afford easier recruiting. The effect of rising state unemployment rates on recruiter FY success is likely capturing omitted variables.

C. OVERALL ANALYSIS DISCUSSION

Correlations or causality of success are difficult to determine at the recruiter, RSS, and RS levels. A distinct pattern of making mission and relatively few instances of over-contracting or under-contracting indicates achievement as potentially linked to artificial cessation of effort or production once the goal is achieved. This is not a criticism but rather a reality to production recruiting that creates a difficult problem when attempting to optimize this form of production function. Attrition is problematic in the study and not used in this analysis. The use of DEP attrition as an input variable is linked to the response variables of contracts achieved. Increases in DEP attrition translate to increases in contract objectives and missions. The data and results suggest a potential correlation between DEP attrition and the observed and nearly consistent achievement of making mission. A consistent near-zero difference of contracts achieved compared to contracts tasked indicates two of infinite possible explanations.

First, missions might be set too low as the variance in frequency and quantity of fails by RS contracts appear unnaturally low but results in contract-loss later in the future. This may be correlated to a phenomenon known as *end-of-the month* recruiting in the literature (Arkes & Cunha, 2014). A *hard-sell* or poor quality contract may be the equivalent of a post-dated check in the behavior of the recruiters while Marines, specifically above other branches of the military, display unusually high discount rates for the future value of money (Hattiangadi et al., 2004; Arkes, 2017). Similar correlations can be derived from a person's personal discount rate as it relates to investment in education, self-development, and long-term projects. The application of the individual financial intelligence of recruiters may be linked and transfer some explanatory power to DEP attrition. A second possible explanation is the inverse of the first. The RSs and their recruiters are maximizing effort and recruiting everyone eligible to make mission. Some of these enlistments will naturally attrite, even in the best of conditions. The high stress and pressure to not fail with monthly production may override DEP management and focus efforts on the immediacy of monthly production.

The overall interpretation from the linear and logistic regressions about market populations and recruiter attributes is relatively weak when searching for causality. Of

note, recruiter rifle qualifications have the strongest positive individual indicator of success with an approximately 5% greater chance of success for recruiters who achieve higher marksmanship classifications at a 99% level of statistical significance. Of note, some RSs display distinctly higher AFQT scores and may present an opportunity to match high-AFQT recruiters to these markets to maximize matching, specifically the Northwest. Advertising for the USMC directed toward these markets may yield above average returns on investment (see Figure 10).

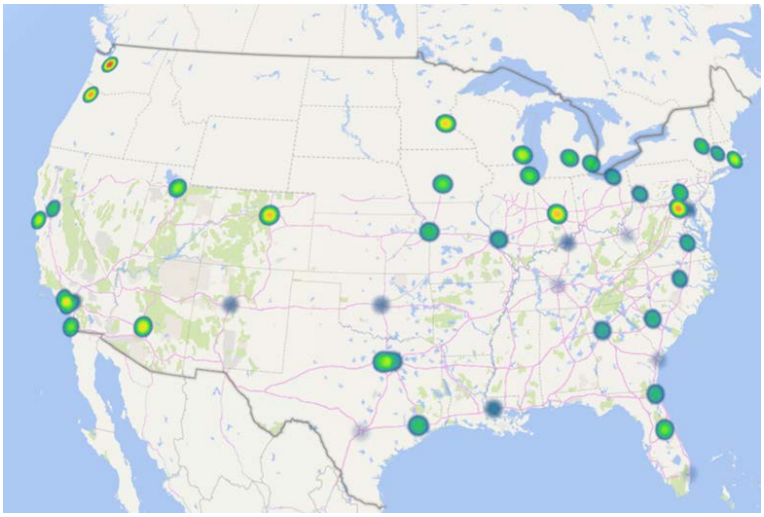

Figure 10. AFQT score heat map by RS, 2007 to 2017

D. FORMULATION OF LINEAR REGRESSION RESULTS

The study uses the coefficients from the RS linear regression in a model to compute the optimal number of recruiters according to canvassing recruiters and RoP staff to reach a goal of at least 1,000 additional high-quality contracts. The study estimates the marginal costs per contract gained with additional recruiters. The study makes comparisons between a typical three-year tour for a missioned canvassing recruiter and a non-PCS and non-missioned RoP. The study uses two PCS cost moves in the calculation to support the reality of the HRDP to source each additional recruiter. Two PCS moves is conservative as each PCS move of one Marine may require multiple PCS moves of others to back-fill personnel due to the HRDP. There are few possibilities to conduct a no-cost move or Permanent

Change of Assignment (PCA) move into or out of recruiting duty. PCS moves are the rule with few if any exceptions (see Table 13). The study used a generic cost comparison of a missioned canvassing recruiter in receipt of Special Duty Allowance (SDA) compared to two types of RoP staff: entitled and not entitled to SDA. The total cost is conservative as the opportunity cost of a Marine not in the Fleet is difficult to monetize compared to the gain in high-quality enlistments if said Marine is serving as a recruiter.

The study does not use base pay as a cost difference in this analysis and characterized as a sunk cost (see Table 14). The study derives costs from the following: SDA pay (SDAP) Program (Marine Corps Order 7220.12R, 2013), the advance notification of change to MCO 7220.12R SDAP (MARADMIN 302/17, 2017), the fiscal year 2018 individual clothing allowances (MCBUL 10120, 2017), and the non-discounted PCS cost estimate of is $9,546 per PCS (Grayson, 2016).

1. Linear Regression Solution

I estimate the potential number of contracts per additional missioned canvassing recruiter assigned to an RS using the key explanatory variables (see Equation 4).

$$\begin{aligned}\text{Gain in NC\_ACH} = ((&16.47\ \text{Market\_Population\_RS\_Sum} * \\ &(\textit{Each}\ \text{Additional missioned canvassing recruiter per RS} \\ &+ 46\ \text{Mean\_Recruiters\_per RS and FY}) - 0.0709\ \text{REC\_per\_RS\_Sqrd} \\ &* (\textit{Each}\ \text{Additional missioned canvassing recruiter per RS} \\ &+ 46\ \text{Mean\_Recruiters\_per RS and FY})^2) - (16.47\ \text{Market\_Population\_RS\_Sum} \\ &* 46\ \text{Mean\_Recruiters\_per RS and FY} - 0.0709\ \text{REC\_per\_RS\_Sqrd} \\ &* 46\ \text{Mean\_Recruiters\_per RS and FY}^2)) * 48\ \text{Number of RSs (FY Dummy Variables)}\end{aligned} \quad (4)$$

I estimate the potential number of contracts per additional recruiter not on production and assigned to an RS using the key explanatory variables (see Equation 5).

$$\text{Gain in NC\_ACH} = 48 \text{ Number of RSs} * 1.05 \text{ Staff} \quad (5)$$

The study uses the financial cost of each enlistment gained per recruiter as a sum of permanent change-of-station (PCS) costs as a component of the optimal solution of recruiters (see Table 13). Grayson (2016) estimates the average cost of a PCS move is $9,546. This appears conservative when considering the cost of the moving company and all entitlements paid. Managerial accounting methods and practitioners would suggest stabilizing costs by minimizing variable costs as a preferred strategy for management accounting and profit in the long-run costs (Horngren, Srikant, & Rajan, 2015, pp. 297–300, 518–520).

The study finds an increase in one recruiter per RS yields 474 Contracts gained per FY holding all other variables constant. A conservative estimate of the marginal cost the first 474 enlistments gained through additional recruiters is $3,021.09 per contract gained. The marginal benefit decreases with the addition of recruiters and is typical in production functions where added labor will have diminishing value. Of note, the model only shows gains and does not predict negative returns with the addition of recruiters. Negative returns with the addition of recruiters appears to involve additional recruiters (labor) far beyond current numbers in the production and outside (further right) of statistical relevance.

Table 13. Marginal costs per RoP by type

RoP	Uniforms	PCS in	SDA (3 Yrs)	PCS out	Marginal Cost (tour)	Partial MC per FY	HRDP PCS (x2) / Yr	MC w/ HRDP costs
Sectored Recruiter	$544	$9,546	$12,600	$9,546	$32,236	$10,745	$19,092	$29,837
Staff w/SDA	$544	$9,546	$12,600	n/a	$22,690	$7,563	n/a	$7,563
Staff w/o SDA	$544	$9,546	n/a	n/a	$10,090	$3,363	n/a	$3,363

The study finds an increase in one staff member per RS yields 50 Contracts gained per FY holding all other variables constant. A conservative estimate of the marginal cost the first 50 enlistments gained through additional staff not paid SDA is $3,202.86 per

contract gained. A conservative estimate of the marginal cost the first 50 enlistments gained through additional staff paid SDA is $7,202.86 per contract gained.

2. Breakeven Analysis

The addition of missioned canvassing recruiters is the single most economically efficient option for MCRC when adding manpower to increase contracts (see Table 14). The return of contracts gained per recruiter added to each RS is a net gain of 16 high-quality contracts per FY for a total gain of 474 contracts per year with the addition of one missioned canvasing recruiter per RS. This estimate does not account for attrition or other exogenous variables not accounted for in the regression. The results are the result of the annual RS mission and RS contracts achieved. The study assumes the mission assignment for the RS for each additional missioned canvassing recruiter in the study is constant. The gain in 16 contracts is logical and economically significant. The cost of each additional contract gained by additional recruiters increases due to diminishing returns but is specifically not a negative marginal return.

Table 14. Recruiter cost comparison by type

	RoP: Sectored Recruiters			RoP: Staff w/o SDA			RoP: Staff w/SDA		
Add per RS	Contracts gained	Marginal Cost	Est. Tot Cost	Contracts gained	Marginal Cost	Est. Tot Cost	Contracts gained	Marginal Cost	Est. Tot Cost
1	474	$3,021	$.1.4M	50	$3,203	$0.2M	50	$7,203	$0.4M
2	941	$3,043	$2.8M	101	$3,203	$0.3M	101	$7,203	$0.7M
3	1,402	$3,065	$4.2M	151	$3,203	$0.5M	151	$7,203	$1.1M
4	1,855	$3,088	$5.7M	202	$3,203	$0.6M	202	$7,203	$1.5M
5	2,302	$3,110	$7.1M	252	$3,203	$0.8M	252	$7,203	$1.8M
6	2,742	$3,134	$8.5M	302	$3,203	$1.0M	302	$7,203	$2.2M
7	3,176	$3,157	$10.0M	353	$3,203	$1.1M	353	$7,203	$2.5M
8	3,602	$3,181	$11.4M	403	$3,203	$1.3M	403	$7,203	$2.9M
9	4,022	$3,205	$12.8M	454	$3,203	$1.5M	454	$7,203	$3.2M
…	…	…		…	…	…	…	…	…
81	16,346	$7,097	$116.0M	4,082	$3,203	$13.1M	4,082	$7,203	$29.4M
82	16,269	$7,219	$117.4M	4,133	$3,203	$13.2M	4,133	$7,203	$29.8M

The breakeven point in gaining contracts with additional recruiters between RoP missioned canvassing recruiters and RoP staff not paid SDA is eight additional recruiters per RS, or 384 more recruiters across MCRC, at the projected marginal cost of $3,181 per additional contract gained. Nine additional recruiters per RS increases the marginal cost to $3,205 per contract and eclipses the marginal cost of RoP staff not paid SDA. This level of additional recruiters marks a distinct decision point of adding RoP staff to compliment

additional recruiters due to a matched or lesser marginal cost per contract. The addition of 82 more recruiters per RS eclipses the marginal cost of RoP staff entitled to SDA pay (career recruiters not on production). This means the marginal cost per contract gained will cost $7,219 with the addition of 1,968 recruiters and equal the marginal cost of contracts gained by one additional RoP staff in receipt of SDA and not on production. This is economically significant.

The addition of RoP staff members not entitled to SDA pay is the second most expensive option for MCRC if adding manpower to increase contracts. The addition of RoP staff members entitled to SDA pay is the single most expensive option for MCRC if adding manpower to increase contracts. The gain, from additional staff is less economically significant than the potential gains in adding missioned canvassing recruiters. The gain in one contract is less distinct than the gains by missioned canvassing recruiter. The gain in contracts from RoP not entitled to SDA pay is likely the result of added leadership in staff support, training for recruiters, and the relief of some tasks on the canvasing recruiters. The gain in contracts from RoP entitled to SDA pay and not on production is likely the result of added leadership in phase-line attainment, training for recruiters, DEP management, and the relief of some tasks on the canvasing recruiters.

This chapter provides an analysis and interpretation of the study. The chapter provides an analysis of the linear regression for RS contract production from the study. The chapter interprets the logistic functions predicting recruiter success for the FY and a recruiter tour from the study. The combined interpretation and the calculation of the optimal number of recruiters to add by cost is explained in this chapter followed by the recommendations, conclusion, and recommended future study.

VI. CONCLUSIONS AND RECOMMENDATIONS

The chapter includes three recommendations resulting from analysis and a recommended future study. The recommendations are comprised of the optimal number of recruiters to add to the recruiting force, an approach toward filling a current gap in information, and a recommendation to improve recruiter volunteerism. The recommended future study is a DEP attrition study of recruiter credit scores and a potential link to DEP attrition.

A. RECOMMENDATION: ADD RECRUITERS

The quantitative recommendation is to add at least three missioned canvassing RoP recruiters per RS. The addition of 144–missioned canvassing recruiters across MCRC should yield a net capacity gain of 1,400 high-quality enlistments without the addition of RoP staff. An increased investment in labor capacity via missioned recruiters on production while holding contracting constant should reduce the steady-state mission task per recruiter and increase quality contracting. Lower volume recruiting should allow RS commanders to focus on quality contracting and DEP management, where the result should be lower DEP attrition. Additional recruiters reduce individual contracting mission quantities and should increase overall quality. The study finds the current thin labor market to endure for the indefinite future and advises added recruiting capacity. This recommendation resonates with Malone and Clemens (2013) and provides capacity in a thin and possibly thinning labor market. Lower DEP attrition should result of higher quality contracting with the precipitating effect of lower DEP-attrition in the future and further reducing the quantity of contracts required in the future.

The study estimates the cost of 144 additional recruiters to be approximately $4.2 million while not accounting for the opportunity costs in the Fleet. Lower financial cost options may include converting RoP currently not on production to missioned canvassing RoP recruiters and saving PCS cost moves. The marginal cost of converting RoP staff not on production (8412s) already in receipt of SDA may be at or near zero cost.

B. QUALITATIVE RECOMMENDATIONS

There are two possible non-quantitative areas for improvement in the current design of sourcing recruiters. The first addresses a gap in the information to assess recruiters prior to assignment to recruiting duty. An assessment tool identifying specific Marines as having a natural talent for sales would be highly valuable in statistical analysis and may possibly offer some predictability and ability to identify successful recruiters. The second recommendation is a reflection of personal recruiting experience and studies at the NPS. An expansion of the dialogue about recruiting duty and the words used to describe the responsibility of the tour may benefit MCRC by increasing the number of volunteer recruiters who are intrinsically motivated and matched to the job of recruiting duty.

1. Create the Marine On-Line Recruiter Referral (R2)

Create the MOL Recruiter Referral (MOL-R2) tool during the proficiency and conduct occasions to allow this assessment as a matter of record by a Marine's chain of command. Marines with prior MCRC experience may be particularly qualified to assess and mark Marines as *R2*. Incorporating this step may add value and may be capable of inclusion into the newly fielded electronic SDA package. The R2 tool may leverage innovation via leaders sharing and creating information of value for MCRC. Leaders in the fleet can help in the generation of recruiter assignments by identifying Marines as naturally inclined to recruiting. This low-to-medium-effort roster of Marines previously identified as having an aptitude for recruiting duty (communication, salesmanship, and soft-skills), may increase the quality of the sample of Marines selected for recruiting duty via the HSST lists.

There is a point of diminishing returns for information collection but the potential value gained appears worth the effort. This modest information collection may improve the MCRC solution in sourcing recruiters. Former members of the MCRC team are particularly qualified as key leaders, sensors, and scouts. Former recruiters gain certain skills and attributes resulting from their tour on recruiting duty. They carry a keen sense of emotional intelligence and an eye for gifted communicators. MCRC can capture post-recruiting duty

skills learned as a long-term return on investment where former recruiters directly prospect for the next generation of recruiters.

Though charisma fits within leadership and enthusiasm, the ability to articulate *salesman* about a Marine on an officer's Morning Report is something that does not currently exist. Given that most 8411s, and former MCRC Operations Officers, OSOs, XOs and RS COs will return to the Fleet, they should be enfranchised as experienced recruiting duty SMEs and given an option to act as MCRC sensors. This capability, if added to MOL, can potentially leverage unprecedented information to advance the Marine Corps' HR system to a strategic asset. The R2 assessment of a Marine, as it relates to recruiting, could be the equivalent of a predicted rifle Expert.

Most Marines assigned to recruiting duty will successfully complete the tour as would a shooter qualify on a rifle range. My prediction is national economic and demographic indicators are trending toward AVF recruiting adversity. The USMC should seek to select recruiters much like scout sniper selection by looking among rifle Experts (MCTP 3–01E, 2016). The dilemma is marksmanship is directly relevant to being a Sniper where no such assessment exists that is relevant to being a recruiter. Though MCRC is successful, there may be room for further improvement. It may be advantageous to create a list biased toward those with natural aptitudes for recruiting. A Marine with an R2 designator may be the equivalent of a predicted recruiting-expert and is therefore the best Marine to train and put in the field to stalk his or her assigned area (Griesmer, 2006).

The system of assigning recruiters is a wide net and the selection process may benefit MCRC if initiated earlier than between a current set of orders. The idea of using existing HR architecture is not novel as past performance is already considered. Ulrich states, "[a]n HR organizational diagnosis turns an HR architecture into an assessment tool" (1997, p. 213). The architecture as mentioned by Ulrich (1997) could be the R2 tool within MOL as the natural option during the proficiency and conduct mark recommendation and certification process for Corporals. The R2 too can be included in APES but similar to the certification for Good Conduct Medals where annual assessment align to fitness reports for sergeants (March), staff sergeants (December), and gunnery sergeants (June).

The use of the R2 tool by recruiters may also serve as an assessment of leadership for those within MCRC or desiring to return to MCRC. The frequency and fidelity of former or current 8411s in marking Marines as R2 could serve as a quantitative metric for selecting 8412s or 4810s. The use of R2 opens the aperture of adding value with respect to *who* is identifying talent among the Fleet within the USMC for MCRC. Marines with a talent of spotting talent in others is valuable information.

If adopted, a future analysis should reveal productivity of R2 recruiters compared to non-R2 recruiters. Statistical analysis would prefer a control group thus if R2 is adopted, at least 50% of any given FY recruiters school cohort should not be R2. My prediction is R2 recruiters will yield an increase in quality and quantity enlistments. This added recruiting HR tool in MOL can provide the CG of MCRC and the Commandant another combined arm to compliment and reinvigorate Total Force Recruiting (MCO 1130.56D, 2009).

2. Adopt "Enriched" as the Key Description

Marines are smart and know the word challenging all too well. Re-branding recruiting duty as an "enriched" job with independent tasks and dynamic responsibilities may remove some of the sticker shock the word challenging carries when used in isolation. Millennials do seek challenge. Describing recruiting with an optic that emphasizes independence, communication skills, and opportunities via the ability to connect with others that enables a recruiter to facilitate opportunities for others (service) may draw interest and increase recruiting duty volunteerism. The recruiters and MCRC should benefit if self-selection to the duty increases by re-branding recruiting duty as an enriched job (Lazear & Gibbs, 2015, p. 158). The use of *enriched* should be thoroughly coordinated on USMC websites and used by Manpower Management, career planners, Sergeants Major, and monitors.

A job categorized as enriched is most likely different from narrower jobs that Marines are likely to come from within the Fleet. Recruiting is an outstanding tour of duty that requires multitasking in a complex and unpredictable environment that offers outstanding opportunities for intrinsic motivation (Lazear & Gibbs, 2015, p.170). Intrinsic

motivation is a high order of motivation and usually requires a challenging job to satisfy the job seeker. Recruiting duty can fill this need for intrinsic motivation via the need for skill variety (multiskilling between sales and people), task identity (from stranger/contact to Marine), task significance (survival of the USMC), and while being mentally challenged (Lazear & Gibbs, 2015, p. 171–3). As mentioned by Lazear and Gibbs (2015, p. 199), "Aligning the worker's motivation with policies or goals of the firm is an important issue. This is where the policy and the internal labor market of MCRC assigning or seeking recruiting duty volunteers, can make minor adjustments and connect Marines' underlying motivation: the opportunity to self-select to an enriched job."

C. RECOMMENDATION FOR FUTURE STUDY

This thesis reveals a need to analyze DEP attrition in a panel data analysis of individual recruiter DEP pool attrition and the recruiter's individual discount rate with credit scores serving as a proxy. High DEP attrition may be a result of hard sales or lower quality contracting due to a behavioral response in avoiding the negative consequences of missing the current mission at the expense of the future. This behavior is similar to pay-advance loans, post-dating checks, or accumulating large sums of debt. The result of this kind of recruiter behavior will likely lead to high DEP attrition. Many Marines, to include NCOs, lack strong personal finance knowledge where the effects may manifest as a correlation when assigned to recruiting duty by lacking a sense of the future value of debts and investments (Hattiangadi et al., 2004). The personal discount rate of a recruiter as it applies to money may have predictive power as to the investment recruiters make later in their careers as recruiters in contracting as it relates to their personal discount rate of quality or quantity contracting.

D. CLOSING

The Marine Corps excels in selling the intangible aspects of being a Marine. It is fitting that Lieutenant General V. "Brute" Krulak (1984) references Shakespeare's St. Crispin's Day Speech at Agincourt having titled chapter 11, "This Precious Few," in his book about the preservation of the U.S. Marine Corps, "First to Fight." The chapter ends with, "…-A Band of Brothers" (p. 174). There is history, investment, honor, passion, and

a heraldry passed from Marine to Marine. Pride accompanies the time spent with fellow Marines leaving few artifacts lest scars, battle ribbons, the rare monument, and a lifetime of memories. Unit reunions are a testament to the power of the bonds of Marines as organizations. The first contact between an uninformed and high-quality military-age youth in the market and a highly screened and capable Marine Recruiter are critical for survival. High-quality youth seek the Marine Corps Brotherhood among the many choices available because of the intangibles the USMC so uniquely offers for those with the mettle to enlist.

APPENDIX A. REENLISTMENT AND SCREENING TIME

Routing Chain	**Time in Hours**	**Notes**
Marine Initiates	1.5 (*2)	Travel included
Career Planner action	1 (*2)	
Med/Dental	1(*2)	
S-3	0.25 (*2)	Ht/Wt, etc.
S-2/Security Person	0.25 (*2)	Verify clearance
SACO	0.25(*2)	
Legal	0.25(*2)	
SNCOIC	0.25(*2)	Usually quick
OIC	0.5(*2)	
Combat Camera	4(*2)	Tattoo Pictures, even if none
First Sergeant	0.5(*2)	
Company Commander	0.5(*2)	
Sergeant Major	0.5	
Executive Officer	0.25	
Commanding Officer	0.25	
Career Planner	1	
	23.5	Total Hours Bn/Sqdn
HQMC	estimate 2.5 Hrs min	Monitors
Total Hrs for 1 RELM	**26**	**Conservative Estimate**

(*2) Denotes the Marine and the Person in the Routing Chain.

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APPENDIX B. DATA GRAPHICS

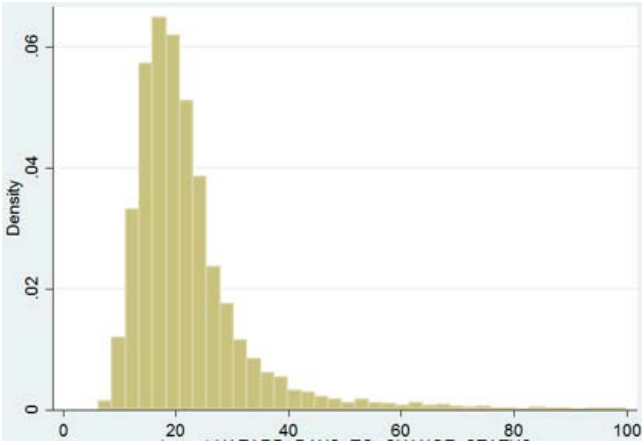

Figure 11. Mean days between contracts per recruiter: 2007 to 2017 (truncated to less than 120 days).

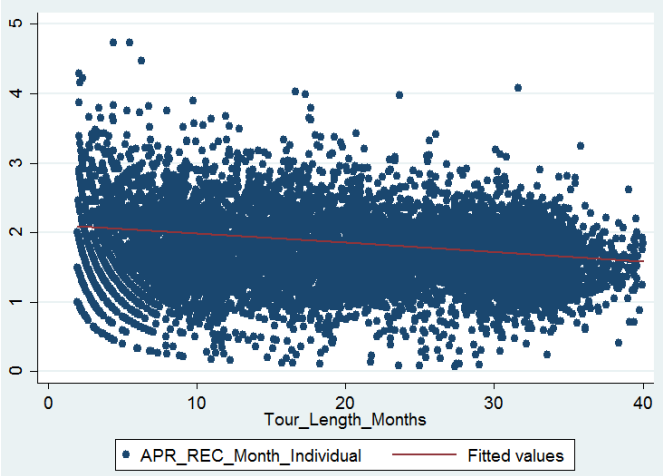

Figure 12. APR over time

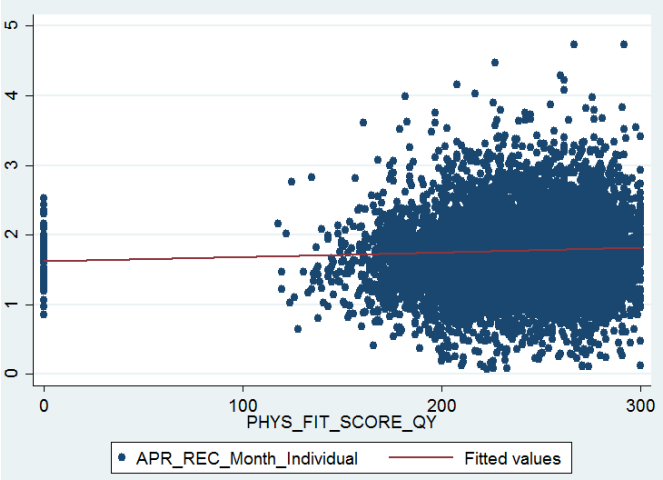

Figure 13. APR to recruiter PFT

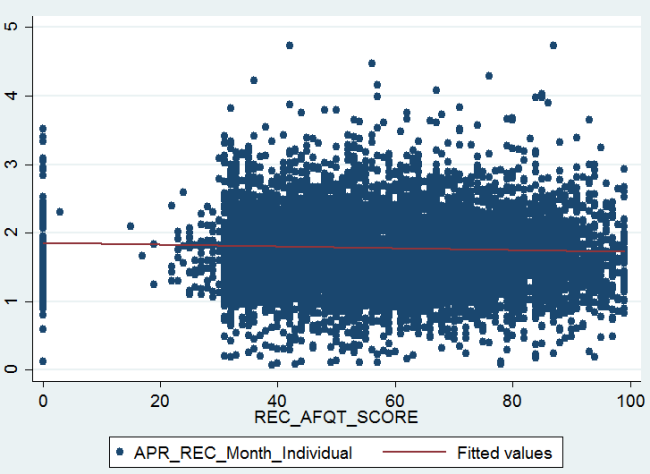

Figure 14. APR to recruiter AFQT

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