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THESIS

EFFECTS OF COMMUTING DISTANCE ON PARTICIPATION RATES FOR OBLIGATED SELECTED MARINE CORPS RESERVES

by

Jennifer A. Alstat

December 2017

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This research is conducted at the request of Reserve Affairs Personnel Policy, Plans and Programming (RAP-2), Reserve Affairs Division, Manpower and Reserve Affairs, Headquarters Marine Corps, to examine potential drivers for the high rate of attrition at the conclusion of a Reservist's initial obligation period. We examine if probability of attrition is correlated with the distance a Marine travels to his or her Reserve Training Center. The sample population includes United States Marine Corps Reservists serving in the Selected Reserves with six or more years of satisfied service.

We examine the likelihood that an enlisted non-prior service (NPS) Selected Marine Corps Reserve (SMCR) Marine who lives greater than 100 miles from his or her Reserve Training Center continue will serve past the initial six-year obligation. The analysis includes logit models analyzing the distance variables categorized into four groups: 0–25 miles, 26–50 miles, 51–100 miles, and anything over 100 miles. We find that distance over 100 miles is not correlated with attrition compared to those who live under 25 miles from the training center. The commuting distance that has the highest odds of attrition is between 51 and 100 miles.

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ABSTRACT

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LIST OF ACRONYMS AND ABBREVIATIONS

AC   Active Component
ADT   Active Duty training
AFQT   Armed Forces Qualification Test
AR   Active Reserve
ASAVB   Armed Services Vocational Aptitude Battery

BIC   billet identification code

CMC(RA)   Marine Corps Reserve Affairs Division
COMMARFORRES   Commander, Marine Forces Reserve
CONUS   continental United States

DMDC   Defense Manpower Data Center
DOD   Department of Defense
DODD   Department of Defense Directive
DODI   Department of Defense Instruction

HOR   Home of record
HQMC   Headquarters Marine Corps

IADT   Initial Active Duty Training
IDT   Inactive Duty Training
IIADT   Incremental Initial Active Duty Training
IMA   Individual Mobilization Augmentee
IRR   Individual Ready Reserve
ITB   Infantry Training Battalion

MAGTF   Marine Air Ground Task Force
MARADMIN   Marine Administrative Message
MARDIV   Marine Division
MARFORRES   Marine Force Reserves
MAW   Marine Air Wing
MCO   Marine Corps Order
MCRAMM   Marine Corps Reserve Administrative Management Manual
MCRC   Marine Corps Recruiting Command
MCRD   Marine Corps Recruit Depot
MCT   Marine Combat Training
MCTFS   Marine Corps Total-Force System
MEPS   Military Entrance Processing Station
MLG   Marine Logistics Group
MLR   Multivariate linear regression
MOS   military occupational specialty

M&RA	Manpower and Reserve Affairs
MSC	major subordinate command
MSO	military service obligation
NPS	non-prior service
ODSE	Operational Data Store Enterprise
PEF	program enlisted for
RA	Reserve Affairs
RAP	Reserve Affairs Personnel Policy, Plans, and Programming
RC	Reserve Component
SELRES	Selected Reserves
SES	Socioeconomic status
SMCR	Selected Marine Corps Reserve
SNCO	Staff Noncommissioned Officer
USMC	United States Marine Corps
USMCR	United States Marine Corps Reserves

EXECUTIVE SUMMARY

A. PURPOSE

The primary focus of this study is to determine if there is a relationship between distance from a Marine's assigned Reserve Training Center (RTC) to their current address and continuation rates within the USMC Reserves. This study also analyzes the distribution of commute distance among first term enlisted Marine Reservists and if it varies by observable characteristics. Each of the major subordinate commands (MSC) is composed of several different units and are dispersed throughout the United States. Increasing the recruiting radius farther than 100 miles from the unit's location could potentially improve the quality of Reservists recruited. The Marine Corps Reserve Affairs Division (CMC (RA)) must determine if attrition and distance are significantly correlated in order to determine if they should explore this option.

B. BACKGROUND

There are 30,500 Selected Marine Corps Reservists (SMCR) assigned to one of the 279 units located at one of 160 Reserve Training Centers (RTC). These RTC are located in 47 states, the District of Columbia and Puerto Rico. One major difference between the Active Component (AC) and Reserve Component (RC) recruiting process is a RC Marine is recruited to a specific Billet Identification Code (BIC) instead of Program Enlisted For (PEF) code. In other words, reserve Marines are recruited to fill a particular space in a reserve unit, whereas AC Marines sign up for a particular MOS and the unit assignment comes later. Not all RTC have a need to fulfill every MOS in the MAGTF so recruiting to a specific BIC is critical. If there is no available BIC, there is no need for an additional Marine. The recruiting distance is generally limited to a 100 mile radius from the RTC. The initial six year obligation can bring many changes to the Marine's life, including marriage and family. All of these will play a role in the decision to continue serving past their initial obligation period; however, the focus of this study will only be on the effects of commuting to their RTC.

As of now, the United States Marine Corps (USMC) has not studied commuting distance and living situations and its effects on retention. As Reservists change individual careers over their initial obligation period, their commuting distance is subject to change. Referencing what previous Naval Postgraduate School officers have discussed on retention and publicly published articles allows the USMC to focus first on understanding the problem of commuting and its effects on personal decisions to continue serving in the SMCR. It also provides insight for the reformation of the current travel reimbursement policy for future Marine Corps Reservists. Lastly, this study allows leaders at Headquarters Marine Corps (HQMC) to make informed decisions on whether or not to adjust the current policy on recruiting efforts.

C.   FINDINGS AND CONCLUSIONS

The data in thesis comes from the National Bureau for Economic Research and Reserve Affairs Personnel Policy, Plans, and Programming. The data contained 4.7 million observations and was pulled by monthly sequences starting from January 1, 2000. I start the analysis by keeping only the last observation per Marine. This allows me to deduct the point of attrition and gather a more accurate representation of the demographics for the obligated population. I also remove any missing zip code information, officers and those with less than six total satisfied years. The remaining sample consists of 38,214 Reservists serving six years or more in the SMCR. I use a logistic regression in the analysis to estimate the effects of distance on retention of SMCR first term enlistees. The reference group for comparison is a single, white, male, in a support MOS with a high school diploma from the Pacific region who has earned the rank of Corporal and lives under 25 miles from his RTC

We found a commuting distance of over 100 miles to the RTC does not significantly affect attrition of Marines at the conclusion of their initial obligation period. Those who live over 100 miles are, overall, less likely to attrite than an individual who lives less than 25 miles from their RTC. In contrast, individuals that live between 51 and 100 miles have higher odds of attriting compared to those within 25 miles. The effects of

commuting distance amplify the odds of attrition if the Reservist did not achieve the rank of Corporal, however are slightly lower if they achieved Sergeant or SNCO.

D.   RECOMMENDATIONS FOR FURTHER RESEARCH

My study focuses only on statistical data and does not highlight personal reasons why a Marine chooses not to continue to serve. In my analysis, being married was not a statistically significant factor; however being divorced or having dependents was. Being divorced or having at least one dependent overall lowered the odds of attrition. What was not identified was if that dependent was also considered their spouse or a child. In order to gather a complete picture, it is my recommendation to conduct the following: a study surveying Marines on why they no longer desired to serve in the SMCR, and/or to develop a HQMC driven system that captures exit surveys of why a Reservist desires to no longer serve after their mandatory participation is complete.

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I.   BACKGROUND

A.   PURPOSE

As of now, the United States Marine Corps (USMC) has not studied commuting distance and Marines' living situations and its effects on retention. As Reservists change individual careers over their initial obligation period, their commuting distance is subject to change. Currently, there are 30,500 Selected Marine Corps Reservists (SMCR) located in 47 states, the District of Columbia and Puerto Rico. Approximately 1,800 to 2,300 Marines exit the SMCR after their initial obligation of six years. Almost 70% of the enlisted Marines who enter on a 6x2 contract exit after six years. That leaves only 30% to fill the billets within the SMCR. Reserve Affairs Personnel Plans, Policy and Programming (RAP) is looking for reasons why this statistic is so high and this research is an attempt to assist them in determining if commuting distance could be a reason.

The primary focus of this study is to determine if there is a relationship between distance from a Marine's assigned Reserve Training Center (RTC) to their current address and continuation rates within the USMC Reserves. I also analyze the distribution of commute distance among first term enlisted Marine Reservists and if it varies by any observable characteristics. Referencing what previous Naval Postgraduate School officers have discussed on retention and publicly published articles allows the USMC to focus first on understanding the problem of commuting and its effects on personal decisions to continue serving in the SMCR. Lastly, this study allows leaders at Headquarters Marine Corps (HQMC) to make informed decisions on whether or not to adjust the current policy on recruiting efforts or travel reimbursement.

B.   COMMAND STRUCTURE

The reserve component allows the USMC to rapidly expand to meet the Combatant Commander's needs. Specifically, the mission statement of the USMC Forces Reserve describes their purpose to "augment and reinforce active forces for employment across the full spectrum of crisis and global engagement" (U.S. Marine Corps Force Reserve, 2017a).

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Lieutenant General Brilakis, former Deputy Commandant for Manpower and Reserve Affairs, signed the updated Marine Corps Reserve Administrative Management Manual (MCRAMM) on 23 December 2015. Chapter 1 of the MCRAMM outlines the organization of the Marine Corps Reserve. The Marine Corps Total Force consists of an Active Component (AC) and a Reserve Component (RC). The Selected Reserve (SelRes) and the Individual Ready Reserve (IRR) organize the RC.

The SelRes consists of the Active Reserve (AR), SMCR, Individual Mobilization Augmentees (IMA), and the Initial Active Duty for Training (IADT) components (see Figure 1).

Organization of the Marine Corps Reserve
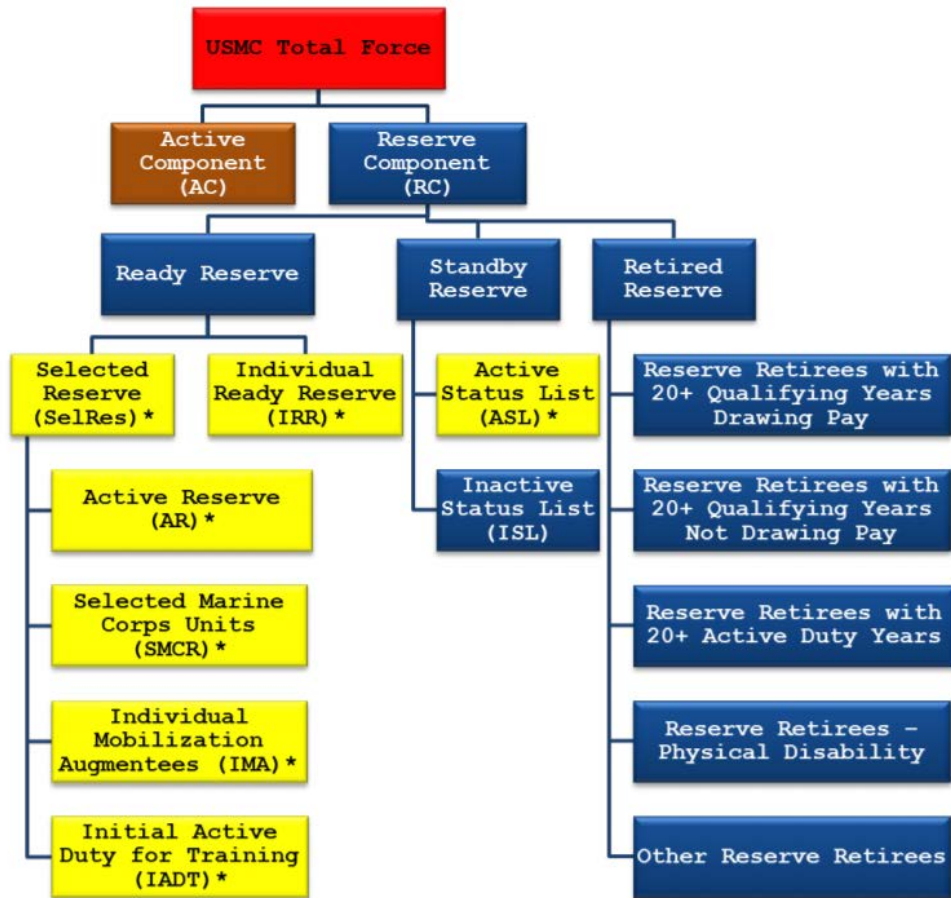
Note: Components highlighted in yellow (and annotated by an "*") are elements of the Reserve Active Status List (RASL).

Figure 1.   Components of the Marine Corps Reserve. Source: CMC (2015).

Under COMMARFORRES there are four MSCs 4th Marine Division (4th MarDiv), 4th Marine Aircraft Wing (4th MAW), 4th Marine Logistics Group (4th MLG), and the Force Headquarters Group (see Figure 2). The RC has the same Marine Air Ground Task Force (MAGTF) capabilities as the AC, in order to augment or reinforce the AC. There are 279 units dispersed across 160 Reserve Training Centers (RTC) in 47 states, the District of Columbia and Puerto Rico serving approximately 30,500 SMCR Marines (U.S. Marine Corps Force Reserve, 2017b).

Figure 1-2.--Organization of the Marine Forces Reserve (MARFORRES).

Figure 2.   .Major Subordinate Commands under COMMARFORRES.
Source: CMC (2015).

For a more detailed description of the command structure and organization of the Marine Corps Reserve, reference NPS theses by O'Donohue (1988), Herschelman (2012), Brisker (2014), Volkmann, Shapiro, and Barnes (2014) and Norton (2015).

C.   RESERVE AFFAIRS DIVISION ACCESSION OVERVIEW

CMC (RA) primarily focuses its recruiting efforts on two categories: prior service (PS) accession and NPS accession (Commandant of the Marine Corps [CMC], 2016). Marines that have never served in the USMC are classified as NPS Reservist and make up about two-thirds of the RC (CMC, 2016). Marines who have successfully completed their AC contract requirements and are continuing their service in the RC are classified as a PS Marine. PS Marines are joined to the Reserves in relation to their geographical proximity of the nearest RTC in which the Marine resides after exiting the AC, if the RC has a need for that military occupational specialty (MOS), and if the Marine left the AC honorably.

One major difference between the AC and RC recruiting process is a RC Marine is recruited to a specific Billet Identification Code (BIC) instead of Program Enlisted For (PEF) code. Reserve Marines are recruited to fill a particular space in a reserve unit, whereas AC Marines sign up for a particular MOS and the unit assignment comes later. Not all RTC have a need to fulfill every MOS in the MAGTF so recruiting to a specific BIC, or job, is critical. If there is no available BIC, there is no need for an additional

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Marine. This is the main recruiting benefit because it allows the individual to remain in their current location but still have the benefit of serving in the Marine Corps. If, after graduating from recruit training, they do not meet the qualifications of their contracted MOS, the Marine will be reclassified to another MOS in order to fulfill a BIC within a responsible commuting distance to their RTC.

As stated in CMC (2016) on page 2-1, "Anyone inducted, enlisted, or appointed in the Armed Forces on or after 1 June 1984, incurs an eight-year period of obligated service." This is also known as Military Service Obligation (MSO). For the RC, the MSO is served in the SMCR in four, five, or six year blocks, with the remaining time served in the IRR. These blocks are determined primarily by how many hours of IADT the Marine will undergo or if they are enlisting in the Incremental Initial Active Duty Training (IIADT) program. Since most all Marines receive a cumulative of at least 20 weeks of IADT between recruit training, Marine Combat Training (MCT) or School of Infantry (SOI) and their MOS school, they are limited to the 6 x 2 contract. In a 6 x 2 contract a Marine serves six years in the SMCR and the remaining two in the IRR (Commandant of the Marine Corps [CMC], 2015).

To assist in attracting highly qualified NPS individuals, the IIADT program was designed. This allows the individual to split the time it takes to complete all initial training over two or three summers while still attending their educational institution during the fall and winter months. The individual would attend recruit training one summer, MCT school the next and MOS the third summer (CMC, 2015). No Marine is deployable until all IADT has been complete, so under this program a RC Marine is non-deployable for up to 3 years but still being charged against a unit's strength report. Taking this into consideration, no more than five percent of the enlisted NPS mission and ten percent of each SMCR unit mission will be accepted into this program (CMC, 2015).

1. **IADT**

The career of a USMC Reservist begins the same as an AC Marine (CMC, 2016), at the doorsteps of a recruiter's office. The interested individual works with a recruiter and is verbally screened for any medical, moral, physical, educational, or age

disqualifications prior to signing a contract. Upon successful verbal screening the individual signs a contract that states their desire to enlist in the Unites States Marine Corps Reserves (USMCR). Once the contract is signed, the individual goes to a Military Entrance Processing Station (MEPS) for a more thorough medical, physical, and educational screening (to include taking the Armed Services Vocational Aptitude Battery [ASVAB]). This individual goes to MEPS at least twice prior to attending recruit training, once for initial screening and again for a final screening the day prior to leaving for recruit training. All female recruits depart MEPS and go to Marine Corps Recruit Depot (MCRD), Parris Island, SC for their recruit training. Males recruited east of the Mississippi River attend MCRD, Parris Island, SC and those recruited west of the river attend MCRD, San Diego, California.

Upon graduation from their respective 13-week recruit training, the Marine receives 10 days of leave before reporting to the School of Infantry (East/West) for either MCT or Infantry Training Battalion (ITB). MCT is a month long training course where Non-combat assigned Marines MCT learn basic combat skills. Upon successful completion of MCT the Marine attends their follow-on MOS school. If the Marine is contracted to an infantry MOS they will not attend MCT but instead go directly to ITB for their combined initial combat and MOS specific training.

2. Post-IADT

Once all formal training is complete the Marine returns to the geographic location of their RTC where they will participate in drill one weekend a month and two consecutive weeks a year while attending college or working their civilian career. The Marine will attend 48 drill periods called Inactive Duty Training (IDT) and 14 days of Annual Training (AT) each year for the next six years. While six years may not seem like a long time, drastic changes can happen over that time.

The average age of an individual entering the SMCR from the data population in this study is 19.7 years old. By the time they ship off to recruit training they will have just graduated high school, are most likely not married yet and have not given their future a lot of thought. These individuals, like those who attend a military academy, have just

made a major life decision that will affect them for the next six years. They have a commitment to the SMCR as a part time job to uphold no matter what changes in life occur. Four of those years could be spent earning a bachelor's degree or working 50 hours a week learning a vocational trade. The Marine could get married or start a family toward the end their contract without fully realizing how it will impact their SMCR commitments.

Assuming the Marine went to college, the next step in life is to find an employer within 100 miles of the RTC that is looking to hire his or her newly minted skill set. After the conclusion of these six years, the Marine is faced with a decision to remain serving in the SMCR or finish the last two years in the IRR.

D.   SUMMARY

As previously mentioned, Marines are recruited by BIC requirements at their closest RTC. The recruiting distance is generally limited to a 100 mile radius from the RTC. As defined in chapter 7 of CMC (2016), a Reservist needs approval to incur a commute that is greater than 100 miles. The initial six year obligation can bring many changes to the Marine's life, to include growing in the workforce, getting married and starting a family. All of these play a role in the decision to continue serving past their initial obligation period, however the focus of this study is only on the effects of commuting to their RTC.

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II. LITERATURE REVIEW

A. OVERVIEW

This chapter discusses the research focused on understanding commuting and retention. The first section of this chapter provides an understanding of the urban sprawl concept and how commuting distances is increasing across the United States. The next section reviews a study concentrating on long commutes and its effects on families. The third section reviews incentives offered for both the civilian sector and military. Lastly, this chapter reviews previous NPS theses on the USMCR and retention.

B. MODERN-DAY COMMUTING

1. Urban Sprawl

As a Reservist, there are many variables to consider when choosing a career, such as proximity of their home to the RTC and civilian job. Depending on the geographic region, an individual in the workforce may spend several hours a day commuting to work. In an urban area, a 30-mile drive could take over 2 hours during peak hours. Those individuals who are looking for a shorter commute may make the decision to transition to an employer who is located in a suburban area, thus creating the urban sprawl. Crane and Chatman (2003) explain this concept in their article when they examine the trends of suburbanized employment and commuting distances.

Crane and Chatman (2003) state cheaper land and the presence of a labor pool in the suburbs as reasons why employers chose to move out of the city. While employers hypothesize they can offer lower wages due to the reduced commute times their new location provides employees, those are not the only variables to consider. Other factors need to be considered that cannot be measured by numbers. The authors touch on three main categories of these particular variables.

The first category briefly explains why individuals are less likely to choose where to live based on job proximity. If an employee has any uncertainty in their future or has more than one worker in the household proximity to a place of employment is not likely

as important to them, within reason. Moving is costly and if a worker knows they will be changing jobs at any point in their future they are more likely to find a happy-medium that will satisfy several employment possibilities. Considering this, commute times may increase with decentralization of firms.

They also state a firm may not choose to suburbanize only to be closer to their work force due to benefits of lower taxes or proximity to external markets (Crane & Chatman, 2003). Property taxes decrease the farther out from a city an employee travels. If keeping expenses low are a priority for them, as it is for most firms, decentralization will not necessarily shorten a commute. The RTCs fit closely into this category, not necessarily for lower costs but instead for specialized training locations that are capable of accommodating specific units. It is not feasible to have a tank unit located near Chicago, Illinois as the Marines have very limited access to areas large enough to maneuver a tank. Instead, a location near Boise, Idaho is better suited for such a unit.

The final category describes other factors not related to employment, such as education, property values and amenities, which effects a household's decision. Some families base their residence on the amount of outdoor recreational activities are around them while others may put a higher priority on education. Because of these considerations, the decentralization of firms will not be a strong factor in reducing their commutes.

The study uses data from the American Housing survey from 1985 through 1997 and county level employment levels from the National Bureau of Economic Analysis. Their first hypothesis is as employment suburbanizes, commute duration should decrease. They also follow this with the hypothesis if an individual has greater uncertainty about their job location or if they would have a high moving cost to relocate, then their commute will most likely be longer. The AHS only collects commute distance and not time so their investigation does not take into consideration other factors such as congestion or the use of different transportation methods.

Their results are as hypothesized, despite all of the other potential factors complicating the research. As more business move to more suburbanized areas, the

average commute shortens, however, this is also industry specific. Commuting distances in the government industry tends increase, and depending on what industries and employment opportunities are near the Reservist's RTC this may affect their commute (2003). The authors conclude that even though suburbanization does decrease commutes, it does not explain why, on average, commute times and distances have increased over time (Crane & Chatman, 2003).

As more employers make the decision to branch out to more suburbanized areas, commute distances still continue to increase. Personal preferences to community amenities, education and property values will drive individual decisions where to reside over a shorter commute distance. Partridge, Ali, and Olfert (2010), describes each of these as variables used in their empirical study. The authors state similar reasons as Crane and Chatman (2003) on how individuals arrive at the decision to live farther away from their employer. Partridge et al. use consuming traded goods, housing, site-specific amenities and leisure time in their utility maximization function as part of their theoretical framework.

Partridge et al. (2010) focus on determining if out-commuting, synonymous with commuting, is based on an individual's preference to live in a rural area, while enjoying the benefits of urban employment or if it is a result of urban sprawl. Their literature review summarizes two explanations that might be beneficial in understanding why Marines choose to commute longer distances to their RTC. The first explanation is they are attracted to a specific community and the second being they eventually relocate closer to the urban place of employment. The regressions are based on the relationships between distances, demographics of the community and their past commuting patterns, with data collected from the 1991, 1996, 2001, and 2006 Censuses of Population in Canada. The authors create interactions between the distance to the nearest urban center and population growth in order to be able to fully capture the compromise between distance and effects of population growth. Their results were as predicted with the farther away the community is from the urban center, the less likely they will see the effects of suburbanization, or deconcentration. This coefficient goes on to reveal that population growth has 10 times the effects on out-commuting than job growth (Partridge et al.,

2010). Individuals in this study are choosing to live in an area that requires them to commute into an urban area because they want to, not because of the job market in that local community.

The authors grouped urban centers together by population size and those considered small or medium had less than 500,000 and large was anything over 500,000. They concluded the more remote an area, the higher the likelihood of out-commuting. They base this assumption on the possibility of the rural areas having a concentration of low paying industries which forces individuals to commute into the urban area for a better job (Partridge et al., 2010). The distance in which the population growth starts to diminish is approximately 118 km or 73.3 miles from the closest urban center, however like parts of the United States, remote areas experience more out-commuting so this distance could be increased (Partridge et al., 2010).

This study was conducted in Canada, with population centers similar to those found in the United States. Some areas were more remote while others had small to medium sized urban centers within 60 miles of each other. The findings of Partridge et al. (2010) could also be a predictor for this study, especially for the more remote RTCs in the western states.

2.   **Rural Employees**

Crane and Chatman's (2003) focus was on the urban sprawl and how suburbanization of employers has affected commuting distances. Even though they found decentralized employment decreased commuting distances, they also caveat it is industry specific and personal preferences will ultimately be the reason individuals have longer commutes. Partridge et al. (2010) turned their focus to determining if job growth or population growth had an effect on out-commuting in urban centers. Clemente and Summers (1975) falls under both categories with their earlier study of commuting patterns of employees of a rural northern Illinois steel plant. Prior to the research conducted by Clemente and Summers all studies relating to distance traveled to work had been conducted in metropolitan areas, primarily the business sector. Partridge et al. (2010) describe how remote rural areas are more likely to have a lower paying, lower

skilled industry that attracts workers who chose not to drive extended distances. This earlier study describes how both of these results are plausible.

Clemente and Summers (1975) conduct their research by examining commuting patterns of employees of a steel plant located in rural northern Illinois. The model previously used for computing metropolitan commutes included socioeconomic status (SES), age and the length of employment upon distance between pace of residence and place of work (Clemente & Summers, 1975). The authors' research attempts to determine if this generalizable model has the same results in a non-urban area. From these model inputs the authors state three hypotheses. The first is an individual's SES was directly related to the distance commuted to work. Second, the relationship between months employed at the plant and miles commuted is inversely related. Finally, an individual's age and miles driven are inversely related.

The results of their analysis lead them to reject all three hypotheses. None of the independent variables had an impact on the distance traveled. The authors continue to point out their research in a rural area did not follow the same patterns as previous studies in an urban environment. These inconsistencies could be a result of the difference in metropolitan structure. Unlike urban areas where housing is almost continuously available, the authors pointed out the surrounding towns and villages served as housing nodes. The mean distance traveled in this rural area was approximately 20 miles with a standard deviation of 11 miles (Clemente & Summers, 1975). With these distances, they found residents were scattered throughout 68 different housing locations. There are RTCs in less populated areas and this study could assist in predicting if similar patterns exist with SMCR Marines.

Commuting distances have continued to increase whether it is by choice or by necessity. If a Marine's primary civilian career is taking them to an urban center, it is likely their commute to their RTC will also increase. Personal preference to community amenities, property values and the decentralization of employers are all factors that complicate the decision on where to grow roots.

C. FAMILY FACTORS

Family and quality of life are always factors in the decision to accept a new position and adding a long commute on top of that may be too much. If they chose to take a position farther away the onus is on them to drive back for drill or be transferred to a closer location. The problem with being transferred is they are not guaranteed to have a billet available for them and end up in serving in a role for which they are not fully qualified. The Marine can always request to be recoded, or laterally move to another MOS. This process requires the Marine to submit a formal request to HQMC for approval, and if approved, they attend a new MOS school. On the opposite side, there is also a possibility the Marine enjoys his current unit and would like to remain in his billet, but has a civilian opportunity he feels he cannot pass up. If this distance is significant it could potentially have a negative impact on the Marine's family, which would impact the decision to serve past his initial obligation. As previously mentioned, commuting distances are on the rise and more and more families adjust to follow the best job market. This involves significant commutes or even becoming geographical bachelors (Geo-Bachelor), where one member lives very close to the place of employment while the family remains at a different location.

Landesmad and Seward (2013) recognize most studies on commuting were only on the distance to and from employment; however, few studies examine "mega commutes." With more and more Americans commuting longer distances, it is important to understand how this affects the relationships within the household. In our modern world, it is becoming socially acceptable for a family to live apart for extended periods and Landesmad and Seward (2013) highlight the affects it has on a family in their article. Job markets fluctuate and some are forced to find employment farther away from their residence. In some cases their employer has told them they are being relocated and rather than moving their family they become families who are "living apart together" (Landesmad & Seward, 2013, p. 767). The Marine Corps coins this term as being a Geo-Bachelor. A common situation where the Marine decides to become a Geo-Bachelor is if the Marine has orders but they are for a short time; or the family is in a position where

they feel it is best for the Marine to be the only one to go (i.e. not moving the senior in high school 3 months before graduation).

Landesmad and Seward (2013) use a survey method to gather information from respondents on their demographics, how they view their relationship prior to and after becoming a commuting family, and their view on commuting. All of the respondents have to be a couple and are categorized based on whether one or both had a long commute. Those couples where neither had a long commute are classified as being a non-commuting couple. They also ask respondents to rate their attitude on traditional gender roles. This is an interesting point that allows them to determine if an individual saw household tasks as gender neutral roles, they were more likely to be able to cope with the commuting burden, especially if the couple had children (Landesmad & Seward, 2013). Knowing your partner is at home caring for the children can make the other feel rushed and anxious during the commute because of the anticipation of seeing the family and feeling the need help the partner.

The results of this study state individuals who are fully committed to their family activities when they are home are more likely to have a higher spouse satisfaction rating (Landesmad & Seward, 2013, p. 773). Having young children in a relationship can be stressful, especially if there is more than one. Knowing your partner is not always there to assist in taking care of the children can make things even more stressful, especially for younger parents. Given these results, the burden for a Reservist to commute a longer distance in order to fulfill their drilling obligations might explain why attrition is so high after six years.

The SMCR in this study consists of 65.96% single individuals and 95.8% males and while the demographics of this study are significantly different, the results are still worth noting. A male may enter the SMCR as single, but over his first six years, he may get married. It is also worth noting while a Reservist only has an obligation one weekend a month and two consecutive weeks out of a year, they still incur time away from family and a commute that may require them to remain the RTC all weekend. Ensuring the Marine and his family have the support they need from their chain of command could be

pivotal in the Marine's decision to remain in the SMCR, especially if they have a long commute.

D.   EMPLOYER INCENTIVES

Employers have taken notice of the increasing commutes and have added in compensation for commuting in their recruitment efforts to hire the best individuals. According to the bureau of labor statistics, seven percent of all workers in the labor force are offered a subsidy toward commuting (Bureau of Labor Statistics, 2016). In Silicon Valley, California employers like Google, Yahoo and Ebay have started their own shuttle program to assist in increasing quality of life as part of their benefits package (Helft, 2007). Google understands individuals cannot afford to live near Silicon Valley and with highway traffic becoming gridlock by 8:00 a.m., it offers an hour of free travel to and from work. The employees have access to wifi and many begin their work day on the shuttle so essentially Google is getting another hour of work out of them.

Several employees interviewed for the article stated they would rather lose their benefits of free food at Google than have the shuttles stopped. When interviewing for a position, one employee interviewed openly admitted to basing his apartment choice on how close he was to one of the shuttle stops in San Francisco, California (Helft, 2007). In the same article, Helft (2007) briefly describes how Facebook's housing incentives are designed to remove (or significantly reduce) the commute. He states Facebook offers a $600 a month stipend to those who live within a mile of their headquarters in Palo Alto, California. While Facebook is incentivizing their employees to live closer to reduce the stress of commute, Google completely removed it.

These companies in Silicon Valley are not the only ones who have offered competitive commuter benefits to their employees. Similar to the civilian workforce, the USMC is constantly developing innovative ways to recruit and retain high quality Marines. Marine Administrative Message (MARADMIN) 475-17, titled *Inactive duty training (IDT) travel reimbursement* was signed on 28 August 2017 and outlines how certain high demand MOSs can earn up to and extra $300 per round trip if they live farther than 150 miles from the RTC.

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E.   MILITARY STUDIES

Several theses at the Naval Postgraduate School (NPS) cover various factors relating to the recruitment and attrition of Marines within the active and reserve components.

Fergerson's (2016) thesis examines the geospatial relationship of all Marine Corps Recruiting Command (MCRC) locations, USMC installations, detachments and independent duty locations to the quality of enlisted accessions. His analysis includes a multivariate linear regression model to determine the effects of distance and a logit regression to determine the probability of accessing high quality individuals. His independent variables in the multivariate linear regression model includes the standard demographic controls of race, gender, high school education, marital status as well as variables for distance rings. His distance rings are similar to those in this study as he uses mileage of 11–25 miles, 26–50 miles, 51–100 miles and anything over 101.

The results of his study indicate there is a difference in quality between active duty location and MCRC locations. His results illustrate a difference in active recruiting, typically in more rural areas, and passive recruiting in areas closer to an active duty location. The enlisted accessions located under 25 miles or over 100 miles from an active duty location perform better on the Armed Forces Qualification Test (AFQT). The results for the differential effects of distance from active duty locations provide evidence the highest quality accessions are females within a 10-mile radius (Fergerson, 2016).

Herschelman's thesis (2012) focuses on predicting factors for attrition of first term USMCR. He categorizes his data in three cohorts dependent on when then entered, Pre-9/11, overlap-9/11 and after 9/11. Of the three cohorts his analysis depends heavily on if the Marine has deployed, in addition to the usual demographics, as predicting factors to attrition. His multivariate data analysis includes the RTCs by geographic region as defined by the U.S. census as a variable with the northeast states used as the base region in his probit models. Regions that experience higher rates of attrition for the latter cohorts (2002–2005) are only the Southeast and Pacific (Herschelman, 2012). His unrestricted probit model includes those without an outside of the Continental United

States (OCONUS) deployment and all cohorts from 1995-2005, finds the Western Mountain, Southeast, South Atlantic and Western Midwest regions all more likely to attrite than the base Northeast region (Herschelman, 2012).

The Western Midwest is more spread out which requires more of a commitment and commute to get to and from drill every month. However, the Southeast is even more likely than the Western Midwest to attrite so it may also be plausible distance does not make that much of a difference. While Herschleman's analysis includes regions as a variable, he does not focus on distance as a consideration.

F.   CONCLUSION

This chapter highlights the increasing trend of commuting within the United States as well as potential reasons why individuals would choose to live farther away from their place of employment. Community amenities, school districts, property values and personal preference are all decision that affect comminuting in this country. Extensive commutes can put an additional strain on a family, but as it becomes the norm more and more households are finding ways of making it work for them. Incentives have shown to increase the recruitment and retention of high quality employees, and may be worth exploring in the future. The background given to us on recruitment from Fergerson (2012) and attrition from Herschelman (2012) remind us there are several individual factors that play a role in the entire cycle of maintaining a balance in personnel. This thesis addresses some of the same commuting, demographic and family issues discussed in the previous studies but with a focus primarily on the distance to their RTC.

III. DATA AND METHODOLOGY

Here I describe the data used in our regression models as well as the construction of the key independent variables. I also explain each independent variable's relevance to the study. I conclude by explaining the regression models used in this analysis.

A. DATA

This study uses data from RAP and the National Bureau for Economic Research. The sample contains 4.7 million observations with multiple observations per Marine because the data pull is sequenced monthly starting from January 1, 2000. I start my analysis by utilizing only the last observation per Reservist. By using the last observation, I am able to deduct the point of attrition for each Marine and gather a more accurate representation of the demographics for the obligated population.

The data is further compressed by removing those who enlisted prior to January 1, 2000 and after July 31, 2011 and if the total satisfied years was less than six. Lastly, I drop those individuals who are missing a current address zip code or RTC zip code from the data set, resulting in 38,214 remaining total observations.

B. DEPENDENT VARIABLE

The dependent variable is *attrite* which equals one if the Reservist transferred to the IRR or, zero if the Reservist remained past six years. My first step is to code the data to reflect which sequence it belongs to and then I apply a filter to keep the last observation per Marine. I create the indicator variable *attrite* from the *total satisfied year* field and recode anything over 6 years =0 and years 6=1.

C. INDEPENDENT VARIABLES

1. Distance

Distance is the miles from the Reservist's current address and their RTC. As stated in the MCRAMM, a reasonable commuting distance is any place within a 50 mile radius of the RTC (CMC, 2016). Any distance outside of a 100 mile ring from the RTC

will require a waiver signed by their unit's CO. If a Reservist is required to travel more than 50 miles for IDT the USMC provides per diem for meals and quarters (CMC, 2016). I calculate the distance for each of these variables by merging the zip code database from The National Bureau of Economic Research (Roth, 2014) with the zip code data from RAP.

a.   Current address

The current address zip code will paint a picture of the Reservist's current commuting distance. I create indicator variables to measure the distance from the Marine's current address to the RTC. These are binned into four categories. From zero to 25 miles will be *dist25*, *dist50* for 26–50 miles, *dist100* is 51–100 miles, and finally any distance past 101 miles is *dist101*.

b.   RTC address

The RTC zip code determines the location of the particular training center that a Reservist is assigned to within the United States. This will be the location in which the distance to the current address is measured from.

c.   Geographic regions

As previously mentioned, Reservists enlist close to their parent's hometown but often move out on their own within a few years. This study divides the U.S. into 9 geographic regions to be in line with the U.S. census designations. The regions include: *New England, Middle Atlantic, South Atlantic, East South Central, West South Central, East North Central, West North Central, Mountain, and Pacific*. These regions determine if one is more resilient to commuting longer distances than the other. Figure 3 depicts which states are in each region.
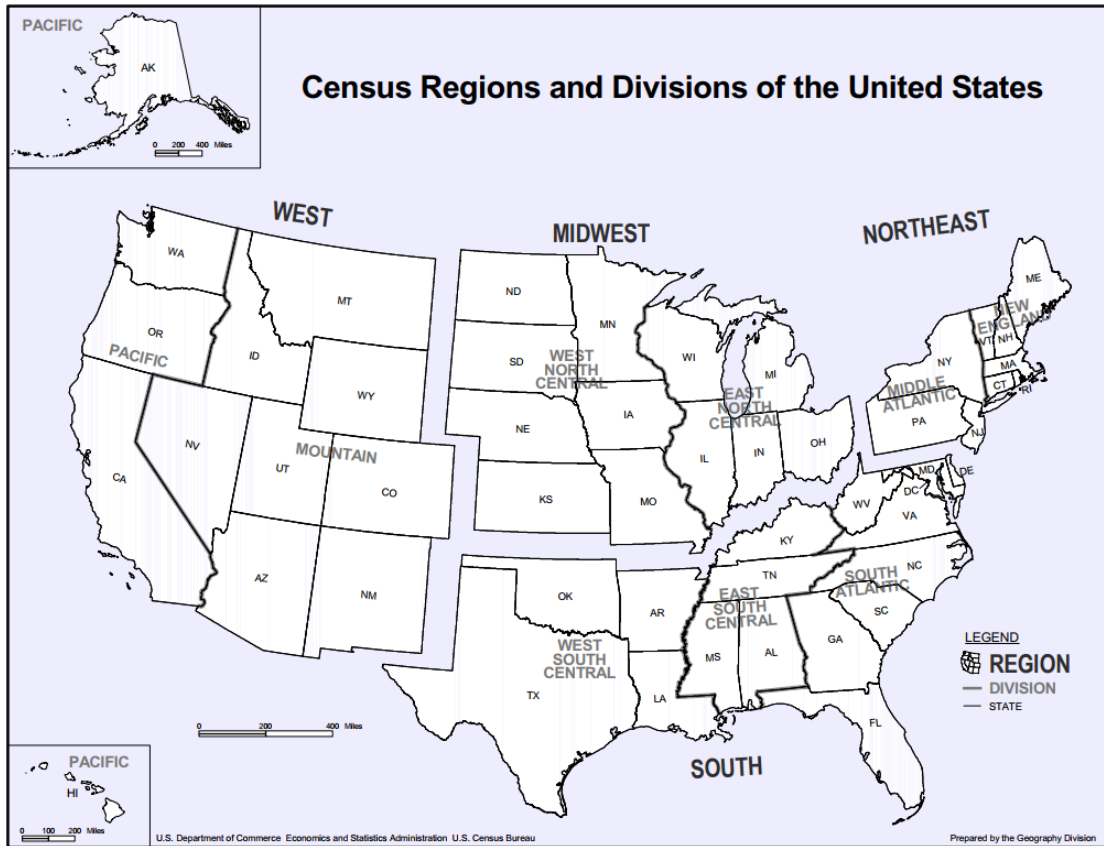
Figure 3. Census Regions and Division in the Unites States. Source: U.S. Census Bureau (2010).

2.   Personal Demographics

a.   *Gender*

A binary variable *female* is included to capture the effects that gender may play in attrition. In previous military studies, females have found to have higher attrition rates than males. The Department of Defense (DoD) and the USMC recently lifted all MOS restrictions on females serving in ground combat related occupations. Continuing to study female attrition rates in all aspects of the military will assist policy makers and planners in making informed decisions.

b.   Race/ethnicity

In this data set, the RAP raw data provides six race/ethnic codes: American Indian or Alaska Native, Asian, Black or African American, native Hawaiian or other Pacific Island, White and Declined to Respond. For the purposes of this study, there is only a category of *white* and *non-white*. I categorize the Reservists who did not respond at all into the *non-white* category.

c.   Marital status

This thesis uses the variables of *single, married* and *divorced* to determine if the relationship status, combined with a length of commute will have any effects on a Reservist's decision to remain after their initial obligation. The statuses of "annulled", "widowed" or "interlock" were combined with divorced.

d.   Dependents

Similar to the marital status, the number of dependents a service member is responsible for may influence their decisions. This thesis examines if having a certain number of dependents with a length of commute will play a role in their attrition. The variable *depend*=1 will depict if the Marine has at least one dependent.

e.   Civilian education

The level of education a Marine has may play a role in their civilian career and location. The higher the degree the more marketable they are and could increase the likelihood of relocating away from their RTC and making the decision to exit the SMCR. I include three variables in this study to reflect education. *HS_or_lower, Some_College, Bachelor's_degree_or_higher.*

3.   Military Demographics

Marines are assigned a MOS either prior to going or in the last few weeks of recruit training. They are trained to receive a specialized base of knowledge for a job they will perform for the next several years. As previously mentioned in chapter 1, the ASVAB is administered at MEPS to determine what jobs a Marine would be qualified

for. This test will also be used to calculate the Armed Forces Qualification Test (AFQT) score. Other variables under this category include, the total satisfied years served and their rank.

a.   MOS

There are three variables for MOSs. *Combat_MOS* variable consists of infantry, artillery and tanks. *Aviation_MOS* consists of maintenance, support, aircrew, and aviation electronics technicians. *Support_MOS* is everything else such as supply, logistics, communications, administrative functions, and legal. RTC do not have every function of a MAGTF at each location. RTC typically have a site support and one to four battalions of the same function. For example, a Reservist living near Spokane, Washington, will most likely have an artillery related MOS since Artillery Battery P 5/14 is the only unit at that RTC.

b.   Armed Forces Qualification Test (AFQT) score

The variable *AFQT,* is a score from a combination of sections of the ASVAB. Each branch has a different minimum score requirement in order to be qualified. As the score increases so does capacity to excel more complex MOS, such as electronic maintenance, intelligence, and the cyber section of the communications field. The higher the test results, the more complex the Reservist's MOS will be. The more complex and training intensive a MOS is will likely provide the Marine with the knowledge to seek a higher paying civilian job.

c.   Rank

In this thesis rank will not be as big of a factor as in other military studies as most of the Reservists who are approaching the six-year mark will be a corporal or sergeant, assuming they have not had any punitive legal action. This variable will serve as a tool to determine if their rank attained at the time they depart bears any significant weight. The variable *LCpl_or_below* will include anyone who is an E1 (Private) through E3 (Lance Corporal). The variable *Cpl* includes only those Marines whose last rank attained was E4 (Corporal). The variable *Sgt* includes only those Marines whose last rank attained was E5

(Sergeant) and the variable *SNCO* (Staff Noncommissioned Officer) includes those who achieved and E6 or E7.

d. Cohort

The year in which the Marine enlisted could also play a role in attrition rates. Variables for each yearly cohort will include all individuals with a PEBD occurring within that respective calendar year. For example, Marines with a PEBD between January 1, 2000 and December 31, 2000 will fall under the *cohort_2000* variable. Cohort variables will continue for each subsequent year through July 31, 2011.

D. MODELING

This research uses a logistic regression in the analysis to estimate the effects of distance on retention of SMCR first term enlistees. The reference group for comparison is a single, white, male, in a support MOS with a high school diploma from the Pacific region who has earned the rank of Corporal and lives under 25 miles from his RTC. The first model estimates the effect of distance from the Marine's current commute to the RTC. $\beta_1, \beta_2, and \beta_3$ estimates the effects of being 26-50, 51-100 and over 101 miles, respectively, relative to being 25 or less miles away from the RTC.

In model 1, I only include the three distance variables without any other control variables. In model 2, I include demographic variables namely Non-White, Female, Married, Divorced, Dependents, some College, Bachelor's degree or higher, their AFQT score, and which cohort they entered in. In model 3, I include rank and group of MOS. In model 4, I include the geographic region.

E. SUMMARY

This chapter provides a list and the descriptions of the variables used in this thesis. The dependent variable is *attrite* which measures if the Reservist exits the USMC at six years (attrite=1) and does not continue serving past their initial obligation. The independent variables for distances of their current address to the RTC are used to determine if the commute had any effects on attrition. Other independent variables used include age, gender (indicator for female=1), marital status, dependents ethnicity

(indicator for non-white=1), MOS, Lance Corporal or below, Sergeant, SNCO, and AFQT. These factors allow us to have a better understanding of the characteristics of the population used in this thesis.

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IV. RESULTS

A. DESCRIPTIVE STATISTICS

1. Distance

In my sample, 30.29% of individuals live within 25 miles or less of their RTC, 19.3% live between 26 and 50 miles, 22.2% live between 51 and 100 miles and 28.21% live greater than 100 miles from their RTC. 14.57% of our sample population are assigned to RTCs in the Midwest, 13.4% in the Mid Atlantic, 14.34% in the South Atlantic, 13.9% in the Southeast Central. As shown in Table 1, the largest percentage of our sample population is the Pacific and is composed 19%. The West Midwest has 5.35% and New England is slightly lower with 4.81%. The Mountain and Southeast regions have the lowest percentage of Marines with 4.08% and 3.29%, respectfully.

Table 1.　Summary of Distance and Region Variables

variable	mean	sd
dist25	0.3029	0.46
dist50	0.1930	0.39
dist100	0.2220	0.42
dist101	0.2821	0.45
Midwest	0.1457	0.35
West_Midwest	0.0535	0.23
Mid_Atlantic	0.1340	0.34
South_Atlantic	0.1434	0.35
Southeast	0.0329	0.18
SE_Central	0.1391	0.35
Mountain	0.0408	0.20
New_England	0.0481	0.21
Pacific	0.1860	0.39

2.   Personal Demographics

The percentage of females in our population are slightly lower than expected at 4.06%. A majority of the population is white (78.12%). Most of the population is either single (60.19%) or married (35.47%) leaving the remaining 4.32% divorced, widowed, legally separated or their marriage is annulled. 40% of the population has at least one dependent. Unfortunately, the data do not specify if the dependent is a child or spouse. The last area considered in personal demographics is the level of education a Marine has at the time they attrite. 87% of our population has a high school diploma and only 5.8% have earned a Bachelor's degree or higher. Table 2 summarizes all of the demographic variables.

Table 2.   Summary of Demographic Variables

variable	mean	sd
White	0.7813	0.41
Non_white	0.2187	0.41
Female	0.0406	0.20
Male	0.9594	0.20
Single	0.6019	0.49
Married	0.3547	0.48
Divorced	0.0432	0.20
dependents	0.3985	0.49
Some_College	0.0675	0.25
Bachelor's degree or higher	0.0583	0.23

3. Military Demographics

As shown in Table 3, military demographics include the Reservist's last rank held, their AFQT score, and their MOS variable group. Most of the population has at least attained either Corporal (41.41%) or Sergeant (41.99%). The average AFQT score is 65.92 with a standard deviation of 19.71 points. 67.84% of the population only served six years leaving 32.16% serving seven or more years. It was not surprising a majority of the population had a support MOS (61.86%), while the combat MOS and aviation were 31.38% and 6.76%, respectfully.

The percentages of ranks represented per *TOTSATYRS* are predictable with most of them being a Corporal at 6 years and increasing in rank with more satisfied time served. Of the 25,923 serving only six years, 53.84% are Corporals, 34.15% are Sergeants, 11.62% Lance Corporal or below and SNCO is composed of less than .4%.

Table 3.   Summary of Military Demographic Variables

variable	mean	sd
LCpl_or_below	0.0893	0.34
Cpl	0.4141	0.53
Sgt	0.4199	0.53
SNCO	0.0970	0.35
Combat_MOS	0.3138	0.46
Aviation_MOS	0.0676	0.25
support_MOS	0.6186	0.49
AFQT_SCORE	65.9194	19.71

B.   **MULTIVARIATE RESULTS**

1.   **Complete Model**

Table 4 presents the results of the logit regressions in odds ratios for the attrition outcome across the four models. When looking at distance across the first model, the results show all distance is statistically significant however, those Reservists living over 100 miles have lower odds of attrition compared to those who live under 25 miles. The first two models are the only ones that show distance over 100 miles significant and once I add military and regional variables to the models, distance over 100 miles becomes less relevant. Controlling only for distance, the odds of Reservist attriting at the conclusion of their six year contract and lives between 51 and 100 miles are 1.18 times the odds of a Reservist who lives under 25 miles from their RTC. This trend continues across all four models at the 99% confidence interval for the dist_100 variable group.

Models two through four include all demographic control variables including gender, race, family related variables and education level. These three models show non-white Reservists have lower odds of attrition across three models. Interestingly, in model two, Reservists who are married have lower odds of attrition until the addition of controls for rank, MOS and region. Also of note, those in the divorced category have significantly lower odds of attrition across all three models that include demographics. The results for civilian education show having a Bachelor's degree or higher reduces the odds of attrition across models two through four; however, the odds become narrower with the addition of rank, MOS and region controls. Model two shows some college lowers the odds of attrition while models three and four show it increases the odds of attrition. The higher the AFQT score consistently shows throughout all three models to increase the odds of attrition.

Table 4.   Probability of Attrition by Distance, Demographics, Education and Rank

Variables	Distance	Distance, Demographics and Cohort	Distance, Demographics Cohort, Rank & MOS	Distance, Demographics Cohort, Rank, MOS & Region
26-50 miles	1.071**	1.052	1.020	1.026
	(0.035)	(0.035)	(0.040)	(0.040)
51-100 miles	1.179***	1.139***	1.122***	1.136***
	(0.037)	(0.037)	(0.043)	(0.044)
any distance over 101 miles	0.802***	0.822***	0.941*	0.940*
	(0.023)	(0.024)	(0.033)	(0.033)
Non-White		0.837***	0.772***	0.787***
		(0.023)	(0.025)	(0.026)
Female		1.011	1.074	1.085
		(0.057)	(0.074)	(0.075)
Married		0.733***	1.055	1.056
		(0.036)	(0.061)	(0.062)
Divorced		0.343***	0.623***	0.614***
		(0.019)	(0.042)	(0.041)
Dependents		0.655***	0.686***	0.677***
		(0.031)	(0.039)	(0.038)
Some College		0.814***	1.217***	1.215***
		(0.036)	(0.067)	(0.067)
Bachelor's degree or higher		0.391***	0.859***	0.868**
		(0.018)	(0.050)	(0.050)
AFQT		1.003***	1.006***	1.006***
		(0.001)	(0.001)	(0.001)
Cohort 2001		1.185***	1.408***	1.409***
		(0.056)	(0.084)	(0.084)
Cohort 2002		0.965	1.058	1.056
		(0.044)	(0.061)	(0.061)
Cohort 2003		0.880***	0.897*	0.896*
		(0.039)	(0.051)	(0.051)
Cohort 2004		1.828	0.980	0.919
		(2.141)	(1.283)	(1.198)
Cohort 2005		1.407	0.749	0.697
		(1.648)	(0.981)	(0.909)
Cohort 2006		1.761	0.903	0.846
		(2.063)	(1.182)	(1.103)
Cohort 2007		1.899	0.976	0.914
		(2.224)	(1.278)	(1.192)
Cohort 2008		1.772	0.798	0.751
		(2.076)	(1.045)	(0.979)
Cohort 2009		1.903	0.847	0.792
		(2.229)	(1.108)	(1.033)

Variables	Distance	Distance, Demographics and Cohort	Distance, Demographics Cohort, Rank & MOS	Distance, Demographics Cohort, Rank, MOS & Region
Cohort 2010		1.807	0.680	0.638
		(2.117)	(0.890)	(0.832)
Cohort 2011		6.993*	2.526	2.369
		(8.202)	(3.311)	(3.092)
LCpl or below			1.878***	1.885***
			(0.147)	(0.148)
Sgt			0.153***	0.153***
			(0.005)	(0.005)
SNCO			0.004***	0.004***
			(0.000)	(0.000)
Aviation MOS			1.164***	1.194***
			(0.065)	(0.068)
Combat MOS			1.165***	1.153***
			(0.035)	(0.035)
Midwest				1.212***
				(0.054)
West Midwest				1.275***
				(0.083)
Mid Atlantic				0.978
				(0.044)
South Atlantic				1.011
				(0.045)
Southeast				1.094
				(0.088)
SE Central				1.139***
				(0.052)
Mountain				1.311***
				(0.094)
New England				1.107
				(0.075)

Robust seeform in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The first addition of cohorts to the model was the only one with statistically significant results. Both the 2002 and 2003 cohorts are associated with a lower likelihood of attrition than the 2000 cohort. The additions of variables in the last two models make these variables statistically insignificant.

Not achieving the rank of Corporal before reaching the end of their initial obligation period increases the odds of attrition by 1.88 in models three and four. Achieving the rank of Sergeant or SNCO before reaching the end of their initial obligation significantly lowers the odds of attrition. When comparing the MOS variables, both the aviation and combat arms MOSs have higher odds of attrition than does a Marine from a support MOS.

When observing the results of the regions in the fourth model, only 4 of the 8 are significant. Compared to the Pacific region, those that live in the Midwest, West Midwest, SE Central and Mountain regions have higher odds of attrition.

I also ran a regression to test for heterogeneity by rank using the distance variables and found the results not to be statistically significant. I also conducted the same test for region using the distance and found the results not to be statistically significant.

C.   SUMMARY

This chapter summarizes the summary statistics and analysis for the population in this study. The distribution of distances among Reservists vary slightly with two common distances being under 25 or over 100 miles. The majority of our population are single, white, males with no dependents and are approximately 26, on average, when they exit the SMCR.

This research was analyzed using the four sets of models. The first set of logit models examined the odds of attrition by controlling for only for distance. The results surprisingly showed us that those individuals who live over 100 miles from their RTC are at less of an odds to attrite than those who live under 25 miles. The commuting distance group with the highest odds of attrition was the 51 to 100 mile group. I then added in controls for demographics, rank, MOS, cohort and regions and found the variable with the highest odds of attrition is the Lance Corporal or below.

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V.   CONCLUSION

The purpose of this thesis is to determine if commuting distance to a RTC is a determinant for attrition. The analysis focuses on four distance variables: a commute of 25 miles or less, 26-50 miles, 51–100 miles and anything over 100 miles. The sample population includes enlisted non-prior service SMCR whose PEBD is between January 1, 2000 and July 31, 2011 and has at least six total satisfied years of service. The results of this study suggests a commuting distance of over 100 miles actually lowers the odds of attrition. The commute with the highest odds of attrition is between 51 and 100 miles. The Mountain region has the highest odds of attrition, when compared to the Pacific region.

I conclude the thesis by revisiting my original research questions. Is there is a relationship between distance from a Marine's assigned Reserve Training Center (RTC) to their home of record (HOR) address and continuation rates within the USMC Reserves? This research suggests there is a relationship between 51 and 100 miles from the RTC and the Reservist's current address and continuation rates. The highest odds of attrition fall within that distance variable consistently in all of the models. To address the second research question: is there a common distribution of commute distance among first term enlisted Marine Reservists and if it varies by observable characteristics? No, the distribution varies across the four distance variables. In fact, a higher percentage of the sample population lives under 25 miles or over 100 miles. This distribution does, however significantly vary by observable characteristic. The Reservists who have only earned the rank of Lance Corporal and live between 51 and 100 miles from the RTC are more likely to attrite than a Corporal at that same distance variable.

My study only uses statistical data from Marines who successfully serve six or more years to determine if a Marine's commute correlates with attrition. My research does not highlight personal reasons why a Marine chooses not to continue serving in the SMCR. The only way to determine if a Marine left because of their commute is to ask them. I recommend further research into this topic by administering a survey to Reservists who successfully serve six or more satisfied years. This survey should ask the

Marine how far they live from their RTC and if that distance was a burden to them. It may be beneficial to gather feedback on if the Marine feels the compensation for their time and travel is adequate. This feedback could help shape what compensation will have the most impact on retention.

Over 50% of the population in my study lives greater than 50 miles away from their assigned RTC. We all know time is valuable, and given budgetary constraints this is easier said than done, however increasing monetary compensation could assist in retention. Currently, the SMCR provides meals and lodging for Reservists who travel more than 50 miles, and an additional IAT travel reimbursement to SNCOs, Officers and Marines assigned to hard to fill BICs. My research shows Reservists who live beyond 100 miles are at lower odds to attrite than Reservists who live from 51 to 100 miles. My research also confirms higher attrition odds for those living in the Midwest, West Midwest and Mountain regions. Adding the reimbursement of mileage to the current policy might be beneficial; however, it is not feasible due to travel cost reimbursement restriction set forth by the Office of the Secretary of Defense. The current IDT travel reimbursement of $300 acts an incentive to retain the necessary number of Reservists, but perhaps this amount is not enough. For the Reservists assigned to RTCs in those three previously mentioned regions, I would recommend increasing the reimbursement program cap to assist in the compensation for time and travel.

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