

RE UP? YOU'RE CRAZY!
RETENTION VERSUS MOBILITY IN TODAY'S ARMY

by
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April 2009

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“If I have seen farther it is by standing on the shoulders of giants.”

– Sir Isaac Newton

I would like to dedicate this work to my wonderful wife, Megan. Let’s be honest: She did enough of the data recording to have her name somewhere in this paper. Five hundred eighty-one data points entered by hand into an Excel spreadsheet should probably earn a person more than just thanks. Ahuvi...I owe you!

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ABSTRACT

Retention practices in the U.S. Army face an incentive problem. The amount of work that officers undertake to retain a soldier should be based in part on those officers' expectations of accruing benefits. In this paper, I analyze Army National Guard retention rates to see if the possible mobility of a soldier (which affects his leadership's expected benefits) is systematically related to the probability he will be retained. A soldier's mobility translates into competition among military units for that soldier's service. There are two possible and contradictory effects of this competition. The first is the standard microeconomic effect of increasing competition in a monopsonistic environment. This would be expected to increase quantity (in this case, the quantity of soldiers retained). The second, less intuitive effect is that competition among battalions reduces a soldier's ability to effectively commit to long-term service with any battalion. This causes a reduction in quantity. I have found that the second effect dominates. This paper contributes to economic literature by improving the understanding of incentives in large organizations.

CHAPTER 1

OVERVIEW

This paper presents information on and analysis of reenlistment rates in the Army National Guard. The basic hypothesis presented is that retention of soldiers and mobility of soldiers are related. Information in this thesis is based on the Army National Guard.¹

Incentives drive all of us. Clearly, the concept that people respond to incentives is *a*, if not *the*, bedrock principle of economics. Providing the right incentives can encourage people to do things that, left to their own devices, they would not do. Military service is certainly one of these things. To volunteer to enter combat with the potential of having to visit violence upon others or possibly be killed yourself is not easily explained with a simple model of self-interested behavior. Yet, every day, people in the Armed Forces take oaths of enlistment that greatly increase their respective chances of entering that violent arena. Many people who enlist once choose to enlist again. Why do they do this? What affects their choice to do this? How do these incentives work in U.S. Army retention?

Economic theory asserts that individual parties do not produce socially optimal levels of public goods. Because all the benefits do not accrue to an individual, the socially optimal level of a public good is usually not attained in a free market. Military

¹ While many members of the Army National Guard have been consulted on these issues, no analysis herein should be considered to be the opinion or policy of the Army National Guard or any of its subordinate commands.

protection is a public good in that it is non-rival and non-excludable. Governments have long provided public goods and forcibly taxed their citizenry to solve this problem.

The Basic Theory

A soldier who reenlists provides benefits to the Army, the Nation, his battalion and the men with whom he directly serves.² The efficient amount of retention is that level in which the benefits to these various parties are equal to the costs imposed, most notably, on the soldier. If a soldier is able to stay with his unit when he reenlists, his unit would theoretically spend more to retain him.³ While some reenlistment contracts specify the unit in which all of the future service will be rendered, most do not. As such, any given battalion has no guarantee that a soldier will stay. There are many potential barriers to a soldier moving. He may have to go to another duty station, he may be required to deploy to a combat zone or he may have to go to a school to learn a new job for the Army. These barriers may allow a soldier to commit to staying with a battalion and therefore increase the work that the battalion puts into retaining him.

The Counter-Argument

There is an important counter-argument to this line of reasoning. The more that a soldier can move, the less monopsony power is held by each battalion. The monopsony,

² Female soldiers are a critically important part of the Army, as well as the other Services in the Armed Forces. In this paper, the male-gender pronoun will include reference to females except where specifically mentioned.

³ It is true that soldiers are not homogenous and some soldiers would most benefit the Army through their respective absences. However, for this paper, let us assume that the marginal soldier provides benefits to his battalion and that his battalion desires his retention.

in this case, is the power of the battalion to be the only buyer of military services. Of course, military service is the soldier's labor. The increase in competition for a soldier's labor, which is seen by the soldier as increased mobility, would increase retention given standard microeconomic theory.

What Does this Study Accomplish?

Clearly, in the age of terrorism and jihad, the United States Army's ability to recruit and retain soldiers presents a challenge that must be met successfully. Our ability to resist our enemies on the battlefield will be a key part of the ongoing "War on Terror."

In this study, I examine one of these potential barriers to movement. Where there are not good prospects for transferring (i.e., probability of movement = 0), there is a guarantee that the soldier will stay with a battalion.⁴ This should increase the amount of effort that the soldier's leadership will expend in retaining him. This is true because the expected benefits of retention accrue to that leadership. Alternately, a non-existent or unenforceable barrier that increases the probability of movement⁵ would diminish the expected returns to a battalion and hence decrease that battalion's retention efforts.

While the Army mandates retention efforts, the enforcement of any particular mandate is not costless or perfect. As such, while a battalion may not take into account the benefits of retention to the Army or the Nation, they certainly take their own benefits into account.

⁴ For more information on the rules regarding transferring, please see AR 600-8-11.

⁵ This would be any situation such that $P > 0$, not necessarily $P = 1$.

CHAPTER 2

A BRIEF INTRODUCTION TO THE ARMY⁶

The Army National Guard is currently comprised of 581 battalions, State Troop Commands and battalion-level detachments. These battalions can be modeled as individual, self-interested actors with going concern.⁷ These battalions, under the guidance of their respective commanders and staffs, seek to maximize their own utility. While somewhat cynical, it is only expected that these battalions pursue the good of the Nation, their respective State and the Constitution of the United States to the extent that their incentives are aligned properly.

One of the primary incentives in the military is that when the battalion is in a combat zone, the members of that battalion can be killed or injured. To prevent this, battalions invest in various inputs modeled as various types of capital and labor. While battalions usually have quite limited choices regarding the acquisition and use of these inputs, at the margin, they compete with each other for them.

To secure labor, the Army must invest significant resources in the training and discipline of new soldiers, resulting in specific human capital.⁸ This investment is sunk upon its completion. While contracts are used to keep a soldier in the military for a

⁶ For a more detailed analysis, please see Appendix B.

⁷ All data points in this study are assumed to be at the battalion level unless otherwise specified. References to “battalions” will include State Troop Commands, battalion-level detachments and all other detachments listed on the DSRO unless otherwise specified.

⁸ For an excellent, in-depth treatment of specific human capital, please see the Milgrom & Roberts 1992, chapter 11.

period of time, the sunk cost of his training certainly pays benefits beyond the length of his contract.⁹ Also, upon promotion, more training (and hence, more sunk costs invested) is required, renewing the cycle.

Soldiers' labor in the Army is not homogenous. Different soldiers have different levels of training and experience. One of the ways to ensure a steady flow of labor is to retain soldiers currently enlisted in the battalion. Retention is very important to the Army. Recruits are usually forthcoming, but they must be drilled and disciplined into the Army's unique system. A veteran soldier does not have this requirement. So both in terms of the pecuniary cost of initial training and in terms of time, it is valuable for a unit to retain soldiers.

Applicability

This analysis draws information from one data set. This data set is the Director's Readiness Strength Overview (DRSO). This report gives quarterly information on the end strength of the Army National Guard. It reports on the strength of every State's Army National Guard down to the company or detachment level. Because of the source from which these data are drawn, any conclusions or statistical analysis can only be considered applicable to the Army National Guard.

While the data are strictly applicable only to the Army National Guard, it is reasonable that other components, such as the Active Component and the Army Reserve,

⁹ "...long-term employment *encourages* the development of productive, firm-specific human capital: long-term employment and investment in firm-specific human capital are complements." This is from Milgrom and Roberts, pg 363. Emphasis is original. Here, we see the importance of retention as it is retention that makes a soldier's service "long-term."

would show similar tendencies. Also, the other services, the Navy (including the Marine Corps) and the Air Force could be expected to behave in a similar fashion.

The broader presumed applicability of this study is expected because, at base, the services are very similar. They are composed of, first, commissioned officers, who direct leadership, collective training and strategy. Second, the services have non-commissioned officers, who direct training at the individual and small-group level and who are responsible for implementing the intent of the officers. Finally, the enlisted people are those who execute the orders assigned them. While there are minor differences, the major similarities in structure would seem to indicate broadly similar tendencies. While there are very relevant differences, the comparison certainly has some validity.

Finally, this study should have applicability beyond the military service. Most companies, public or private, must first invest substantial sunk costs into their workers in order for these workers to be productive in the long run. The investment in the workers' human capital is usually offset by contracts which, when perfectly enforced, solve any problems associated with the workers' commitment to pay dividends on that investment. However, realistically, contracts are rarely perfectly enforceable; so many parties face some level of question on the commitment of those in whom they are investing sunk costs.

CHAPTER 3

THEORY

Many things influence retention. Some of those things are, theoretically, the amount of work, time and effort spent by the leadership of a battalion to retain soldiers. While officers and non-commissioned officers are everywhere ordered to care about retention, the incentives that such leaders have varies from one battalion to the next.

It is a common proof that private parties unable to internalize the social benefits of public goods produce too few of these goods. Soldiers with high mobility are similar to public goods as they have benefit to various parties but no specific battalion is able to capture these benefits. As the battalion gets a greater expectation of keeping the soldier in question, the battalion is more able to internalize the benefits of that soldier. As such, battalions that are able to internalize these benefits should work harder at the margin to retain soldiers. Basically, as the battalion is able to internalize the benefits of retention, the public-good problem is nullified. Soldiers with high mobility prevent this; soldiers with low mobility allow for greater internalization of the benefits to battalions.

When considering the incentives created when battalions compete for soldiers, there are two distinct effects that warrant consideration. The first is the standard microeconomic model of competition and the effects of reduced competition in the case of buyers (battalions are buyers of soldiers' services). The second effect moves in the opposite direction. In this effect, the competing battalions increase the soldier's mobility and decrease his ability to effectively commit to long-term service with any battalion.

This decreases the battalion's ability to internalize the benefits of the future service of soldiers and therefore decreases retention.

The Classical Monopsony Effect

Battalions that compete with each other for soldiers have significantly reduced monopsony power in the market for soldiers. These battalions must each work harder to create good working conditions when they try to get the next soldier to serve. This effect would be expected to increase retention of soldiers in the presence of numerous battalions and decrease retention when only one battalion (or one type of battalion) is present. As seen in Figure 1, a monopsony buyer is able to set marginal expenditure equal to its marginal benefit (MB), reducing both the price of each unit purchased (not shown) and reducing the quantity purchased from the efficient quantity ($q_{\text{Efficient}}$) to the monopsony quantity (q_{Actual}). In this case, one would expect the standard microeconomic effect of reduced competition between battalions to be a reduction in retention.

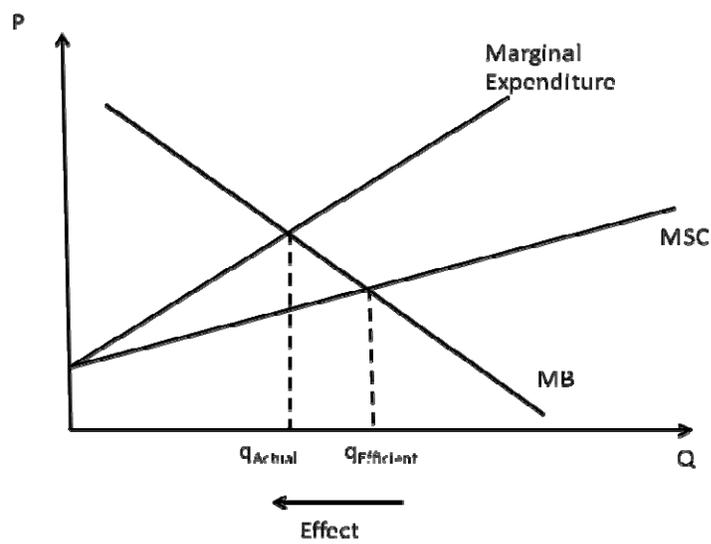


Figure 1. Monopsony.

The Commitment Effect

The alternative is less obvious but is the thesis of this paper. That is that competition inherently involves mobility on behalf of soldiers. This mobility reduces a soldier's ability to commit to staying with his battalion after he reenlists (Figure 2). This inability to commit reduces the expected benefit of retention to his leadership. Not only is a soldier unable to commit, but his battalion is unable to capture the benefits of his reenlistment. As such, leadership will not work as hard to retain a soldier who is mobile and competition therefore reduces retention at the margin. It is unclear why a rational battalion leadership pursuing its own interest would work hard to retain a soldier who was not expected to stay in that battalion and provide benefits. Again, we see the inability of the battalion to internalize the benefits of the reenlistment of soldiers as key to the inefficiently low retention of these soldiers.

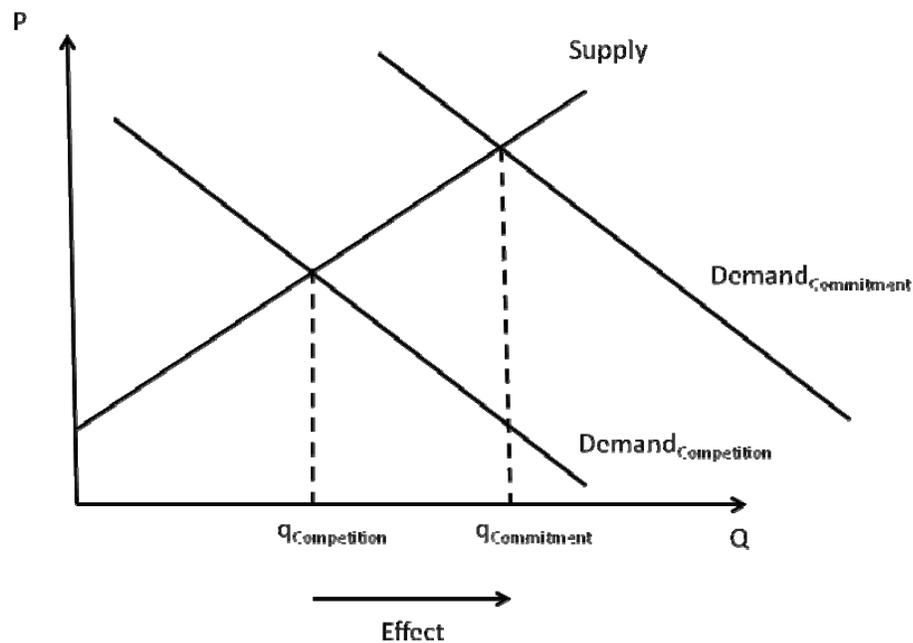


Figure 2. Competition vs. Ability to Commit.

Synopsis

The problem is inherently one of private goods versus public goods. In both cases, the Army benefits from the retention of the soldier. However, in the case where both the retaining individual and the retained soldiers are mobile, the expectation of benefits at a personal level is so diffuse as to be irrelevant. In the case where both parties have limited mobility, the expectation of benefits is high enough that an officer or NCO could reasonably expect to benefit from the retained individual.

How much does this private-vs.-public-good issue affect the Army's retention rates?¹⁰ If the effect is large and significant, this shows that the Army may be able to correct inefficient recruiting and retention policies. It is relevant to note that the lack of a statistically significant effect may show that the Army has set in place policies that effectively address the problem.

The Empirical Test

It is, for obvious reasons, not feasible to simply ask officers and senior NCOs how much time and effort they spend on retention. If their respective bosses were standing nearby, the answers would probably be biased upwards. While this is not feasible, it is possible to know some information on the potential mobility of soldiers. This is done by looking at the State in which the soldier serves and determining the availability of other similar jobs in the same State and neighboring States. This is the proxy for mobility.

Retention numbers are drawn from the DRSO. The stochastic relationship between these

¹⁰ In this case, the good is the benefits stemming from the soldier's reenlistment. If the soldier's probability of transfer is $P = 0$, then other units are effectively excluded from the benefit. As the probability of transfer increases, this exclusion is reduced, moving the good toward status as a public good.

two sets of variables should confirm or deny the suggested relationship that is the thesis of this paper.

The basic problem can be viewed as one involving uncertainty. The marginal soldier wants to reenlist and his leadership wants him to do so.¹¹ His leadership is willing to invest work and rewards in achieving his reenlistment. The marginal soldier is willing to take these and reenlist. The expected payoff of a soldier decreases as his mobility increases. The basic empirical result that should be observed is that retention is negatively correlated with mobility. An empirical study can be conducted based on this thesis. The expectation is that retention is negatively correlated with mobility. Retention is easily determined. Retention rates are routinely calculated for all battalions in the National Guard. Mobility, however, is not something that can be readily observed or measured. While the number of people who leave one battalion for another battalion could be observed, what is needed is not a number of people or even a per-capita rate, but simply the ability to move.¹² Clearly, what is needed is a proxy (or proxies) for mobility.

¹¹ Marginal, in this case, does not refer to the soldier's performance. It refers to the soldier who, at the margin, is willing to reenlist.

¹² Indeed, the number of soldiers who leave one battalion for another is known to that battalion. However, this number gets put into an overall loss category and is not available in any nation-wide data set.

CHAPTER 4

VARIABLES

The thesis of this paper is basically that competition is bad.¹³ While that has a very heterodox ring, the explanation that mobility caused by competition dilutes the potential benefits to one party begins to fall in line with classical microeconomic theory. When we see the good as a public good in cases of mobility and a private good in cases of limited mobility, we have an interesting (if counter-intuitive) story in which competition is bad. More specifically, we see that mobility reduces the chances that the marginal, efficient reenlistment will occur because the soldier cannot effectively commit to paying dividends to his leadership.

To understand the proxies for mobility, it is important to remember that soldiers are not homogenous in fact, nor does the Army consider them to be so. For a soldier to move to a slot with a different MOS, he must go to a school and be reclassified. This presents a non-trivial cost to the soldier when considering moving. If, however, the soldier is moving to a different slot with the same MOS, he does not face this cost. Also, if he is moving to a different battalion with the same organization, he faces no costs in adapting to a different structure and all his human capital is applicable.¹⁴ As such,

¹³ More correctly, mobility is bad. The mobility of soldiers effectively makes various battalions compete for labor. This probability $p < 1$ that a soldier's labor will be invested in the battalion after a soldier reenlists causes the leadership to devote fewer resources to ensuring a soldier's reenlistment.

¹⁴ Some human capital is general, some is MOS-specific and some is unit-specific. General human capital includes things like doing basic Army paperwork properly. While this skill is important, it is found among most experienced soldiers, regardless of MOS. An example of MOS-specific capital would be a firm knowledge and experience in small-unit tactics for an infantryman. It is unclear why soldiers with other MOS ratings would have this experience. Finally, an example of unit-specific human capital would be a

instead of measuring mobility, which is not feasible, I use the availability of similar units or units requiring the same MOS to serve as proxies.

This explanation of variables will include three types of variables. First, the explanatory variables will act as proxies for mobility. Second, the dependent variables will be values from the DSRO showing different measures of retention. The controls will correct for sources of variation possibly correlated with the explanatory variables.

Some of the variables in this study are clearly identified and understood. *State* and *Unit* are clearly understood as being the State in which the National Guard battalion serves and the name of the battalion, respectively. These variables are explanatory variables to track the State and the unit nomenclature of each observation. These variables are only for the purpose of tracking each battalion.

Main Explanatory Variables

The main explanatory variables are all binary. Values of “1” indicate true, which is to say that a unit exists to satisfy the criteria for which the variable is named. Values of “0” indicate that there is not a unit to satisfy the criteria.

Master Gunner rating. A soldier in a CAB would have this training, while a soldier in a light battalion would not, nor would he need it. This makes an impact on mobility because there is less of a reason for a light battalion to “poach” a soldier from a CAB than for another CAB to do so. However, the soldier’s MOS makes training and integration into the unit easier, despite the difference in unit type.

Basic Explanatory Variables

In State Unit measures whether a similar battalion exists in the State for which the observation is recorded. Similar, in this case, means that the battalions share the same official MTO&E. It is relevant to note that these units must not only be the same nomenclature of unit, but they must also have the same MTO&E. This means that while two battalions may both be called “Infantry” battalions, they must both be light infantry in order to give a “1” value for *In State Unit*. If they were a light battalion and a CAB, the value for *In State Unit* would be 0.

In State MOS measures the ability of the soldiers holding the primary MOS of a unit to move to other battalions within the State. Again, a soldier can move to a different MOS, but this requires reclassification, a process which, depending on the MOS, can be quite lengthy.

Two examples of the *In State* variables should suffice. First, take the example of Montana’s Combined Arms Battalion (CAB), 1st-163rd INF. This battalion has infantrymen and tankers as its two primary MOS classifications. The other battalions in the State of Montana include a Combat Service Battalion, a Combat Service and Support Battalion and an Aviation Battalion. These battalions, respectively, have transportation, military police and aviation support MOS classes as their primary requirements. None of these battalions is a similar battalion, so all of them have *In State Unit* values of zero. A soldier holding one of the primary MOS classes in 1st-163rd INF would have to reclassify

to move to one of these battalions.¹⁵ As such, the value of *In State MOS* for the 1st-163rd observation is “0.”

Both *In State Unit* and *In State MOS* could be one if the same type of unit exists in a State. An example is Tennessee. The 287th Armored Cavalry Regiment (ARC) is based in Tennessee. There are two Combined Arms Battalions in the State. Because the MOS and the unit are the same, both *ISUnit* and *ISMOS* would be “1”.

Another example of *In State* variables is found nearby in South Dakota. South Dakota, like Montana, has four battalions. However, South Dakota has two engineering battalions and two field artillery battalions. Since there are two of each type of battalion in the State, the values of *In State Unit* for every battalion are “1”. Because any soldier in South Dakota’s battalions can move to another battalion without changing his MOS, each observation for South Dakota has a value of “1” for *In State MOS*. This shows that soldiers in South Dakota have more intra-State mobility than soldiers in Montana.

There are also *Adjacent State* variables. *Adjacent State Unit* and *Adjacent State MOS* measure inter-State mobility using the same standard as the *In State* variables.

An example is in order. Alabama has a Combined Arms Battalion that is primarily made up of infantrymen and tankers. Mississippi has an Armored Battalion, which has tankers as its primary MOS. Because the units are different, with one unit having a different MTO&E than the other, the value for the Mississippi battalion’s *Adjacent State Unit* variable is “0”. Even though the battalions have differing

¹⁵ This just refers to the soldiers having the primary MOS of the battalion. There are some soldiers in any battalion who have MOS classifications that allow them to move to any battalion. An example would be a soldier in Military Intelligence. All battalions have “intel” sections, and this soldier could move wherever he wants to, given an opening. However, these soldiers are small in number compared to the soldiers having the primary MOS of the battalion, so they are not considered in this study.

compositions, tankers from Alabama and Mississippi could move back and forth without having to reclassify. Because of this, the values of *Adjacent State MOS* for both units would be “1.”

Notice that the Alabama battalion was left out of the *Adjacent State Unit* discussion. The Alabama battalion, 1st-167 INF (CAB) has a CAB neighbor in Georgia. As such, the value of *Adjacent State Unit* for the 1st-167 INF is “1”. This shows that soldiers in the Alabama battalion have greater inter-State mobility than do soldiers in the Mississippi battalion. They have the option of the same type of unit in another State (*Adjacent State Unit* = 1) and they have a similar MOS in another State (*Adjacent State MOS* = 1).

For both the In State and *Adjacent State Variables*, the difference between the Unit and MOS values are important. A true value for Unit means a similar battalion exists. This shows that when seeking a transfer, any soldier should be able to move without bearing the costs of reclassification. When Unit is true, MOS is trivially true as well. This fact causes the problem of multicollinearity with *ISunit* and *ISMOS*.

Ordered Explanatory Variables

To solve the problem the problem of multicollinearity, additional variables were created. These variables include *ISMOSnu*, *ASUnitnoIS*, and *ASMOSonly*. These variables, along with *ISUnit*, are referred to as the “ordered proxies.” They are exclusive and they give an ordered approach to mobility. The most mobility a soldier would

experience is if *ISUnit* is true. The next level would be *ISMOSnu*.¹⁶ Another level down is *ASUnitnoIS*. Finally, there is *ASMOSonly*, as the lowest level of mobility.¹⁷

In-State MOS (not unit) is true when an MOS exists in a State, but not a similar unit. Abbreviated *ISMOSnu*, it is designed to show that no similar unit exists in the State, but that the majority MOS in the unit in question does exist. This variable can be used with *ISUnit* and not have any observations true on both variables. This eliminates the double counting in *ISMOS*. *ASMOSnu* does the same thing with Adjacent States. Again, *ASMOSnu* and *ASUnit* will not both be true at the same time. *ASMOSnoIS* tells us that an adjacent State has an MOS but that MOS is not found in the State. *ASunitnoIS* tells us that an adjacent State has a similar unit and that there is not a similar unit in the State.

Sometimes, an MOS exists either in or adjacent to a State, but the same type of battalion is absent. For example, Indiana has a Combined Arms Battalion and two mechanized infantry battalions. The infantrymen in the CAB are free to move, however, the battalions to which they may move have different structures, so movement may be impeded. It is also relevant to note that the tankers in the CAB cannot move without reclassifying. This shows how the MOS variable is “looser” than the Unit variable.

The various main explanatory variables, when viewed together, give a good picture of a soldier’s ability to move to another battalion. Note that a soldier’s ability to move is inversely proportional to his ability to commit to staying with his current

¹⁶ This assumes that an Inter-State Transfer (IST) is harder to get than moving to another battalion in the same State. This may not always be true however, in most cases, the move to another State would put higher costs on the soldier.

¹⁷ Of course, if none of these variables are true, this state of no inter- or intra-State mobility would be the lowest possible level.

battalion. This information is readily observable by his leadership and the question is whether they make their decisions to invest in that soldier on that criteria.

Dependent Variables

The dependent variables in this study show the outcome of the work that the leadership of a battalion does to retain a soldier. This is easily determined by the retention numbers in the DSRO. With some stochastic variance, the retention of soldiers in a battalion is a function of the work invested in retention by that battalion's leadership. All of the dependent variables are continuous in theory. In practice, the DSRO shows these values to one place beyond the decimal.

The dependent variables for this study are various different measures of reenlistment and loss. Reenlistment is basically synonymous with retention. If a soldier reenlists, he is considered "retained."¹⁸ Loss is the opposite of retention. Note that loss can occur for just about any reason. A soldier could choose not to reenlist, he could retire, he could go Absent Without Leave (AWOL), he could die or he could transfer to a different battalion. All of these reasons for loss are included in the loss rate variables.

It is valuable to ask upon what do the dependent variables depend? At the margin, a soldier chooses to reenlist (or, alternately, chooses not to be a loss) based on the work that his leadership puts into him. That work invested is a function of the leadership's expected benefit. The leadership's expected benefit is in turn based on the

¹⁸ Note that a soldier who reenlists and then transfers to another battalion would be counted on both the reenlistment value and the loss value. While this satisfies the Army's definition of retention, the soldier is no longer putting his human capital into the battalion that worked to retain him. This is the effect of that battalion's inability to contract to keep the soldier.

soldier's mobility. The soldier's mobility is proxied by the existence of a similar unit or MOS in the same State or a neighboring State. We now see the relationship between the sets of variables in this study.

Loss Rates

First Term Losses is a continuous variable that measures the percentage of enlisted people in a battalion who fail to complete their first term of service. *First Term Losses* picks up a greater number of young soldiers as these are the soldiers who are in their first term. It should be noted that just because a soldier is in his first term does not mean that he has not amassed significant human capital. Even soldiers in their first terms are well worth retention effort.

Careerist Losses is a continuous variable measuring the careerist losses in each battalion. A careerist loss is defined as the loss of someone in his second or later term of service. Any soldier included in this category has by definition already served his first term and reenlisted. As such, it is reasonable to infer that fewer of these losses are due to disciplinary problems and may reflect a more accurate picture of how a seasoned soldier views his battalion.

Loss Rate measures all the losses from a battalion. Both Officer and Enlisted losses are accounted for in this variable. *Loss Rate* is not offset by gains to the battalion; it simply measures losses. An example is the case of an enlisted man who takes a commission and becomes an officer. He is counted as a loss because he must first receive an administrative good-conduct discharge. The fact that he may go back into that

same battalion as an officer does not reduce the *Loss Rate* value for that battalion's observation. A high loss rate is probably highly correlated with low retention efforts by that battalion.

Enlisted Loss Rate measures the loss of enlisted people across a battalion. It measures enlisted losses across all grades of enlisted men. It is reasonable to assume that the amount of work that the battalion invests in retaining soldiers is strongly (negatively) correlated with *Enlisted Loss Rate*. *Ceteris paribus*, the more time and effort that officers and senior NCOs put into retaining soldiers, the lower *Enlisted Loss Rate* should be.

Officer Loss Rate measures the loss of warrant and commissioned personnel from a battalion. For the most part, this study is concerned with the retention of enlisted men. As such, *Officer Loss Rate* will play only a small role. While a significant positive correlation between *Officer Loss Rate* and the other loss rates would indicate support for this thesis (because officers who are leaving the battalion have less reason to work on retention), there are other variables that could drive both *Officer Loss Rate* and the other loss rates and any correlation is weak support at best.

These various loss rates are used to show the amount of work that the leadership of a certain battalion puts toward retention. That work should be considered to be the efficient amount, according to the battalion in question. Again, a soldier who can effectively commit to staying with a battalion will probably be "worked on" by his battalion more than one who cannot. Given current Army regulations on transfers, no soldier can really commit to staying in one National Guard battalion.¹⁹ However, soldiers

¹⁹ Some Active Component enlistments are specific to a regiment or some other unit. Guard enlistments are not like this. A Guardsman is for the most part free to move to another State upon request. He is also

who cannot easily move to another unit have a set of circumstances that allow them to make a *de facto* commitment more effectively.

Reenlistment Rates

Reenlistment Rate measures the percentage of eligible people who choose to reenlist. The Army's arbitrary standard for reenlistment is two out of three eligible soldiers. This means that if a battalion has three soldiers eligible to reenlist and two of them choose to do so, that battalion will have a 100 percent reenlistment rate. Basically, *Reenlistment Rate* measures the percentage of the reenlistment of two thirds or those who are eligible. However, to then posit that *Reenlistment Rate* cannot exceed 150 percent would be incorrect. The Army considers a soldier to be eligible for reenlistment at 180 days before the end of his current contract. However, depending on a soldier's current contract and the contract into which he plans to enter, he may be legally able to reenlist up to two years before his current contract expires. Again, in a battalion with three people eligible for reenlistment according to the Army, it is possible that six people will sign new enlistment contract during the rated period. This would yield a seemingly non-sequitur *Reenlistment Rate* value of 300 percent for that battalion's observation. The choice to reenlist is based on many things and those things vary from one soldier to the next. However, the effort his superiors have invested in him is certainly a factor.

able to transfer to another unit upon obtaining the consent of the State Personnel Command, which is usually forthcoming. Under some circumstances, such as remaining time required from a school, the Guardsman would have to complete that time before he could move.

Obligor Reenlistment and *Careerist Reenlistment* are divisions of *Reenlistment Rate*. An obligor reenlistment is a reenlistment from a soldier having nine or fewer years of service. *Careerist Reenlistment* measures soldiers who have more than nine years of service. Both of the variables measure on the same two-thirds rate that *Reenlistment Rate* measures.

The various reenlistment rates are, like the loss rates, pictures of how hard a battalion works to retain soldiers. Higher reenlistment rates, *ceteris paribus*, show more work on the part of that battalion. In the cases of the various loss rates, the lower the losses, the more work done. In the case of reenlistment rates, higher numbers indicate more work.

Controls

Omitted Variable Bias (OVB) exists when an independent variable has been omitted erroneously from the regression. If that variable affects the dependent variable (its regression coefficient is not zero) and the variable omitted is correlated with another independent variable used, OVB will exist and cause problems in the regressions. In an attempt to eliminate this problem, a number of controls have been added.

The controls in this project include political and income controls. The political control compensates for the political feeling in a State. Because the military is the action arm of the government, a State in which the citizens disagree with the federal government's actions should see a lower rate of military service, at the margin. The income control deals with per-capita income in a State. The higher the per-capita income in a State, the higher the opportunity costs of being in the military.

The main explanatory variables in this study are binary variables that measure the existence of similar units or MOS values near any given battalion. Those variables are true or false depending on the location of National Guard battalions, which is determined in part by the National Guard Bureau and in part via the political process. The idea in including a political proxy is that States with a certain political leaning (conservative, for instance) may have Senators and Representatives who work hard for a greater share of the military expenditure pie. Also, per-capita income may have an effect on the tax base, which may in turn impact on the number and type of units in a State. These have been included to reduce the possibility of OVB.

Red State Percentage (RSPerc) is the percentage of the vote obtained by President Bush in the 2004 election. Due to third-party candidates, a value of less than fifty percent could still qualify a State for sending its electoral votes to President Bush.

Red State is a binary variable that measures a State's electoral vote in the 2004 election. A "1" value of *Red State* indicates that the State's electoral votes in the 2004 Presidential Election went to President Bush. A "0" value indicates a "Blue State", or one that voted for Senator John Kerry.

Income Per Capita is a measure, by State, of the per-capita income²⁰. It is abbreviated *IncPC*.

²⁰ These statistics are courtesy of www.bls.gov.

Estimating Equation

Now that the variables have been described, an estimating equation can be constructed. The estimating equation will take the form:

$$[Y_i] = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_{RSPerc} RSPerc_i + \beta_{IncPC} IncPC_i + e_i$$

for $i = 1, 2, \dots, 570$

The various dependent values are contained in the $[Y_i]$ term. X_{1i} through X_{4i} represent the ordered mobility proxies and β_1 through β_4 are the constants²¹ for the ordered proxies.

Most interesting will be the values for the various constants β_1 through β_4 .²² These values will show which effect (commitment vs. monopsony) dominates.

²¹ Specifically, a vector describing the constants of the various dependent variables to that ordered proxy.

²² Note that a constant that increases reenlistment rates would tend to decrease loss rates. The effects of the ordered proxies will have opposite signs on reenlistment rates and loss rates assuming a uniform effect.

CHAPTER 5

RESULTS

The Results section of this paper will begin with a very brief review of theory, including the contradictory effects expected from classical competition and inability to commit. I will then address the effects of the independent variables upon the various loss rates and reenlistment values, respectively. There will be a brief commentary on special cases.

There are two possibilities concerning the mobility of soldiers. One is that mobility reduces the monopsony power of battalions and increases retention. The other is that mobility diminishes a soldier's ability to commit in the long run and reduces retention. If the monopsony effect dominates, loss rates should be negatively correlated with mobility. The reverse is true if the commitment effect dominates. With reenlistment rates, the monopsony effect should yield a positive correlation with mobility. Again, there should be a negative correlation between reenlistment rates and mobility if the commitment effect dominates. As seen from the comparison of means given the value of *ISUnit* (see Appendix A, Table 2), the mobility effect seems to dominate as all reenlistment values are higher (two are statistically significant) and all loss values are lower given the lower value of the mobility proxy.

Regarding the controls, per-capita income should be negatively correlated with retention as higher income per-capita shows higher opportunity costs of military service. The effect of the political proxy is unclear *a priori*.

Loss Rates

When the various loss rates are regressed against the independent variables, there is some support for the commitment effect. As seen from Appendix A, Table 8, *IS Unit* has the strongest effect, with significant impact (at the 90% level) on *Careerist Losses*, *Loss Rate* and *Enlisted Loss Rate*. Note that this is the significant value for β_1 as shown in the estimating equation.²³ While none of the other impacts of the ordered mobility proxies are significant, it is relevant to note that all three significant values, seven of eight values with $t > 1$ and twelve of twenty values in the regression are indicative of the commitment effect. When mobility increases, so do loss rates.

From where do these effects come? They do not come from income or political leaning, which are controlled. As seen from Appendix A, Table 8, the controls do not have a statistically significant effect on any of the loss rates. Neither per-capita income nor the political proxy has a relevant impact. What is the causal mechanism? It seems clear that increased mobility decreases a soldier's ability to commit. This then translates into increased loss rates.

Reenlistment Rates

Regressing the ordered mobility proxies against the various reenlistment rates reveals strong evidence in favor of the commitment effect. When the same type of unit exists in the State (i.e. *IS Unit* = 1), *Reenlistment Rate* falls almost 40%, with *Obligor*

²³ As previously mentioned, a positive correlation between mobility and loss rates indicates the dominance of the commitment effect.

Reenlistment and *Careerist Reenlistment* each falling by an average of 25%.

Reenlistment Rate is affected by all of the mobility proxies in a significant manner and *AS Unit nois* affects *Careerist Reenlistment*. Every mobility proxy has a negative impact on every reenlistment rate. Of the twelve estimated coefficients, each one is in the direction of the commitment effect (as opposed to the monopsony effect) and seven are statistically significant at the 90% level. These are the values with respect to reenlistment for β_1 through β_4 as seen in the estimating equation. The negative correlation between mobility and reenlistment is strong evidence that mobility reduces reenlistment rates.

It is valuable to note that the various reenlistment rates should show the strongest correlation with the ordered proxies. Remember that the various loss rates show losses for any reason. There are retirements, medical discharges and various other sources of loss that have little to do with a soldier's mobility, his ability to commit to his battalion or his battalion's ability to internalize the value of his retention. However, this "noise" is not present in reenlistment rates and any change in the incentives of the parties involved in the reenlistment process (the soldier and the battalion) should show clearly. As seen from the results, they do.

Special Comments

The special comments section will remark on two interesting results. The first is the values found from *Officer Loss Rate*. The second is the lack of significant results from the controls.

The thesis of this paper is that officers provide a driving force in the retention of soldiers. They do this based on their expectations of accrued benefits from the soldiers whom they retain and their expectations of benefits are based on mobility. That mobility has a statistically significant impact has already been documented. However, *Officer Loss Rate* provides another angle from which to test the hypothesis.

An officer who is soon to leave a battalion would not expect benefits from a soldier who reenlists in that battalion. This would lead us to expect lower retention given higher values for *Officer Loss Rate*. Instead of having to measure mobility, we allow some other factor x to cause officers to leave, increasing *Officer Loss Rate (OLR)*. Since the officers know they are leaving the battalion, they do not work as hard on enlisted retention (or enlisted losses, referred to as *EL*). Graphically, this is shown:

$$X \rightarrow OLR \rightarrow EL$$

An alternate explanation is exemplified by a story that officers leave because their enlisted people are leaving. I know from personal experience that leadership is not as rewarding when there is nobody to lead. This theory would lead us to conclude that using *OLR* as an independent variable introduces reverse causation and is graphically depicted thus:

$$X \rightarrow EL \rightarrow OLR$$

Finally, it is possible that whatever factor or factors that influence *EL* does not work through the mechanism presented in the hypothesis. Let x be a negative or positive command climate that influences the retention of both officers (acting on *OLR*) and enlisted (acting on the various *EL* values). This is depicted graphically as:

$X \rightarrow OLR$ $X \rightarrow EL$

Because of these structural possibilities, it is not reasonable to conclude that the correlation between *OLR* and the various *EL* values is truly “failure to reject” the hypothesis. Indeed, when regressed against the various reenlistment rates, *Officer Loss Rate* tends to have positive correlation with all three! While the effect is as expected in the case of the other loss rates, the effect works in the opposite direction for reenlistment rates (not statistically significant, but still opposite) and seems to indicate that *Officer Loss Rate* does not drive retention.

Another item of note is that the controls have very little impact. In all cases, the coefficients are relatively small and none are statistically significant. The fact that income per-capita has no significant effect may indicate that various States are “sweetening the pot” to balance the effect. For example, Massachusetts, with its high income per-capita, may give State-sponsored benefits to its Guardsmen at higher rates than New York in order to offset the increased opportunity costs borne by its Guardsmen. It is also possible that more units are located in States with lower per-capita income, increasing the ability to draw on and retain lower-income people to serve. Testing either hypothesis would require more data than are currently available. The lack of a significant effect due to the political proxy may be because the proxy measures the State and not the Guard that serves in that State. The Guardsmen in a State are not a random cross-section of that State’s population. Again, there is no way to correct for this absent a voting

sample of Guardsmen from each State. Finally, the controls may have no effect because in reality, they do not affect retention.

CHAPTER 6

CONCLUSION

The strongest evidence that mobility is indeed a factor in retention comes from the effects of the ordered mobility proxies on reenlistment rates. While mobility also affects loss rates, it is important to remember that loss rates can occur for any reason. Mobility is only expected to have an impact when a soldier is up for reenlistment. The reenlistment rates are where the proverbial rubber meets the road and, as demonstrated, mobility has a strong negative impact on reenlistment.

So What?

When an R&R²⁴ Command tries to increase retention, they usually use financial incentives. Battalions often try to promote soldiers or move them to a new, more exciting job. Perhaps both of these organizations should try isolating battalions to keep soldiers' mobility low. Such a reorganization would not be costless; however, a chance to avoid a 40% hit to reenlistment may be worth it. Short of reorganizing the entire National Guard, there may be other more recognizable economic ways to ensure the commitment of soldiers and increase retention.

The National Guard is, for the majority of soldiers, a part-time job. Soldiers have the ability to transfer so that they can pursue increased rank or new work opportunities. Simply refusing transfers to soldiers would not work given the current personnel

²⁴ Recruiting and Retention

management system used by the Army. So without reorganizing the Guard or basically making soldiers serve in only one battalion against their will, how do we solve this problem?

Solutions

One possible solution would be some type of contract. Currently, there is no ability for a soldier to commit to stay with a specific battalion in any State. If soldiers had this ability, their officers would be able to see that commitment and adjust appropriately. This contract would only be for those soldiers who want that ability to commit and signal their desire to have whatever possible investments made in them. The down-side of any contract is performance when the situation changes. How would this contract be enforced if a Guardsman loses his civilian job and must move to another State? Also, would this system that is more restrictive on soldiers get past whatever board makes such decisions? These questions remain without answers.

Another potential solution might be to relax personnel regulations and give commanders more discretion in these matters. That would give officers a greater ability to invest in soldiers by rewarding them with better positions, bonuses and the like. Clearly, the tradeoff here is the increased risk of nepotism.

To see the big picture, let us step back and remind ourselves what the National Guard is. Basically, the Guard is a large bureaucratic organization with various subsections between which employees can move. Also, it is an organization that invests in the human capital of its workers and has ample reason to retain these workers. A good understanding of the commitment vs. monopsony tradeoff in such organizations as well

as the incentives given to managers under these conditions has value far beyond the ranks of the National Guard.

Areas of Future Study

In considering areas of future study, I have divided commentary into improvement on this project and potential tangential projects. The two major improvements to this study would be information on the command climate and State-level compensation. Potential projects have a larger scope, but two interesting areas include the value of a veteran and the specific human capital that the Army chooses to give soldiers.

Improvements

The reader has probably noticed the low R-squared values in the regressions. While the statistics are certainly interesting, the variables used are not explaining all the variation in the data. As a member of the military, I would suggest that the command climate of a unit may be a culprit. The command climate of a unit certainly affects retention. A good commander can, through good leadership, character and competence, inspire soldiers to reenlist. Similarly, a bad commander can push out the marginal soldier who otherwise might have stayed. The Guard routinely conducts command climate surveys. These surveys show statistics on how the members of a unit feel about their commander and the unit in which they serve. This information would be very interesting and would add to the study. One would expect a strong correlation between positive command climate feedback and high retention rates. Unfortunately, these survey results

are the property of company commanders. Each company commander would have to be contacted in turn. Obtaining this information is prohibitively costly with respect to time. Also, commanders whose units had poor feedback might be reticent to provide it relative to commanders whose units responded positively.

Because the National Guard is a State Institution as well as a federal one, the several States support their respective Guard establishments. Obviously, as with any other form of remuneration, this is to encourage people to provide the service in question. Many of the States support their Guard elements in addition to the federal support received by that unit. However, the amount of support and the method of support each vary from State to State.

For example, the State of Montana gives a scholarship to all Montana Guardsmen who maintain a 2.0 or better. The State of Arizona gives free tuition to Arizona Guardsmen at State schools, but not private schools. The State of California pays half of the health insurance premium of California Guardsmen who purchase Tricare Reserve, which is the military health plan for Reserve Component soldiers. Montana, Idaho and Utah reimburse their respective Guardsmen for tuition up to a certain amount. Some States have benefits only for enlisted men or enlisted men and NCOs. Some States pay their soldiers double when serving in a militia capacity, such as fighting fire or evacuating the State's citizens during a natural disaster. The list is as long and diverse as the number of States, but no two States are the same.

All of the data points in this analysis are considered as homogenous. Clearly, the benefits given by a State to its Guardsmen will change retention rates in ways not

measured by any independent variable (except, perhaps the measures of income and partisan leanings).²⁵ Adding State-by-State data on State-sponsored benefits would correct this problem but would do so at an unacceptably high cost.

Future Studies

A great area of future study would be to attempt an answer of an excellent question posed by one of my fellow graduate students. He asked, “How much is a veteran worth?” Clearly, that question is intriguing. We talk a great deal about retention in the military. A lot of time and effort is spent keeping soldiers in the Guard. However, it is difficult to know what the efficient level of retention is if we cannot quantify the benefits. Such a study might take the form of a careful analysis of casualty rates in Iraq, Afghanistan or some other theater. Presumably, casualty rates would decrease as the unit measured shows higher experience. Such values could then be balanced against known value-of-life studies.

Another area that would be very interesting is the application of specific human capital in the military. There are many things that we do in the military that are not really applicable to civilian life. Our decision-making process, the MDMP,²⁶ is an area where staff officers and NCOs need to excel. A soldier who is good at driving this process is incredibly valuable to a battalion. However, this process is not widely used in the civilian world and does not really transfer easily. Some Army training, on the other hand, is valuable outside the Army. The Army’s Business Transformation Program is based on

²⁵ The regressions used most for actual analysis, however, are clustered by State, which should reduce this problem when evaluating statistical significance.

²⁶ The Military Decision-Making Process, per FM 3-0 (Operations).

the Six Sigma system, which is highly sought-after in civilian markets. Leaders in the Army are also taught management skills in academic and applied settings; skills which probably transfer easily. Also, some human capital is specific only to certain units. A Master Gunner is a soldier who is an expert on the heavy weapons of a specific unit. He is not very valuable to a unit that does not have these weapons. Tangentially applicable to this study is the question of whether a unit would invest more of the specific capital in a soldier, relative to the general capital. For example, do battalions send more soldiers to Master Gunner school than they send to Six Sigma training? Economic theory tells us that they probably do. A statistical test would be revealing.

Conclusion

The impact of mobility on retention has been shown to be statistically significant over a range of different proxy measurements. The ability of soldiers to commit to remain with a battalion seems to be a factor in the amount of work that battalions do to retain them. This is consistent with economic orthodoxy. There are various possible ways in which the Army could make it easier for Reserve Component soldiers to make a commitment to stay with their current battalion, which would make them more valuable to that battalion and more likely to be retained. One of these ways would be a simple contractual arrangement in the reenlistment contract. This would reduce a soldier's mobility but give him the ability to commit to his contract. Another method would be to reorganize the National Guards of the several States to limit the ability of soldiers to move to similar units or jobs. This would probably be prohibitively expensive in

pecuniary and organizational costs. The fact that there is an apparent public-vs.-private-good problem is an issue that needs to be addressed in the Army's personnel management system.

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APPENDICES

APPENDIX A

DATA TABLES

Table 1. Dependent and Control Variables.²⁷

Variable	Mean	Standard Deviation	Min	Max	Observations
First Term Losses ²⁸	13.78	8.16	0	120	581
Careerist Losses	19.01	7.98	0	105.9	581
Loss Rate	19.26	7.69	2.7	120	581
Enlisted Loss Rate	20.15	8.03	3.1	120	581
Officer Loss Rate	9.01	7.10	0	42.9	581
Reenlistment Rate ^{29,30}	91.45	52.18	0	600	570
Obligor Reenlistment	88.22	73.22	0	800	570
Careerist Reenlistment	91.58	49.42	0	400	570
Red State Percentage ³¹	53.40	8.07	9.3	71.5	567
Income Per-Capita	38.57	5.22	23.91	64.15	581

²⁷ This table shows the basic descriptive statistics for the dependent and control variables.

²⁸ For all loss rates, a value of greater than 100% is possible. The likely explanation is that the unit in question was reorganized and used during the reporting period as a holding unit. When the various soldiers in this unit transferred away, they were all counted as losses.

²⁹ Please see the text on page 21 for an explanation of reenlistment rates higher than 100%.

³⁰ The data set includes some voids in which units reported loss rates but not reenlistment values. This explains the different number of observations.

³¹ Data for the presidential election covered only States with electors. As such, Territories were not observed in this value.

Table 2. In State Unit (dependent variables).³²

	Mean (isunit = 1), 233 observations	Mean (isunit = 0), 337 observations
First Term Losses	13.76 0.47	13.55 0.36
Careerist Losses	19.88 0.50	18.18 0.36
Loss Rate	19.59 0.40	18.52 0.29
Enlisted Loss Rate	20.40 0.41	19.44 0.32
Officer Loss Rate	9.81 0.55	8.54 0.31
Reenlistment Rate	84.05 2.75	96.57 3.14
Obligor Reenlistment	77.45 4.20	95.67 4.25
Careerist Reenlistment	89.37 3.25	93.10 2.68

³² This table shows a comparison of means with standard deviations given the two possible states of *ISUnit*.

Table 3. Various Loss Rates Regressed against Mobility Proxies
and *Officer Loss Rate*.³³

	First Term Losses	Careerist Losses	Loss Rate	Enlisted Loss Rate	Officer Loss Rate
IS MOS	0.77 0.78	1.466 1.54	1.259 1.34	0.81 0.83	0.334 0.38
IS Unit	-0.138 -0.14	0.517 0.54	0.795 0.84	0.86 0.88	0.769 0.88
AS MOS	0.223 0.14	-0.337 -0.21	0.119 0.08	0.035 0.02	-0.571 -0.40
AS Unit	-0.209 -0.15	0.86 0.63	0.112 0.08	0.401 0.29	-0.399 -0.32
Off. Loss Rate	0.173 3.65	0.22 4.80	NA	0.165 3.55	NA
Const.	11.791 11.14	15.556 15.27	17.989 19.77	17.473 16.83	9.291 11.01
Obs	580	580	580	580	580
R squared	0.025	0.055	0.015	0.033	0.007
R squared (adj)	0.017	0.047	0.008	0.024	0.000

³³ This table shows the various loss rates regressed against the explanatory variables. Estimated coefficients and t-statistics are shown. Because these values are not the ordered proxies, there is multicollinearity that will be reduced in Table 8.

Table 4. Reenlistment Rates Regressed against Mobility Proxies
and *Officer Loss Rate*.³⁴

	Reenlistment Rate	Obligor Reenlistment	Careerist Reenlistment
IS MOS	-8.02 -1.28	-7.528 -0.85	-3.164 -0.53
IS Unit	-5.457 -0.86	-12.427 -1.39	-0.574 -0.09
AS MOS	-15.388 -1.47	-6.963 -0.47	-9.098 -0.91
AS Unit	-11.99 -1.33	-16.32 -1.28	-10.85 -1.25
Off. Loss Rate	0.044 0.14	0.936 2.14	0.241 0.81
Const.	120.762 17.83	108.197 11.31	107.935 16.60
Obs	569	569	569
R squared	0.051	0.038	0.024
R squared (adj)	0.042	0.030	0.015

³⁴ This table shows the reenlistment rates regressed against the explanatory variables. Estimated coefficients and t-statistics are shown. Note the greater effect on the reenlistment rates compared with the loss rates (previous table). This is no doubt due to the diminished noise in reenlistment rates.

Table 5. Loss Rates Regressed against Mobility Proxies Only.³⁵

	First Term Losses	Careerist Losses	Loss Rate	Enlisted Loss Rate	Officer Loss Rate
IS MOS	0.83	1.54	1.26	0.87	0.33
	0.83	1.58	1.34	0.88	0.38
IS Unit	-0.01	0.69	0.80	0.99	0.77
	-0.01	0.70	0.84	1.00	0.88
AS MOS	0.12	-0.46	0.12	-0.06	-0.57
	0.07	-0.29	0.08	-0.04	-0.40
AS Unit	-0.28	0.77	0.11	0.34	-0.40
	-0.19	0.56	0.08	0.24	-0.32
Const.	13.40	17.60	17.99	19.01	9.29
	13.79	18.65	19.77	19.95	11.01
Obs	580	580	580	580	580
R squared	0.002	0.017	0.015	0.011	0.007
R squared (adj)	-0.004	0.010	0.008	0.005	0.000

³⁵ This table is similar to Table 3 with the exception of *Officer Loss Rate*. Estimated coefficients and t-statistics are shown.

The following table shows reenlistment rates regressed against mobility proxies only.

Table 6. Reenlistment Rates Regressed against Mobility Proxies Only.³⁶

	Reenlistment Rate	Obligor Reenlistment	Careerist Reenlistment
IS MOS	-8.01 -1.28	-7.40 -0.83	-3.13 0.52
IS Unit	-5.40 -0.86	-11.32 -1.27	-0.29 -0.05
AS MOS	-15.45 -1.48	-8.31 -0.56	-9.45 -0.94
AS Unit	-11.97 -1.33	-15.88 -1.24	-10.74 -1.24
Const.	121.17 19.82	116.95 13.49	110.19 18.75
Obs	569	569	569
R squared	0.050	0.038	0.023
R squared (adj)	0.044	0.030	0.016

³⁶ This table is similar to Table 4, excepting *Officer Loss Rate*. Estimated coefficients and t-statistics are shown.

Table 7. Various Dependent Variables vs. IS Unit.³⁷

	First Term Losses	Careerist Losses	Enlisted Loss Rate	Reenlistment Rate	Obligor Reenlistment	Careerist Reenlistment
IS Unit	0.43	1.82	1.63	-13.32	-20.19	-4.47
	0.6	2.7	2.37	-2.99	-3.28	-1.02
Off.LossRate	0.19	0.22	0.17	0.15	0.94	0.37
	3.9	4.73	3.55	0.49	2.17	1.21
RS_Perc	0.05	-0.05	-0.05	0.43	0.2	0.02
	0.81	-0.82	-0.73	1.08	0.36	0.05
IncPC	0.13	0.08	0.05	-0.18	-1.02	-0.52
	1.26	0.77	0.51	-0.27	-1.13	-0.81
Const.	4.16	16.14	18.52	78.4	115.14	108.89
	0.6	2.42	2.73	1.8	1.91	2.54
Obs	567	567	567	556	556	556
R squared	0.029	0.056	0.036	0.019	0.03	0.007
R squared (adj)	0.022	0.051	0.029	0.012	0.023	0.001

³⁷ Because *ISUnit* is considered the most relevant of the explanatory variables, this table shows the various loss rates and reenlistment rates regressed only against *ISUnit* and the controls.

Table 8. Various Loss Rates Regressed against the Ordered Mobility Proxies and Demographic Controls.³⁸

	First Term Losses	Careerist Losses	Loss Rate	Enlisted Loss Rate	Officer Loss Rate
IS Unit	1.81 1.41	1.95 1.82	2.23 2.08	2.01 1.77	0.13 0.11
ISMOSno	1.97 1.49	1.00 0.95	1.17 1.21	0.82 0.77	-0.69 -0.49
AS Unit nois	1.42 1.31	-0.22 -0.26	0.13 0.16	0.28 0.31	-0.94 -0.72
AS MOSonly	-0.32 -0.21	-2.10 -1.63	-0.88 -0.64	-1.00 -0.68	-1.62 -0.77
OffLossRate	0.19 2.37	0.22 3.94	NA	0.17 2.27	NA
RS Perc	0.06 0.53	-0.05 -0.65	-0.06 -0.71	-0.05 -0.51	-0.11 -1.57
Inc PC	0.13 0.85	0.07 0.58	0.00 0.02	0.05 0.35	-0.16 -1.44
Constant	2.39 0.21	16.66 1.91	21.50 2.25	18.31 1.78	21.22 2.81
Obs	566	566	566	566	566
R squared	0.025	0.062	0.018	0.037	0.01

³⁸ This table shows loss rates vs. ordered mobility proxies. Due to the use of the ordered proxies, there should be reduced multicollinearity among the regressors. Also, these results are based on clustering by State. Note that there are statistically significant results despite the clustering. Again, estimated coefficients and t-statistics are shown.

Table 9. Various Reenlistment Rates Regressed against the
Ordered Mobility Proxies And Demographic Controls.³⁹

	Reenlistment Rate	Obligor Reenlistment	Careerist Reenlistment
IS Unit	-39.24 -4.00	-27.96 -1.94	-23.03 -2.04
ISMOSno	-30.12 -3.13	-10.17 -0.68	-19.70 -1.62
AS Unit nois	-28.51 -2.81	-8.00 -0.51	-21.50 -1.88
AS MOS only	-28.93 -1.70	-6.87 -0.31	-19.03 -1.14
Off. Loss Rate	0.11 0.30	0.92 1.61	0.35 1.00
Red State Percentage	0.27 0.50	0.16 0.17	-0.10 -0.19
Income Per Capita	-0.40 -0.46	-1.08 -0.73	-0.67 -0.77
Constant	121.95 2.10	127.64 1.24	139.81 2.37
Obs	555	555	555
R squared	0.037	0.031	0.016

³⁹ This table shows reenlistment rates vs. ordered mobility proxies. Estimated coefficients and t-statistics are shown. Again, there is reduced multicollinearity among the regressors. Also, the results are based on clustering by State. Note the strongly significant results between *ISUnit* and all the various reenlistment rates.

APPENDIX B

A DETAILED INTRODUCTION TO THE ARMY

The United States Army is the land-based element of the United States military. The Army provides landpower to the joint force. According to Field Manual (FM) 1, “Landpower is the ability - by threat, force or occupation – to promptly gain, sustain and exploit control over land, resources and people.”⁴⁰

The Army’s Three Components

The Army is comprised of three distinct elements. These elements are the Active Component (AC), the Army National Guard (ARNG, or simply, “The Guard”) and the Army Reserve. The Army National Guard and Army Reserve are collectively referred to as the “Reserve Component.” Each of these elements is comprised of soldiers and DA civilians⁴¹. While DA civilians are important and play a key role in today’s Army, they will not be covered in this study. The soldiers listed are commissioned officers, non-commissioned officers (NCOs) and enlisted men.⁴²

Every State has a National Guard. Also, every Territory and the District of Columbia also have National Guard forces⁴³. The National Guard has a unique “dual

⁴⁰ FM 1: The Army

⁴¹ That is, Department of the Army (DA) civilians. These are people who work for the Army in a civilian status.

⁴² A brief note on terminology is necessary. There are many armies. The capitalized “Army” in this paper will at all times refer to the United States Army, to include its Active and Reserve Components. The Active Component of the Army is sometimes referred to as “the Active Duty.” This is technically not correct, as a Reserve Component unit that is activated by the President is on “active duty.” While the terminology is common and understood in military circles, I will refrain from using and attempt correct usage in this paper. It is common for Army documents to refer to the members of the Army as “Soldiers.” The idea is that common nouns are not capitalized and there is nothing common about our soldiers. While this is certainly a practice with low cost and good motivation, I will not follow it in this paper as I am not writing an Army publication.

⁴³ In this paper, unless Territories and the District of Columbia are specifically omitted, it is understood that they are included in references to “States.” Another point is, for each State and Territory, that State’s National Guard consists of its Air National Guard and its Army National Guard. While it is technically

role”, in that it answers both to the President of the United States and the Governor of its respective State as civilian authority.

Founded on June 14, 1775, the Active Component of the United States Army is the federal component of the Army. The Active Component of the United States Army is the full-time part of the Army. These soldiers work on a full-time basis, conducting training, maintenance and field exercises. They live on or around Active Component posts, such as Fort Benning, Fort Bragg or Fort Knox. Any vacation from the Army is had by taking leave. While deployment rates vary, I would estimate that Active Component soldiers currently would be deployed outside of the continental United States one year in every three.

The Army National Guard traces its lineage to the first official muster of militia of the Massachusetts Bay Colony on December 13, 1636. As part of the Reserve Component, the Army National Guard is part of the part-time element of the Army. Guardsmen train, or “drill”, one weekend a month and two weeks a year. Guardsmen are found across the nation; not limited to areas near Army posts. Many Guard units have been deployed on federal missions Outside the Continental United States (OCUNUS). The Army’s official policy is to limit Guard OCONUS deployments to one year in every six. The Guard is also routinely deployed in the United States to replace elements of the Active Component deployed overseas. Finally, the Guard has a dual mission. The Guard

incorrect to refer to a State’s Army National Guard simply as “The Guard”, that is a convention that will be used in this paper. Also, members of the National Guard are referred to as “Guardsmen.” In this paper, this reference will be only to members of the Army National Guard. This certainly is not meant to downplay the contributions of the respective Air Guards of the several States, but it is common terminology that is widely understood in the military. Finally, the term “enlisted men” will refer to only private soldiers and specialists. While NCOs are enlisted, the term “enlisted man” commonly refers to soldiers of a lower grade. That convention will be observed in this paper, as well.

serves at a Federal level and it also serves the State. Guard units are routinely activated by their respective States in cases of natural disaster, riots and to secure the border with Mexico.

The Army Reserve is a Federal organization. Like the Active Component, it has no State-level mission. Soldiers in the Army Reserve drill one weekend a month and two weeks a year, much like the Guard. Army Reserve armories are widely dispersed. As such, Army Reserve soldiers, like Guardsmen, can be found just about anywhere in the country. Unlike the Active Component and the Army National Guard, the Army Reserve has no combat units. The Army Reserve has units that perform military intelligence, quartermaster, transportation and aviation functions, but no armor, infantry or cavalry. Army Reserve units typically deploy on a rotation similar to that of the Army National Guard.

The Army Reserve has two parts. One part is the aforementioned active drilling part. Another part is the Individual Ready Reserve, or "IRR." The IRR is basically a long list of soldiers who may contractually be recalled to active service. It is made up of commissioned officers who have retired and enlisted people that were required to serve time in the IRR in their enlistment. Individual soldiers can be called from the IR to fill gaps in deploying units. Soldiers in the IRR do not drill or conduct any other training. They are simply on a list and can be recalled to active service at the order of the Army. While the IRR was not routinely used during the Cold War, the Global War on Terror has greatly increased activations from the IRR. IRR activations have increased to a great extent. This is to the point where soldiers with key skills, such as infantry, Special

Operations, military intelligence, military police and aviation, basically have to serve out their entire enlistments instead of serving time in the IRR. Officers who retire as company-grade officers (lieutenants and captains) are, depending on their skill sets, almost guaranteed to be activated once their names show up on the IRR list.⁴⁴

Army Personnel

The Army has two kinds of soldiers: commissioned soldiers and enlisted soldiers. Commissioned soldiers include commissioned officers and warrant officers. Warrant officers above the junior grade are given a commission and the technical differences between warrant officers and so-called “commissioned officers” are not relevant to this report. For the sake of brevity, all commissioned personnel will be referred to as “officers.”

Officers serve for as long as they hold their commissions. While officers can retire after their initial mandatory service, they can be called back to Active Duty based on the needs of the Army. The only sure way to have no possible further service obligation for an officer is to resign his commission.

Officers are required to have college degrees. Because of this and the generous scholarships offered by commissioning programs, most officers come to the Army from schools. This is done through programs like the United States Military Academy (USMA) at West Point and the Reserve Officer Training Corps (ROTC) at colleges and universities around the country. The remainder of officers, after completing their

⁴⁴ See AR 600-8 and AR 601-10.

respective degrees, attends a short training program known as Officer Candidate School (OCS).

Enlisted soldiers include enlisted men (privates) and non-commissioned officers (NCOs). Non-commissioned officers include corporals, sergeants and sergeants major. These are the enlisted men who lead.⁴⁵ Privates, privates first class and specialists make up the majority of the Army. These are the rank-and-file soldiers who actually do the work.

A person is enlisted because he signs enlistment papers. These papers are a contract. Enlisted people serve for the amount of time required in their respective contracts. Enlistment contracts, or simply “enlistments,” can be from one to eight years in duration. Some enlistments require all service to be active while some require active time followed by time in the IRR. Most soldiers, upon entering the military for the first time, enlist for four or eight years. Recently, the Army has offered entry-level recruits a two-year option. One-year enlistments are only offered to soldiers with prior service. An enlisted person is obligated by his contract to serve until his End Term of Service (ETS). This is the date when he is no longer in the Army. There are some caveats to this. A soldier whose unit is soon to deploy may be “Stop Lossed”. This means that his time has been extended.⁴⁶

⁴⁵ A Non-commissioned Officer (NCO) has a grade of E-4 or above. A private soldier has a grade of E-4 or below. These terms will be used to show specific ranks later in the paper.

⁴⁶ Military enlistments have traditionally included clauses allowing the government to extend a soldier’s enlistment indefinitely given military need. By way of note, this is the so-called “Backdoor Draft” referred to by Senator Kerry in his 2004 Presidential run.

Entry-level enlisted people are required to have high school diplomas or GEDs. The job of a private is an entry-level position. As such, young people who are ready to begin work usually apply for these jobs. New enlistees come from all over the country. When a soldier is within two years of his ETS, he is given a chance to reenlist if he has served honorably. When a soldier reenlists, he is considered “retained.”

Retention in the Army

Retention is very important to the Army. While recruits are usually forthcoming, a recruit must be trained and socialized in Army regulations and doctrine. Soldiers who are retained do not have this requirement because they have already had their initial entry training. Because of this, the retention of enlisted men is important to a unit’s readiness. The retention of NCOs may be even more important. To develop an enlisted man to the point where he is ready to lead other soldiers and serve as an NCO takes many years and considerable training. This time and money spent developing a soldier’s human capital will be sunk even if he does not stay in the Army.⁴⁷ Also, his experience and leadership abilities leave a hole in the unit that must be filled. While there are many NCOs that could fill this gap, there are not an infinite number and their abilities are scarce. Every NCO not retained must be replaced via promotion or transfer. This shows the importance of retention, both with NCOs and enlisted men.

Officers are also retained, but the process is different than enlisted and NCO retention. Officers usually enter the Army as Second Lieutenants. While some

⁴⁷ More precisely, this human capital goes to the private sector or other government agency. The important thing is that it does not stay with the Army.

professionals, such as lawyers, doctors and ordained clerics, may enter at a higher rank, the vast majority enter at the level of a Second Lieutenant, the lowest-ranking commissioned officer. Officers do not face reenlistments. An officer serves in one capacity for a time. Once his commander or S-1 director thinks he has been in that position for long enough, he is moved to another position. Officers, when given good Officer Evaluation Reports (OERs), are promoted after they have the requisite time in service.

Officers retire from the military in two ways. An officer is automatically retired if he fails to pass his promotion board twice. For example, if an officer fails to pass his captains' board twice as a lieutenant, he would be automatically inactivated and moved to the IRR⁴⁸. Also, an officer may put in a retirement packet. This is basically a request for transfer to the IRR. Again, being in the IRR as a company-grade officer (a lieutenant or a captain) does not necessarily mean that you are by any means "out" of the Army.⁴⁹

Officers can also leave the Army through resignation. Resigning one's commission is usually considered a drastic step as most military and Veteran's Administration benefits are cut upon resignation. Resignation, once quite rare, is becoming a more popular option given the increased recruitment from the IRR. This change seems to be a recent phenomenon, apparently having originated after 9/11. This is a microcosm of the Army's current need to develop new retention strategies for a new war.

⁴⁸ AR 600-8-24

⁴⁹ While field-grade (higher-ranking) officers can be recalled, this practice is not as common. Also, see AR 601-10.