Leaders: Privilege, Sacrifice, Opportunity and Personnel Economics in the American Civil War

Dora L. Costa

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Dora L. Costa[*]

UCLA and NBER

costa@econ.ucla.edu

Abstract

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US Civil War data allow examinations of theories of leadership. By observing both leaders and followers during the war and forty years after it, I establish that the most able became wartime leaders, that leading by example from the front was an effective strategy in reducing desertion rates, and that leaders later migrated to the larger cities because this is where their superior skills would have had the highest pay-offs. I find mixed evidence on whether leaders were created or born. I find that US cities were magnets for the most able and provided training opportunities for both leaders and followers: men might start in a low social status occupation in a city but then move to a higher status occupation.

They were the leaders of men, these great ones ...

Carlyle (1840: 3)

A favorite quotation of the many web sites devoted to leadership is, "Real leaders are ordinary men with extraodinary determination."[1] Prior generations celebrated both the superior cognitive and non-cognitive skills of leaders. Carlyle (1840: 3) wrote of "Great Men." Galton (1869: 141), in discussing military leaders, wrote of men "excelling in many particulars," including energy, political capacity, charisma, intellect, and will. A heirarchical organization such as the military or a firm should assign the "real leaders" to the highest ranking positions so that their reach is stretched over a larger reach of the organization's activities (Rosen, 1992). But, as Galton (1869: 143) recognized, the incentives may not always be there. In times of peace or during short wars, political patronage may determine military positions. A firm with monopoly power may dissipate its rents on poor managers. The difficulty facing researchers on leadership is that it is hard to identify the real leaders – non-cognitive skills are hard to measure and an observed leader may not necessarily have achieved his position through superior skills.

This paper uses data on Union Army soldiers to investigate theories of leadership. It examines the characteristics of men who were promoted to leadership positions and looks at what made leaders effective. It examines whether, after the war, leaders are found in the larger cities where their superior decision making skills would have had the highest payoff. I can thus determine whether in the American past cities were magnets for the skilled as they are today (Gould, 2007). Because the US Civil War was a prolonged war with civilians (largely self-taught) filling the ranks of commissioned and non-commissioned officers, it provides a unique opportunity to identify the real leaders. Because all records are in the public domain (unlike WWII records) and because I follow men for 40 years, I can determine whether wartime leaders became civilian leaders and where they move after the

war. By predicting who would have become a leader even with no regimental casualties and who became a leader only with regimental casualties, I find mixed evidence on whether leaders are born or created.

A vast literature examines the traits of who becomes a leader, describes leadership styles, analyzes what makes leaders effective, and models the matching of leaders and organizations. Traits that distinguish leaders from others include physical energy, intelligence (including social intelligence) greater than that of the average follower, motivation, self-confidence, and flexibility (House and Aditya, 1997). Although an emphasis on personality characteristics suggests that leadership is innate, if leaders are judges, experts, and co-ordinators (Hermalin 2007) or simply people who make right decisions more often (Lazear, 2010), leadership can be learned.

Game theoretic models of leader effectiveness have emphasized that one way to elicit effort from followers is to lead by example (Hermalin, 2007). The density and range of Civil War firearms made exposure suicidal and the leadership skills of great generals evolved with the technology, no longer centering on leading charges or needless exposure to the line of fire (Keegan, 1987: 164-234). Nonetheless, Civil War scholars have emphasized the importance of both non-commissioned and commissioned officers such as colonels or captains motivating troops by showing courage under flying bullets (Linderman, 1987: 44-45; McPherson, 2007: 145-54). Scholars have pointed out that US officers' not sharing the danger in WWII became a cause for resentment (Linderman, 1999: 197) and may have reduced the US Army's tactical proficiency relative to the Wehrmacht (Muth 2011).

Models of sorting explain the observed characteristics of leaders and their organizations. In Lucas's (1978) model, the largest firms have the best managers because as capital increases wages rise relative to marginal managerial returns thus inducing marginal managers to become employees. Rosen (1982) showed that the more talented will sort to top

positions in larger firms where their greater talent filters through the entire firm through the recursive chain of command. Lazear (2010) emphasizes not firm size but that the better leaders will sort to the highest variance industries because this is where decision making has the highest payoff. After the US Civil War, decision making should have had the highest payoff in the larger cities which offered greater diversity in manufacturing industries (the dominant economic activity) and higher wages (Kim 2006).

1   Officers in the Civil War

Regiments, the basic unit of the Civil War Armies, were formed locally. The volunteer infantry regiments consisted of ten companies, each containing roughly 100 men, commanded by a captain and two lieutenants. Each company had four sergeants, one of whom served as company first sergeant, a sergeant major, a quartermaster sergeant, a commisary sergeant, four corporals, a hospital steward, two musicians, and one wagoneer. The non-commissioned officers included corporals and sergeants and the commissioned officers were ranks of lieutenant and higher. The commissioned officers were often volunteer officers drawn from state militias, men of political significance, or other prominent men in the community. Sometimes the enlisted men elected their own officers. Generally, state governors appointed the commissioned officers and the commissioned officers selected the non-commissioned officers. After the first major battles, state governors began to commission officers from the ranks of noncommissioned officers who had proved themselves in the field and in battle (Fisher, Jr., 1994: 109). Among Ohio companies, the major predictors of promotion to non-commissioned officer were a non-farm and non-laborer occupation and literacy (Lee, 1999).

Commissioned and non-commissioned officers performed all five of the leadership ac-

tivities defined by Hermalin (2007): they served as judges, experts, co-ordinators, symbols, and shapers of preferences. Officers had to judge men for absences without leave, crimes, and desertion; they had to become experts in military tactics (both commissioned and non-commissioned officers would take lessons nightly studying from various training manuals); they had to ensure that their men had adequate supplies, they had to file reports, and in the field they had to maintain unit direction and cadence and see to it that the men fired upon order; the regimental color bearer (a sergeant) was the rallying point for the men in the regiment (and the regimental flag enabled regimental and division officers to see where a regiment was in a battle); and, the colonel was supposed to have "a personal acquaintance with every officer and man" (Sherman, 1891: 385). Officer positions required not just technical skills but also people skills. Samuel Pryce whose longest war service was as the regimental adjunct wrote, "The details made by the sergeant major, the distribution of clothing by the Q-M sergeant, and the dispensation of food by the commissary sergeant were positions requiring the highest skill and tact, to avoid complaints" (Pryce, 2008: 32).

Officers could not expect to enforce their will on their men. Men who elected their own officers could just as easily dismiss them. Officers who commanded contempt because of their cowardice or disregard for the welfare of their men resigned their commissions, driven out by their men's ill will. When John Beatty, lieutenant colonel of the Third Ohio, began to court martial men who left camp without leave, he faced "not only the hatred and curses of the soldiers tried and punished but in some instances the ill will of their fathers, who for years were my neighbors and friends." He only aggravated insubordination as men extended their absences, refused to drill, and signed petitions demanding his resignation (Linderman, 1987: 41). He later gained the regiment's respect when at Perryville he ordered his men to the ground while he remained standing under "shot, shell, and canister ... thick as hail" (Linderman, 1987: 44-45).

Sergeants and commissioned officers were paid more than enlisted men and lived in different quarters in the same camp (Smith, 2003). At the start of the war infantry privates and corporals were paid $13 a month, sergeants $17, first sergeants $20, and lieutenants and captains over $100 (Boatner, 1991: 624). Privates in an army camp were grouped by company. There were separate rows for the noncomissioned officers, commissioned officers of the companies, and the staff and commander of the regiment, who were located in front of the baggage train. Officers used their own funds to purchase food and ate at separate messes from the men. The latrines for officers were behind the baggage train whereas those for enlisted men were at the opposite end of the camp. Smith (2003) finds disease death rates of 65.4 per 1000 for enlisted men in New York Regiments compared to 23 per thousand for their commissioned officers. Lee (1999) finds that in a sample of Ohio companies four percent of non-commissioned officers died of disease compared to 9 percent of privates.

The ranks of enlisted Union Army infantrymen (excluding the men who entered as commissioned officers and are not in my sample) were more likely to include artisans and the foreign-born and were less likely to include professionals and proprietors compared to age-eligible northern white men in 1860. They were also more likely than the general population to be from pro-Lincoln counties. However, the sample is representative in terms of wealth and literacy rates (Costa and Kahn, 2008: 36, 52). Perhaps professionals and proprietors and the native-born were more likely to serve in the artillery or cavalry or as commissioned officers. Service rates during the Civil War were high. Roughly 65 to 98 percent of the cohorts born between 1838 and 1845 were examined for military service and 48 to 81 percent of these cohorts served; the remainder were rejected for poor health (Costa and Kahn, 2008: 36).

2   Economic Framework

The military is an internal labor market with few ports of entry and with promotion largely from within (Rosen, 1992). In a strongly heirarchical organization with a chain of command structure, it is efficient to assign the most able individuals to the highest ranking and most influential positions in the organization because their reach is stretched over a larger portion of the organization's activities. Selection of personnel to the highest ranks is thus more important than selection to the lower ranks. Because talent is revealed only slowly and because advancement depends on the number of available positions, the promotion mechanism is an elimination tournament. The reward for any given rank is the weighted sum of rewards attained at all ranks higher than the current rank, with weights depending on the conditional probability of surviving to compete at those higher levels. Because competition is tougher at each step, the earnings structure has to give more than proportionally greater awards to those who achieve higher rank. The jump in earnings between a the $20 per month earned by first sergeant and the more than $100 earned by a lieutenant is consistent with a tournament model.

Both commissioned and non-commissioned officers should have been more skilled than privates prior to joining the army and the more skilled should achieve higher ranks. Promotion should depend on the demand for officers which will in turn depend on how much action the regiment saw. Both officers and non-commissioned officers should have more privileges than enlisted men. Because these privileges meant different food and separate quarters and because of the strong relationship between sanitation and disease in the nineteenth century, officers should face a lower probability of death from disease. Unless monetary compensation was very high they should also face a lower overall risk of death. The compensation differential between privates and both commissioned and non-commissioned

officers is thus even starker than suggested by the pay scale.

Officers might lead by example to signal to their followers that victory is achievable or that the risk of death is not high. Hermalin (2007) shows that in a game theoretic model in which the leader's actions reveal the true state of nature to the follower, the harder the leader works the harder the followers work. If the leader's actions do not fully reveal the state and their payoff depends on the efforts of other team members, followers will mimic the leader whereas they would not if they knew the true state (Komai et al., 2007). With perfect mimicry, the battlefield mortality of officers and privates will be similar, though going first will increase mortality. The non-commissioned officers who were regimental flag-bearers should have a higher mortality rate than privates because they were good targets. Officers' battlefield mortality could be lower or higher than that of enlisted men if, on average, men do not follow or officers do not lead by example.

Leading by example can be efficient (see the review by Hermalin, 2007). If it is an effective strategy then desertion rates (which averaged ten percent for the Union Army) should be lower for companies where a higher fraction of officers relative to enlisted men were killed controlling for the death rate.

How successfully military training can be transferred to the civilian sector remains an open question. Military training could develop skills such as discipline or leadership. It could also have provided familiarity with logistics. Descriptions of the strengths of Grant's leadership and of the management of the modern firm are similar.[2] Although military service on average has a negative causal effect on earnings (Angrist 1990), Benmelech and Frydman (2009) find that military service has a causal effect on managerial decisions and firm outcomes. Even if military training has no effect on later outcomes, if military leaders are the most able they will become the civilian leaders.

The most able (those who become officers) should sort to where their abilities have the

greatest pay-offs. Thus they will be in larger cities, which may have fostered the division of labor, and in higher status occupations after the war. Lee (2007) finds that former non-commissioned and commissioned officers were more likely to move upward in status to a white collar occupation by 1880 than privates, but did not look at where men migrated. Moving to a large city may have opened up opportunities even for men who had to start in lower status occupations. If the more able leaders are also generalists (Lazear 2010), then the officers who had different types of duties during the war will be more likely to be in larger cities than those who had only type of duty.

3 Econometric Framework

I examine whether officers were more able by looking at the predictors of time in months from muster until first promotion to commissioned officer, sergeant, and corporal. That is, I estimate a Weibull hazard model of the form

$$h(t) = h_0(t) \exp(\beta_x(X) \tag{1}$$

where $h_0(t)$ is the baseline hazard and X is a vector of characteristics including height, personal property ownership in 1860, literacy in 1860, marital status in 1860, nativity, occupation at enlistment (professional or proprietor, artisan, laborer, and unknown, with farmer as the omitted category), dummies for enlistment year, age at muster, volunteer status, the logarithm of population in city of enlistment, and whether the regiment was in the past under fire, a measure of promotion possibilities.

I estimate the effectiveness of leading from the front by estimating OLS regressions of

the form

$$\text{Company Desertion Rate} \quad = \quad \beta_r(\frac{\text{No of officers killed}+.01}{\text{No of men killed }+.01}) +$$
$$\beta_d(\text{Company Death Rate in Battle}) +$$
$$\beta_o(\text{Company Characteristics}) + u \qquad (2)$$

where each observation is a company, the ratio of commissioned officers to enlisted men

killed in battle is on the regiment level, and company characteristics include the fraction

of the company who were volunteers, the coefficient of variation of age for the company,

company occupational fragmentation, birth place fragmentation, and the mean 1860 per-

cent vote for Lincoln in the county of enlistment.[3]

I examine the effects of having been an officer on city of residence in both 1880 and

1900 by estimating probit equations for each year of the form

$$\Pr(C = 1) \quad = \quad \Phi(\beta_c\text{Corporal} + \beta_s\text{Sergeant} + \beta_o(\text{Commissioned Officer}) + \beta_a\text{X}) \text{ (3)}$$
$$\Pr(C = 1) \quad = \quad \Phi(\beta_{so}(\text{Sergeant or Commissioned Officer}) + \beta_x\text{X}) \qquad (4)$$

and ordered probit equations of the form

$$\Pr(CS = i) \quad = \quad \Pr(\kappa_{i-1} < \beta_{so}(\text{Sergeant or Commissioned Officer}) + \beta_x\text{X} < \kappa_i) \text{ (5)}$$

where C is equal to one if the veteran lived in a city of at least 25,000 people in 1880

or 1900, CS is a categorical variable with city size categories of 25,0000 or more, 2500-

24,999, and less than 2500 or unincorporated in 1900, and κ is the cut point. (I combine

sergeants with commissioned officers in a single category because, as I will later show,

there was no statistically significant difference between them in later outcomes.) X is a

vector of socioeconomic and demographic characteristics, including height at enlistment, personal property ownership in 1860, literacy in 1860, marital status in 1860, nativity, occupation at enlistment (professional or proprietor, artisan, laborer, and unknown, with farmer as the omitted category), dummies for enlistment year, age at muster, volunteer status, dummies for population size in city of enlistment, and dummies for 1880 occupation in the 1900 specification. I include 1880 occupation in the 1900 regression because some occupations, such as farmer, are not city occupations and to test whether controlling for occupation leaders are more likely to move to larger cities. If officers are the most able, whether innately or because of what they have learned on the job, they should move to a larger city. My estimated coefficients on rank may in part measure unobserved human and community social capital and thus over-estimate the effects of leadership skills. Although I can control for literacy, property ownership, and occupation, these may be poor measures of human and social capital for the young.

I similarly measure the effects of having been an officer on later life socioeconomic outcomes by estimating probit equations of the form

$$\Pr(S = 1) = \Phi(\beta_c\text{Corporal} + \beta_s\text{Sergeant} + \beta_o(\text{Commissioned Officer}) + \beta_a\text{X}) \quad (6)$$

$$\Pr(S = 1) = \Phi(\beta_{so}(\text{Sergeant or Commissioned Officer}) + \beta_x\text{X}) \quad (7)$$

where S is variously an indicator of whether the veteran was a professional or proprietor circa 1900, a home owner in 1900, and a professional or proprietor in 1880.

I can obtain suggestive evidence on whether officer effects are due to the selection of who became an officer or the treatment effects of being an officer by classifying the combined category of sergeants and commissioned officers into those who would have been promoted before the end of the war with no deaths of commanding officers and those who

were promoted because of deaths of commanding officers. My classification is based on predictions obtained from Equation 1. Men who would have been promoted even without regimental casualties were arguably the born leaders whereas those who were promoted only with regimental with regimental casualties either learned to be leaders or had to prove their worth with wartime heroics. I then estimate probit equations of the form

$$\Pr(V = 1) = \Phi(\beta_{so1}(\text{Sergeant or Commissioned Officer, Promoted with deaths}) + (8)$$

$$\beta_{so2}(\text{Sergeant or Commissioned Officer, Promoted without deaths}) + \beta_x \mathbf{X})$$

where V is variously an indicator of whether the veteran was in a city of at least 25,000 in 1880 or 1900 and whether the veteran was a professional or proprietor in 1880 or circa 1900. If $\beta_{so2} > \beta_{so1}$ then leaders are born. If $\beta_{s01} = \beta_{s02}$ then leaders are created.

I also examine whether men who had been sergeants or commissioned officers and had a greater number of duties were more likely to be in a city of 25,000 or more in 1880 or 1900 compared to men with fewer duties. Men with more tasks are arguably greater generalists. I estimate probit equations of the form

$$\Pr(C = 1) = \Phi(\beta_{so1}(\text{Sergeant or Commissioned Officer, one task}) + \quad (9)$$

$$\beta_{so2}(\text{Sergeant or Commissioned Officer, more than one task}) + \beta_x \mathbf{X})$$

$$\Pr(C = 1) = \Phi(\beta_{so1}(\text{Sergeant or Commissioned Officer, one task}) + \quad (10)$$

$$\beta_{so2}(\text{Sergeant or Commissioned Officer, two tasks}) +$$

$$\beta_{so3}(\text{Sergeant or Commissioned Officer, more than two tasks}) + \beta_x \mathbf{X})$$

where C is an indicator equal to one if population in the city of residence was more than 25,000. Because pay was determined by rank and not by the number of tasks, if $\beta_{s02} > \beta_{s01}$

I can rule out the hypothesis that officers moved to cities and became professionals and proprietors because their army pay provided them the means to do so.

4   Data

My sample is based on the army records of roughly 35,000 white men in 303 volunteer infantry Union Army regiment.[4] These records provide basic socioeconomic and demographic information at enlistment and record muster-in and muster-out information, promotions and demotions, furloughs, AWOLs, desertions, captures, wounds, illnesses, and death. Information on the 1860 population of incorporated place of enlistment was added. Military records were collected for all enlisted men within one of the randomly chosen companies. The commissioned officers in the sample are therefore predominately those who rose from the ranks. I added information whether the regiment was under fire in a specific month from the regimental histories collected as part of this project.

After the military records were entered into the database, pension records, including detailed physical examinations, were collected. The pension records provide information on occupation, names of family members, and death. The information in the pension records and in the army records is then used to link recruits to the 1850, 1860, 1900, and 1910 censuses. Linkage to the 1860 census indicates that the sample is representative not just of the Union Army but also of the northern population of military age in terms of literacy and wealth. I will use information from the 1860 census on personal property ownership, literacy, and marital status and from the 1900 census on place of residence and occupation. I used the published tables from the 1900 census to obtain information on population of the incorporated place. I also use the linkage to the 1880 census done by Costa and Kahn (2007). This linkage only uses information in the military service records.[5] I added

population on city of residence from the published tables of the 1880 census.

I restrict my analyses to men with complete wartime information on desertion, death, and discharge, leaving me with 34,941 men. When examining the effects of rank on mortality I restrict the sample to the 27,545 men with complete date information on all rank changes and who were not commissioned officers when they joined the company. When I examine men in 1880 and 1900, I am using 5,464 and 10,756 observations, respectively.[6]

My analysis of the effectiveness of leading from the front uses the 300 companies for whom I have information on the regimental battlefield mortality rate of officers and enlistment men from Dyer's *A Compendium of the War of the Rebellion*. I calculated company desertion rates, the fraction of the company dead from wounds, the fraction of the company dead of disease, the fraction of the company who were volunteers, the coefficient of variation of age for the company, company occupational fragmentation, company birth place fragmentation, and the mean 1860 percent vote for Lincoln in the county of enlistment using individual level data on the 34,941 men.

Table 1 shows variable means for all 34,941 men (or those linked to the censuses) by highest rank achieved. The literate, the native-born, professionals or proprietors and artisans, volunteers, and those who volunteered earlier are more likely to become officers. Those who became commissioned officers are less likely to have died during the war but this may simply be because only those who survived longer were at risk of being commissioned. After the war, officers were more likely to be professional or proprietors and were living in larger cities.

5   Results

5.1   Creating Leaders

Table 2 shows that the more able were more likely to become officers, i.e. men who were more literate and men who were either professionals or proprietors or artisans. Professionals and proprietors were more than 8 and half times as likely as farmers to become commissioned officers and almost 5 times as likely to become sergeants. Artisans were roughly 2 and half times as likely as farmers to become either commissioned officers or sergeants. The tall were more likely to become officers, as were the native-born. The native-born were almost twice as likely as non-natives to become commissioned officers. Size of city of enlistment did not matter. Volunteer status predicted becoming a corporal but was not a statistically significant predictor of being promoted to either sergeant or officer. Controlling for year of enlistment and other characteristics of men at enlistment, having the regiment be under fire in the past was a statistically significant predictor of promotion. Being under fire in the past month predicted promotion to sergeant and corporal and being under fire two months ago predicted promotion to commissioned officer, probably because of the time it took to obtain a commission.

Promotion to either commissioned or non-commissioned officer lowered the overall odds of death relative to a private, controlling for height, personal property ownership in 1860, literacy in 1860, marital status in 1860, nativity, occupation at enlistment, year of enlistment, age at muster, volunteer status, and population in city of enlistment.[7] Relative to a private, the odds of death from a hazard model were 0.888 ($\hat{\sigma}$=0.061) for a corporal, 0.824 ($\hat{\sigma}$=0.070) for a sergeant, and 0.181 ($\hat{\sigma}$=0.057) for a commissioned officer. Promotion to corporal or sergeant lowered the odds of death relative to a private from disease but raised the odds of death from wounds to 1.216 ($\hat{\sigma}$=0.122) for a corporal and to 1.347 ($\hat{\sigma}$=0.149)

for a sergeant. The risk of death for a commissioned officer relative to a private was lower for both causes of death. The estimated duration dependence parameter for the weibull used in the estimation, p, was 0.924 ($\hat{\sigma}$=.018) for death from disease and 1.191 ($\hat{\sigma}$=0.045) for death in battle, implying that men's risk of death from disease fell with their time in the army (perhaps as they developed immunities) but that their risk of death from wounds rose.

Conditional on being a sergeant or a commissioned officer, the only individual characteristic that predicted survivorship was occupation. Sergeants and commissioned officers who had been laborers at enlistment were less likely to die than farmers or artisans but were not statistically distinguishable from professionals and proprietors. It is certainly possible that both capable and incapable leaders died in the war – the capable who led by example and the incapable who put themselves in needless danger. If the least capable on unobservables survived, I will underestimate the effect of being a leader on later outcomes. In contrast, if the most capable survived, I will overestimate.

5.2   Leader Effectiveness

Although on average commissioned officers did not imperil themselves in battle, when they did, it was an effective strategy in creating a cohesive fighting unit. At the regiment level, the mean ratio of officers to enlisted men killed was 0.169 with a standard deviation of 0.333. Company desertion rates, which averaged 11 percent, were lower for companies in which the regimental battlefield mortality of commissioned officers relative to enlisted men was higher (see Table 3), controlling for the fraction of men in the company dying of wounds and of disease. The results persist when I control for proxies for commitment to the cause such as the strength of the vote for Lincoln in the county of enlistment or volunteer status and for proxies for cohesiveness such as the coefficient of variation of age, occupational fragmentation, and birth place fragmentation (see the last two columns).[8] A

standard deviation increase in the mean ratio of officers to enlisted men killed would have lowered desertion rates by 0.014. In contrast, desertion rates would have fallen by 0.008 with a standard deviation increase in the fraction of the company who were volunteers, by 0.012 with a standard deviation decrease in birthplace fragmentation, by 0.033 with a standard deviation increase in the percent of the county voting for Lincoln, and by 0.044 with a standard deviation decrease in occupational fragmentation. I find no evidence of non-linearities in the effect of the ratio of officers to enlisted men killed on desertion rates (results not shown). When I control for mean age, the coefficient is insignificant and does not affect the coefficients on the other variables (results not shown). The ratio of deaths from disease of officers relative to enlisted men had no effect on desertion rates (see the second column of Table 3), either because sick men could not desert or because the connection between officers' better food and quarters and their lower risk of death from disease was not well known.

5.3   Are Leaders in Larger Cities?

In 1880 former sergeants and commissioned officers were more likely to be in cities of 25,000 or more relative to privates (see Table 4), controlling for characteristics at enlistment, including enlistment occupation and size of city of enlistment. A former sergeant was 1.7 times as likely as a former private to be in a city of 25,000 or more while a former commissioned officer was 2.8 times as likely. The difference between corporals and sergeants was statistically significant at the 7 percent level and the difference between corporals and officers was statistically significant at less than the 1 percent level. There was no statistically significant difference between sergeants and commissioned officers. When I look at the combined category of former sergeant or commissioned officer, these men were twice as likely to be in a city of 25,000 or more. When I control for occupation in

1880, these men were still 1.9 times as likely to be in a city of 25,000 or more. If I include regiment fixed effects, I lose half of the sample, but obtain similar results with derivatives of -0.003 ($\hat{\sigma}$=0.016), 0.034 ($\hat{\sigma}$=0.018), and 0.120 ($\hat{\sigma}$=0.044) of the probit coefficients on corporal, sergeant, and officer, respectively. When I restrict the sample men who did not have severe wounds (about 70 percent of the sample), the coefficient on the combined category of sergeant or commissioned officer falls from 0.032 to 0.020 ($\hat{\sigma}$=0.010). The political connections of officers are not a likely explanation for my results. When I dropped all men who were in identifiable government jobs (less than 1 percent of the sample), the derivatives of the probit coefficient in Table 4 remain unchanged at 0.001 ($\hat{\sigma}$=0.009), 0.023 ($\hat{\sigma}$=0.010), and 0.060 ($\hat{\sigma}$=0.023) for corporals, sergeants, and officers, respectively.

Former sergeants and commissioned officers were not just more likely than former privates to be in large cities, they were also more likely to be in intermediate size cities. They were twice as likely as former privates to be in cities of 25,000 or more and 1.2 to 1.7 times as likely to be in cities of 2,500 to 24,999 (see Table 4).

Former sergeants and commissioned officers were more likely to have moved across counties between 1860 and 1880 (results not shown). The fraction of county movers was 0.59 and being a former sergeant raised the probability of a move relative to a private by 0.055 ($\hat{\sigma}$=0.031). Being a former commissioned officer raised the probability of a move by 0.102 ($\hat{\sigma}$= 0.052). Conditional on being a county mover, there was not a statistically significant relationship between distance moved and wartime rank and the sign of the co-efficient on former commissioned officer implies that former officers were less likely to move long distances. Former sergeants were statistically significantly more likely to have moved across states but not former commissioned officers. The results are consistent with a move to large cities rather than with a westward migration.

Examining size of city of residence and wartime rank in 1900 yields similar but slightly

attenuated results (see Table 5), controlling for enlistment characteristics and 1880 occu-
pation. Corporals, sergeants, and commissioned officers were more likely to be in a city
of 25,000 or more relative to privates. Although the magnitude of the effect is bigger for
commissioned officers, there was no statistical difference between corporals, sergeants, and
commissioned officers. For the combined category of former sergeant or commissioned of-
ficer, these men were 1.3 times as likely to be in city of 25,000 or more relative to privates.
They were 1.2 times as likely to be in a city of 2,500 to 24,999. When I omitted 1880
occupation as a control I obtained very similar results. For example, the derivatives on cor-
poral, sergeant, and officers were 0.023 ($\hat{\sigma}$=0.011), 0.026 ($\hat{\sigma}$= 0.012), and 0.056 ($\hat{\sigma}$=0.024),
respectively.

Former sergeants and commissioned officers were more likely to be professionals or
proprietors in 1880 and 1900 and former corporals were also more likely to be professionals
or proprietors circa 1900 (see Table 6). Men in the combined category of former sergeant
or commissioned officer were 1.7 to 1.8 times as likely to be professionals or proprietors
relative to privates.

In both 1880 and 1900 having been a sergeant or commissioned officer raised a vet-
eran's probability of 1) living in a city of 2,500 or more and being a professional or pro-
prietor; 2) living in city of 2,500 or more and not being a professional or proprietor; and,
3) not living in city of 2,500 or more and being a professional or proprietor (results not
shown). Relative to the mean probability of living in a city of 2,500 or more and being a
professional or proprietor, having been a former sergeant or commissioned officer roughly
doubled the joint probability of living in a city of 2,500 or more and being a professional
or proprietor.[9]

Cities may have provided training opportunities for the able. (Because of sorting on
ability, a random veteran would not necessarily benefit from being in a city.) Veterans who

were in a city of 2,500 or more in 1880 and were not professionals or proprietors in 1880 were more likely to be professionals and proprietors in 1900 (see Table 7). Conditional on being a private or corporal, the probability in a probit regression of being a professional or a proprietor in 1900 rose by 0.051 if the veteran was in a city of at least 2,500 and was not a professional or proprietor in 1880 compared to the probability for a veteran of not being in a city of at least 2,500 and not being a professional or proprietor in 1880. Conditional on being a sergeant or an officer, the respective probability was 0.127.

The movement of officers to large cities did not lead former privates and corporals to follow them (results not shown). The 298 former sergeants or commissioned officers in cities or boroughs in 1900 were more likely to be in city of 25,000 or more if there was a fellow officers in that same city (the derivative of the probit coefficient was 0.366 with a standard error of 0.091), but the number of former privates or corporals did not predict former sergeants and officers being in a large city. In contrast, the 1661 former privates or corporals in cities in 1900 were more likely to be in city of 25,000+ if there was an enlisted man in that city (the derivative on the probit coefficient was 0.327 with a standard error of 0.039) but not if there was a former sergeant or officer in that city.

5.4   Are Leaders Born or Created?

I obtain mixed evidence on whether leaders are born or created (see Table 8). I classified men into those who would have been promoted to sergeant or commissioned officer prior to the end of the war with no casualties and into those who were promoted only with casualties (based on a regression similar to those in Table 2). The latter group constitutes the majority of promotions – 587 out of 767 in 1880. I then estimated probit regressions of being in a city of 25,000 or more and of being a professional or proprietor in 1880 and in 1900. Regardless of why they were promoted, sergeants and commissioned officers

were statistically, significantly more likely than privates and corporals to be in a city of at least 25,000 and to be professionals or proprietors in either 1880 or 1900. Although a comparison of the point estimates of the on promotion types suggests leaders entered the army as leaders, the derivatives are only statistically significantly different from each other when I look at who was in a city of 25,000 or more in 1880.

I also used a regression similar to those in Table 2 to identify men who missed being promoted because casualty rates did not reach the 90th percentile. I could identify 27 such men in 1880 and 43 such men in 1900. When I compared the city size choice of these men to men who had been promoted using a probit similar to Equation 4 I obtained derivatives on the men who had missed promotion and on the combined category of sergeant and officer of -0.013 ($\hat{\sigma}$=0.021) and 0.033 ($\hat{\sigma}$=0.009) in 1880 and -0.076 ($\hat{\sigma}$=0.024) and 0.033 ($\hat{\sigma}$=0.011) in 1900. Although the derivatives are statistically significantly different from each other only in 1900, one potential explanation for the negative sign on men who missed promotion is that there were unobservable characteristics such that these men were not leadership material.

On the whole I interpret the available evidence as suggesting that, at least in the long-run, leaders are created. However, because other hypotheses could explain the findings, the results are suggestive only. I therefore tentatively explain my post-war mobility results as largely due to training. Although wartime promotion might reveal information on who was a leader, my findings on leaders as generalists (see below) suggest that it was not just promotion per se that mattered but also the number of tasks performed.

5.5   Leaders as Generalists

There is suggestive evidence sergeants and officers with more than strict military tasks while in the army were more likely to be in a city of 25,000 or more in 1880 (see Table 9),

consistent with Lazear's (2010) theory of leaders as generalists. I classified different tasks as being a quarter-master, being on recruiting duty, being a clerk, being a nurse, etc. if a veteran was ever in a front-line position. I do not consider being on guard duty a different type of task nor do I consider a promotion to be a different type of task. The point estimates for both 1880 and 1900 imply that while any sergeant or officer was more likely to be in a large city compared to privates and corporals, sergeants and officers with more than one type of duty were more likely to be in a large city than those with only one type of duty. However, the difference in the point estimates on number of duties was statistically significant only for 1880. When I examined the separate categories of corporals, sergeants, and officers, I found that relative to privates sergeants with only one type of task had only a 0.014 ($\hat{\sigma}$=0.012) greater probability of being in a large city in 1880, but those with more than one task had a 0.079 ($\hat{\sigma}$=0.034) greater probability. Commissioned officers with only one type of task had a 0.056 ($\hat{\sigma}$=0.037) greater probability of being in a large city compared to one of 0.156 ($\hat{\sigma}$=0.077) for officers with more than one type of task. Having more than one type of task may proxy not for being a generalist but having for the chance to acquire skills that were more transferable to the private sector (Lee 2007). When I classified the combined category of sergeants or commissioned officers as having one, two, and three or more tasks, I found suggestive but not statistically significant evidence of decreasing returns in 1880 and of increasing returns in 1900 (see Table 9).

My results rule out greater army pay rather than leadership skills leading men to move to cities in 1880. Although I cannot rule this out in 1900, in the long-run the difference in the number of tasks performed during the war may have mattered less than civilian experience.

6 Conclusion

The Civil War provides researchers a unique opportunity to identify wartime leaders. By observing both leaders and followers during the war and forty years after it, I established that the most able became wartime leaders, that leading by example from the front was an effective strategy in reducing desertion rates, and that leaders later migrated to the larger cities because this is where their superior skills would have had the highest pay-offs. Although my findings on whether leaders are born or created are mixed, on the whole my results suggest that leaders are created. My findings support theories of leadership based on personnel economics such as those of Lazear (2010) in a completely different context and with a much longer term follow-up than is usual with modern firm data.

My findings also have implications for the growth of US cities. The literature on internal migration has emphasized the westward movement, but at the same time that the population was moving westward the share of the urban population (those living in a city of at least 2500) rose from 20 to 40 percent between 1860 and 1900. Cities were magnets for the most able (the leaders). They also provided training opportunities for both leaders and followers: men might start in a low social status occupation in a city but then move to a higher status occupation.

Appendix

Civil War regiments and companies were organized as follows:

REGIMENT (=10 Companies)

Commander: Colonel

Staff positions:

Lieutenant Colonel, Major, Adjutant (1st Lieutenant), Surgeon (Major)

Assistant Surgeon (Captain), Quartermaster (Lieutenant), Commissary (Lieutenant)

Sergeant-Major, Quartermaster Sergeant

COMPANY (=100 men = 2 platoons = 4 sections = 8 squads)

Commander: Captain

1st Lieutenant, commanded one platoon if company divided into platoons (the captain ran

the other)

2nd Lieutenant

1st Sergeant, "ran" whole company

4 Sergeants, one for each section

8 Corporals, one for each squad

Privates

2 musicians

Non-commissioned officers are corporals and sergeants. Ranks of lieutenant and higher are

commissioned officers.

Source: http://www.angelfire.com/wv/wasec5/formations.html

Notes

[1]The original source is unknown.

[2]Grant used the telegraph "to collect intelligence, summon reinforcements, rapidly re-dispose [their] forces, and co-ordinate the movement of widely separated formations." "He valued objective information highly and collected it from many sources ... Rivers and railroads were the means by which Grant brought his armies to the battlefield, spies, scouts and telegraph the media through which he informed himself of the enemy's own movements" (Keegan, 1987:210-221). Grant was not able to transfer his skills to the private sector and was a notoriously bad business man.

[3]To estimate birth place I calculated, by company, the fraction of individuals born in the US in New England, in the Middle Atlantic, in the East North Central, in the West North Central, the Border states, the south, and the west and born abroad in Germany, Ireland, Canada, Great Britain, Scandinavia, northwestern Europe (France, Belgium, Luxembourg, the Netherlands), other areas of Europe, and other areas of the world. The birthplace fragmentation index, f_i, is then

$$f_i = 1 - \sum_k s_{ki}^2 \,,$$

where k represents the categories and where s_{ki} is the share of men of born in place k in company i. To estimate occupational fragmentation I calculated, by company, the fraction of individuals who were farmers, higher class professionals and proprietors, lower class

professionals and proprietors, artisans, higher class laborers, lower class laborers, and un-

known. The occupational fragmentation index is then calculated similarly to the birthplace

fragmentation index.

[4]The data were collected as part of the NIA funded project, *Early Indicators of Later*

Work Levels, Disease and Death (P01AG10120), Robert Fogel, PI. The data are available

at http://www.cpe.uchicago.edu.

[5]For a discussion of linkage rates see Costa and Kahn (2007).

[6]More men are linked to the 1900 census than to the 1880 census because using the

pension information leads to a better match.

[7]Estimates are from a Weibull hazard models of months until death from muster

$$h(t) \quad = \quad h_0(t) \exp(\beta_c(\text{Corporal}) + \beta_s(\text{Sergeant}) + \beta_o(\text{Commissioned Officer}) + \beta_x \text{X})$$

where $h_0(t)$ is the baseline hazard. Men who desert, become POWs, or are discharged are

treated as censored. I examine both time until death from all causes and time until death

from disease and wounds. My regressions for wounds also control for whether or not an

officer position was a front-line position (e.g. a quarter-master was not).

[8]See Costa and Kahn (2003) for the effects of company characteristics on desertion

rates and details on how the fragmentation indices were calculated.

[9] Results are from multinomial logit models for both 1880 and 1900 in which my cat-

egories are 1) in a city of 2,500 or more and a professional or proprietor; 2) in a city of

2,500 and not a professional or proprietor; 3) not in a city of 2,500 and a professional or

proprietor; and, 4) not in city of 2,500 or more and not a professional or proprietor. That

is, I estimate

$$\Pr(\text{Category i}) = \beta_{so}(\text{Sergeant or Commissioned Officer}) + \beta_x X$$

where X is in an indicator of a vector of pre-enlistment and enlistment demographic and socioeconomic characteristics.

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Table 1: Characteristics of Men by Highest Rank Achieved

	Private or Support	Corporal	Sergeant	Commissioned Officer
Dummy=1 if has personal property in 1860	0.699	0.698	0.676	0.700
Dummy=1 if married in 1860	0.331	0.297	0.314	0.399
Dummy=1 if illiterate	0.045	0.016	0.010	0.012
Dummy=1 if Native-born	0.733	0.796	0.800	0.846
Irish	0.092	0.066	0.077	0.041
German	0.079	0.058	0.049	0.054
British	0.039	0.041	0.038	0.032
Other	0.058	0.039	0.036	0.027
Age at muster	25.784	25.164	25.837	26.459
Height in inches	67.435	68.075	68.456	68.554
Population in 1860 in enlistment place	64,404.030	53,318.420	76,581.600	64,852.090
Dummy=1 if farmer	0.516	0.520	0.428	0.350
Professional or proprietor	0.189	0.226	0.275	0.257
Artisan	0.064	0.085	0.122	0.247
Laborer	0.226	0.161	0.164	0.103
Unknown	0.006	0.008	0.011	0.043
Dummy=1 if mustered in 1861	0.189	0.270	0.324	0.350
1862	0.324	0.426	0.420	0.466
1863	0.073	0.049	0.048	0.043
1864	0.280	0.174	0.145	0.095
1865	0.134	0.080	0.063	0.046
Dummy=1 if volunteer	0.894	0.962	0.976	0.985
Dummy=1 if died in the war	0.140	0.129	0.120	0.056
Population in 1880 city of residence	20,229.520	20,738.400	37,602.180	51,787.690
Population in 1900 city of residence	96,883.030	94,386.460	166,247.600	176,386.800
Dummy=1 if farmer in 1880	0.432	0.434	0.381	0.220
Professional or proprietor	0.123	0.117	0.208	0.336
Artisan	0.180	0.220	0.206	0.253
Laborer	0.237	0.197	0.182	0.154
Dummy=1 if farmer c. 1900	0.740	0.681	0.592	0.469
Professional or proprietor	0.261	0.281	0.359	0.566
Artisan	0.417	0.398	0.447	0.389
Laborer	0.514	0.369	0.357	0.235
Dummy=1 if home owner in 1900	0.601	0.667	0.607	0.636
Obs	28,255	3,138	2,573	975

Table 2: Odds Ratio of Probability of Promotion

	Time (in Months) Until		
	Commissioned Officer	Sergeant	Corporal
Regimental casualties current month	1.002	1.001	0.998
	(0.008)	(0.004)	(0.005)
Regimental casualties one month ago	1.005	1.014‡	1.014‡
	(0.006)	(0.003)	(0.003)
Regimental casualties two months ago	1.012‡	0.0984*	0.988
	(0.003)	(0.008)	(0.009)
Regimental casualties three months ago	0.989		
	(0.014)		
Age at muster	1.029†	0.992	0.985*
	(0.012)	(0.008)	(0.008)
Height in inches	1.124‡	1.153‡	1.066‡
	(0.035)	(0.027)	(0.024)
Dummy=1 if has personal property in 1860	1.169	0.876	0.751*
	(0.356)	(0.155)	(0.115)
Dummy=1 if illiterate	0.000‡	0.318*	0.474
	(0.000)	(0.208)	(0.224)
Dummy=1 if Native-born	1.806*	1.098	1.357*
	(0.585)	(0.192)	(0.224)
Dummy=1 if volunteer	1.253	1.188	2.268*
	(0.684)	(0.631)	(1.117)
Logarithm(Population in City of Enlistment)	0.944	0.948	0.981
	(0.060)	(0.040)	(0.038)
Dummy=1 if at enlistment farmer			
Professional or proprietor	8.671‡	4.951‡	1.123
	(2.164)	(0.945)	(0.265)
Artisan	2.344‡	2.512‡	1.774‡
	(0.571)	(0.415)	(0.240)
Laborer	0.845	1.725‡	1.240
	(0.317)	(0.332)	(0.204)
Number of men	27,545	26,879	25,837
Number of promotions	122	295	446

* $p < 0.10$, † $p < 0.05$, ‡ $p < 0.01$

The sample is restricted to men with complete information on all rank changes and dates of rank changes. Standard errors are in parentheses and are clustered at the company level. Additional control variables include enlistment year dummies, a dummy for volunteer status, a dummy for unknown occupation, and a dummy indicating linkage to the 1860 census. See Equation 1 in the text.

Table 3: Effect of Leading from the Front on Company Desertion Rates

		Dependent Variable:			
	Mean	Company Desertion Rate			
No of officers killed+.01 / No of men killed +.01 in regiment	0.169	-0.044†		-0.032*	-0.042†
	(0.332)	(0.020)		(0.019)	(0.019)
Fraction company dying of wounds	0.046	0.287*	0.394†	0.139	0.132
	(0.041)	(0.161)	(0.155)	(0.150)	(0.144)
Fraction company dying of disease	0.091	-0.256‡	-0.204†	0.026	0.008
	(0.008)	(0.096)	(0.095)	(0.096)	(0.094)
Fraction company volunteers	0.918			-0.066*	-0.046
	(0.173)			(0.034)	(0.033)
Company coefficient of variation of age	3.583			-0.016	-0.024†
	(0.453)			(0.012)	(0.012)
Company occupational fragmentation	0.541			0.230‡	0.244‡
	(0.184)			(0.034)	(0.033)
Company birth place fragmentation	0.632			0.067‡	0.053†
	(0.228)			(0.025)	(0.024)
No of officers died disease +.01 / No of men died disease +.01 in regiment	0.017		0.051		
	(0.059)		(0.106)		
1860 vote (%) for Lincoln in enlistment county	48.444				-0.002‡
	(16.341)				(0.000)
Constant		0.129‡	0.111‡	0.061	0.169‡
		(0.014)	(0.012)	(0.062)	(0.063)
Observations		300	300	300	291
R-squared		0.044	0.030	0.231	0.304

* $p < 0.10$, † $p < 0.05$, ‡ $p < 0.01$
Each observation is a company. See Equation 2 in the text. Standard errors are in parentheses and are clustered at the company level.

Table 4: Wartime Rank (Relative to Private) and Size of City of Residence in 1880

	Probit		Ordered Probit Odds Ratios		
	City of 25,000+		City Population		
	$\frac{\partial P}{\partial X}$	Odds Ratio	25000+	2500-24999	Diff-erence
1. Probit					
Corporal	0.002	1.046			
	(0.009)	(0.245)			
Sergeant	0.023‡	1.663‡			
	(0.010)	(0.312)			
Commissioned Officer	0.063‡	2.824‡			
	(0.024)	(0.747)			
2. Probit					
Sergeant or Commissioned Officer	0.032‡	1.952‡			
	(0.009)	(0.303)			
With Occupation Category Controls					
Sergeant or Commissioned Officer	0.019‡	1.911‡			
	(0.006)	(0.360)			
3. Ordered Probit					
Sergeant or Commissioned Officer			2.093‡	1.682‡	0.410‡
			(0.292)	(0.173)	(0.127)
With Occupation Category Controls					
Sergeant or Commissioned Officer			2.127‡	1.216‡	0.910‡
			(0.355)	(0.411)	(0.332)

* $p < 0.10$, † $p < 0.05$, ‡ $p < 0.01$
The sample consists of the 5,464 men linked to the 1880 census. See Equations 3, 4, and 5 in the text. Standard errors are in parentheses and are clustered at the company level. The specifications control for height at enlistment, dummies for personal property ownership, literacy, and marital status in 1860, nativity dummies (Britain, Ireland, Germany, other foreign, with US as the omitted category), occupation at enlistment dummies (professional or proprietor, artisan, laborer, and unknown, with farmer as the omitted category), enlistment year dummies, age at muster, a dummy for volunteer status, a dummy for population size in city of enlistment, and a dummy indicating linkage to the 1860 census.

Table 5: Wartime Rank (Relative to Private) and Size of City of Residence in 1900

	Probit		Ordered Probit		
			Odds Ratios		
	City of 25,000+		City Population		
		Odds		2500-	Diff-
	$\frac{\partial P}{\partial X}$	Ratio	25000+	24999	erence
1. Probit					
Corporal	0.024†	1.227†			
	(0.011)	(0.107)			
Sergeant	0.025†	1.236†			
	(0.012)	(0.115)			
Commissioned Officer	0.054‡	1.508†			
	(0.024)	(0.232)			
2. Probit					
Sergeant or Commissioned Officer	0.031‡	1.286‡			
	(0.011)	0.106)			
3. Ordered Probit					
Sergeant or Commissioned Officer			1.335‡	1.162†	0.174‡
			(0.090)	(0.044)	(0.050)

* p < 0.10, † p < 0.05, ‡ p < 0.01
The sample consists of the 10,756 men linked to the 1900 census. See Equations 3, 4, and 5 in the text. Standard errors are in parentheses and are clustered at the company level. The specifications control for height at enlistment, dummies for personal property ownership, literacy, and marital status in 1860, nativity dummies (Britain, Ireland, Germany, other foreign, with US as the omitted category), occupation at enlistment dummies (professional or proprietor, artisan, laborer, and unknown, with farmer as the omitted category), enlistment year dummies, age at muster, a dummy for volunteer status, a dummy for population size in city of enlistment, 1880 occupation dummies (professional or proprietor, artisan, and laborer, with farmer as the omitted category), and dummies indicating linkage to the 1860 and 1880 censuses.

Table 6: Wartime Rank (Relative to Private) and Socioeconomic Status in 1900 and 1880

| | Occupation c. 1900 is Professional or Proprietor | | Owner in 1900 | | Professional or Proprietor in 1880 | |
	$\frac{\partial P}{\partial X}$	Odds Ratio	$\frac{\partial P}{\partial X}$	Odds Ratio	$\frac{\partial P}{\partial X}$	Odds Ratio
1. Probit						
Corporal	0.027‡	1.207†	0.053‡	1.090‡	-0.010	0.914
	(0.011)	(0.086)	(0.009)	(0.027)	(0.013)	(0.104)
Sergeant	0.069‡	1.542‡	0.009	1.016	0.061‡	1.530‡
	(0.013)	(0.114)	(0.015)	(0.026)	(0.016)	(0.154)
Commissioned Officer	0.169‡	2.343‡	0.075‡	1.128‡	0.117‡	2.005‡
	(0.029)	(0.267)	(0.025)	(0.044)	(0.034)	(0.318)
2. Probit						
Sergeant or Commissioned Officer	0.088‡	1.692‡	0.017	1.028	0.084‡	1.750‡
	(0.012)	(0.111)	(0.014)	(0.023)	(0.015)	(0.159)

[*] $p < 0.10$, [†] $p < 0.05$, [‡] p ¡ 0.01

The samples consist of the 5,464 men linked to the 1880 census and the 10,756 men linked to the 1900 census. See Equations 6 and 7 in the text. Standard errors are in parentheses and are clustered at the company level. The specifications control for height at enlistment, dummies for personal property ownership, literacy, and marital status in 1860, nativity dummies (Britain, Ireland, Germany, other foreign, with US as the omitted category), occupation at enlistment dummies (professional or proprietor, artisan, laborer, and unknown, with farmer as the omitted category), enlistment year dummies, age at muster, a dummy for volunteer status, a dummy for population size in city of enlistment, and a dummy indicating linkage to the 1860 census. The 1900 specifications control for 1880 occupation dummies (professional or proprietor, artisan, and laborer, with farmer as the omitted category) and a dummy indicating linkage to the 1880 census.

Table 7: City Size and Occupation Choice in 1880 and Occupational Status in 1900

Dependent Variable: Professional or Proprietor in 1900	Private or Corporal $\frac{\partial P}{\partial X}$	Sergeant or Commissioned Officer $\frac{\partial P}{\partial X}$
City of 2,500+ and professional/proprietor in 1880	0.397[‡]	0.440[‡]
	(0.062)	(0.094)
City of 2,500+ and not professional/proprietor in 1880	0.051[*]	0.127[*]
	(0.030)	(0.076)
Not city of 2,500+ and professional/proprietor in 1880	0.385[‡]	0.468[‡]
	(0.030)	(0.056)
Mean P	0.148	0.297
Observations	2,932	501
Pseudo R^2	0.119	0.127

[*] $p < 0.10$, [†] $p < 0.05$, [‡] $p < 0.01$
The sample consists of all 3,433 men linked across the 1880 and 1900 censuses. The omitted category is not in a city of 2,500+ and not a professional/proprietor in 1880. Standard errors are in parentheses and are clustered at the company level. All specifications control for age at enlistment.

Table 8: Wartime Rank of Sergeant or Commissioned Officer (Relative to Private or Corporal) by Promotion Status and Size of City of Residence and Socioeconomic Status in 1880 and 1900

	$\frac{\partial P}{\partial X}$	Odds Ratio
1. City of 25,000+ in 1880		
Promoted only with wartime casualties	0.020‡	1.579†
	(0.075)	(0.291)
Promoted without wartime casualties	0.075‡	3.194‡
	(0.024)	(0.813)
p-value, difference coefficients	0.019	
2. City of 25,000+ in 1900		
Promoted only with wartime casualties	0.021*	1.197‡
	(0.012)	(0.112)
Promoted without wartime casualties	0.055*	1.515†
	(0.022)	(0.214)
p-value, difference coefficients	0.142	
3. Professional or Proprietor in 1880		
Promoted only with wartime casualties	0.077‡	1.673‡
	(0.018)	(0.175)
Promoted without wartime casualties	0.114‡	1.993‡
	(0.034)	(0.317)
p-value, difference coefficients	0.344	
4. Professional or Proprietor in 1900		
Promoted only with wartime casualties	0.081‡	1.630‡
	(0.014)	(0.122)
Promoted without wartime casualties	0.110‡	1.852‡
	(0.022)	(0.185)
p-value, difference coefficients	0.257	

* $p < 0.10$, † $p < 0.05$, ‡ $p < 0.01$
The samples consist of the 5,464 men linked to the 1880 census and the 10,756 men linked to the 1900 census. See Equation 8 in the text. Standard errors are in parentheses and are clustered at the company level. The specifications control for height at enlistment, dummies for personal property ownership, literacy, and marital status in 1860, nativity dummies (Britain, Ireland, Germany, other foreign, with US as the omitted category), occupation at enlistment dummies (professional or proprietor, artisan, laborer, and unknown, with farmer as the omitted category), enlistment year dummies, age at muster, a dummy for volunteer status, a dummy for population size in city of enlistment, and a dummy indicating linkage to the 1860 census. The 1900 specifications control for 1880 occupation dummies (professional or proprietor, artisan, and laborer, with farmer as the omitted category) and a dummy indicating linkage to the 1880 census.

Table 9: Number of Military Duties and Size of City of Residence in 1880 and 1900

| | City of 25,000 in | |
| | 1880 | 1900 |
	$\frac{\partial P}{\partial X}$	$\frac{\partial P}{\partial X}$
1.		
Sergeant or Commissioned Officer, one duty	0.012*	0.029‡
	(0.009)	(0.012)
Sergeant or Commissioned Officer, more than one duty	0.053‡	0.049†
	(0.021)	(0.026)
p-value, difference between coefficients on number of duties	0.035	0.478
2.		
Sergeant or Commissioned Officer, one duty	0.018*	0.029‡
	(0.011)	(0.012)
Sergeant or Commissioned Officer, two duties	0.106‡	0.035
	(0.037)	(0.027)
Sergeant or Commissioned Officer, three or more duties	0.062	0.103*
	(0.056)	(0.072)
p-value, difference between coefficients on one duty and two duties	0.004	0.858
p-value, difference between coefficients on one duty and three or more duties	0.371	0.258
p-value, difference between coefficients on two duties and three or more duties	0.539	0.335

* p < 0.10, † p < 0.05, ‡ p < 0.01
The samples consist of the 5,464 men linked to the 1880 census and the 10,756 men linked to the 1900 census. See
Equations 9 and 10 in the text. Standard errors are in parentheses and are clustered at the company level. The specifi-
cations control for height at enlistment, dummies for personal property ownership, literacy, and marital status in 1860,
nativity dummies (Britain, Ireland, Germany, other foreign, with US as the omitted category), occupation at enlistment
dummies (professional or proprietor, artisan, laborer, and unknown, with farmer as the omitted category), enlistment
year dummies, age at muster, a dummy for volunteer status, a dummy for population size in city of enlistment, and a
dummy indicating linkage to the 1860 census.