

The General Infantry's Bill of Rights:
The varied effect of military service and veteran's benefits
on non-white and female veterans from 1945-2011

by

Zachary Scott Tausanovitch
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To my advisor, Joyce Jacobsen,

I owe my future.

To my friends and my housemates,

I owe my happiness.

To my family,

I owe everything.

Abstract

Many people have studied the G.I. bill and its educational provisions. In this thesis I take a new approach and consider six different periods to answer four important questions. Can we isolate the effects of different G.I. bills over time? How well do educational benefits serve to improve the socioeconomic outcomes of our soldiers? How do education benefits and subsidy programs affect minorities and women differently from the white male population? Why do educational benefits affect minority groups differently? I find that the decrease in relative educational attainment between veterans and nonveterans cannot be definitively accounted for by changes in the educational subsidies program for veterans, but there is some evidence to support this idea. In general I find that educational benefits increase earnings outcomes for veterans beyond that of comparable cohorts, although they mostly mitigate the negative earnings effect of military service. In addition I find that "privilege"—the advantage that accrues to white men in US society—is related to a decreased probability of using veterans' educational benefits to expand educational attainment relative to what would have occurred anyway. However, privilege also suggests a higher return to educational benefits, and increased usage of educational benefits when the benefit levels are high. Over time, my results suggest that non-whites have become less underprivileged, in part because of GI benefits, and that while the earnings divide between men and women has continued—GI benefits have helped to reduce that gap as well.

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Introduction

During WWII citizens volunteered and were drafted to serve the United States in one of the largest wars in history. The General Infantry Bill of Rights (G.I Bill) started as the government's partial reward to those soldiers for their sacrifices. Service in WWII was considered a selfless act of courage and the G.I. Bill helped to repay veterans for the time that they had lost serving overseas and for injuries that they may have sustained in the line of duty. The G.I. Bill is an extensive piece of legislation that has expired, been rewritten, reformed and amended numerous times since its conception in 1945. The benefits of the G.I. Bill have included home loans, training programs, healthcare, psychiatric care, and more. However, the focus of this thesis is to estimate how well the educational benefits provided by the G.I. Bill over the subsequent 65-year period have assisted our veterans. In particular, I am interested in how effects differ for non-white and women soldiers, as the differing demographic effects of the G.I. Bill have been less studied.

Studying the effect of educational benefits on veterans presents a unique opportunity to address a set of broader questions, namely: How effective are college subsidies in increasing college attendance and ultimately the outcomes of citizens, and do these subsidies have significantly different effects on minorities and women? The results of this paper offer insight as to where such subsidies might do the most good.

In order to do this, I exploit the fact that each period of military service provides us with a "natural" experiment with differing experimental settings. These

settings include required (draft) versus voluntary participation, as well as whether the educational benefit of the G.I. Bill was comprehensive or partial. In some more recent cases, the educational subsidies are purchasable during one's service.

This natural experiment structure has not gone unnoticed. There have been numerous studies regarding the effect of the G.I. bill on educational attainment and earnings, but there are still important areas that have been understudied. In 2007, Bowling and Segal published an article in the 6th Biennial DEOMI Research Symposium with the provocative title: "Data Limitations Affecting Analysis of Minority Military Members: Why We Don't Know As Much As We Should about the U.S. Military and its Minority Members," in which the authors outlined how serious our lack of knowledge is about non-white and female soldiers serving in the military. Several papers have discussed issues that concern specifically non-white or female soldiers, such as "Closing the Gap or Widening the Divide: The Effects of the G.I. Bill and World War II on the Educational Outcomes of Black Americans" (Turner and Bound, 2003). Papers such as this have made it clear that the effect of serving in the United States Armed Forces is different for minorities, but the studies vary in their empirical rigor and the subject is far from exhausted. In this study, I incorporate more recent cohorts of service using very recent 2011 data which allow us to study a more substantial sample of women and non-white veterans. This thesis also will help distinguish how each amendment to the educational benefits provided in the G.I. Bill has served white, minority, and women veterans, expanding upon previous studies that focused often on only one era's worth of effects.

There are many obstacles to overcome in measuring the effect of the G.I. Bill on educational assistance. Each of these periods of wartime or peacetime service is different in many other ways besides the differences in GI Bill provisions. The outcomes of our soldiers, had they not served in the military, are hard to predict due to data limitations as well as selection bias. This subject of how to deal with selection bias has been studied extensively by economists and statisticians, who provide a basis upon which to continue analysis. Their studies of biases and effects strengthen the results of this paper but do not rule out the possibility of misidentified effects in this study.

The main results of this thesis are fourfold. First, I find that there is a decrease over this time period in the difference in educational attainment of veterans and non-veterans. This decreased difference cannot be convincingly accounted for solely by the changing educational subsidies available to veterans. However, there is evidence worth exploring that suggests changes in subsidies do affect these decreases somewhat. In addition, the earnings difference between veterans and civilians decreases throughout this period, an effect that is apparently in part due to the reduction in the educational attainment gap.

Second, my findings support the argument that the net effect of service in the military is to increase earnings outcomes beyond that of comparable non-veterans but not due to the effects of serving. The effect is diminished by the negative effect on earnings of military service, but increased by the positive benefit of increased educational attainment. Some authors have argued that military service itself should provide skills that would increase earnings in the workforce through a process coined

as “bridging” (Cooney et al, 2003). My results suggest that often this aspect of bridging is not large enough to offset the opportunity cost of serving in the military. Educational benefits do increase the earnings of white males, non-white and female soldiers; however, the majority of this effect compensates the veterans for their opportunity cost and only places them at a slight advantage compared to their cohorts throughout all distinctive periods of war and peacetime service.

Third, I find that non-white veterans have a larger increase in educational attainment due to service than white veterans do. Over time, the general expected earnings outcome has increased for non-white citizens of the United States, even though they are still clearly underprivileged compared to white citizens. But as their relative privilege has apparently increased, the results have been threefold. First, the years of increased educational attainment due to military service fall; second, the earnings benefit of service falls; and third, the earnings returns to a year of education for minorities has increased. This implies that being a veteran mitigates the effects of being underprivileged, but that mitigation has changed over time.

Fourth, results for women veterans also support this theory about privilege. However, their outcomes have not increased compared to white males as clearly as non-white outcomes have. Women’s earnings stay relatively constant below male earnings. The general stability of lower privilege compared to men is consistent with their stable lower returns to college education, as well as a stable rate of increased college attendance due to service. The effect on earnings of service itself is unclear for women, who may have a different military experience than male soldiers (including perhaps acquisition of different sorts of skills while in service).

While there are significant moral reasons for the implementation of the General Infantry Bill, the G.I. Bill was also meant to keep the economy strong by easing veterans' transitions back into the work force, avoiding an influx of unemployed less-educated workers. The G.I. Bill design is also that of an economic stimulus, as a very large portion of the economy, over 15 million veterans, was offered monetary programs in order to improve their economic outcomes. The most influential provision was educational, although loan programs also gave veterans alternatives to the labor market. In WWII many people at home were working in factories to support the military overseas. If the soldiers returned home as soon as the war ended there would have been a flood of unemployed, similarly-skilled workers looking for work at the same time, which could have unbalanced the economy. The G.I. Bill offered the soldiers returning home an alternative, at the government's expense, to immediately entering the labor force, thereby decreasing the supply of labor and reducing the size of the shock to the civilian labor market. Also, by supporting veterans in going to college, the human capital of the United States could be increased, such that the economy would be more productive in the longer run. Finally, the effect of the cultural shift towards college attendance that many attribute to the G.I. Bill continues to be felt today, as much higher percentages of the population now attend college relative to before WWII.

Beyond the economic and social reasons for extending the G.I. Bill to veterans, there were also moral issues; the bill was based on notions of equality and fairness. The veterans who had served in the military during the original G.I. Bill coverage for WWII, who may have been enlisted by force, lost time in their lives to

pursue other things. It would be unfair to let colleges or jobs pass them over for younger or similarly-aged non-veterans when such a sacrifice had been made for their country. The Selective Training and Service Act ensured that any jobs that were lost due to individuals being drafted were returned to those who had them. However, this did not account for those who would have gotten jobs had they not served in the military.

With that in mind, it is of great importance to ensure the equality and fairness of the G.I. Bill by ensuring that its provisions are not unfairly biased towards a specific group of veterans, whether by cohort of service, gender, or race/ethnicity. However, it may also be of interest to show that the G.I. Bill has helped to equalize fundamental differences in society such as those related to gender and race/ethnicity. Any evidence, such as the evidence provided by this paper, that the G.I. bill has variable effects over time for specific groups is of interest as part of the larger story of how there has been a quest for racial and gender equality in this country. Nonetheless, a comprehensive approach that compares results of the G.I. Bill by service cohort and by race and gender has not previously been attempted. As pointed out by Bowling and Segal (2007), there are data limitations that inhibit our ability to study the outcomes of minority veterans and the data has only become recently available. Many of the papers cited by Bowling and Segal describe single period studies, and I believe a more comprehensive approach is necessary.

There is evidence that minorities benefit more from educational benefits and service itself than their cohorts (Cooney et al, 2003). Since military training is often more uniform across groups than other types of potentially productive training, less

privileged groups might see a relatively higher return to time invested in military training than those who may have had better opportunities had they not joined the military. If that hypothesis is true, joining the military should provide women and minorities with a higher return relative to their white male counterparts (and potentially relative to their civilian counterparts) due to the skills they would acquire through service. However, there is also evidence that military service does not put women at an advantage to their civilian counterparts (Mehay et al, 1993). But this evidence is from an older study; the more recent data analyzed in this thesis show that in periods that could not have been measured in 1993, that women actually do gain an earnings advantage from veteran status, even aside from the effect on educational attainment.

This thesis is a step towards assessing the cost-effectiveness of the G.I Bill for different groups of veterans, the conclusions of which are a possible step towards suggestions that the government alter the programs that are available. In an economic sense, if the provisions of the G.I. bill cost more than the reward that is given to veterans, then alternative policies may be more effective. For instance, a subsidy that is not restricted to education may be better for veterans and for the economy as a whole. Since my results find different propensities to take advantage of the subsidies and different returns to a year of college education for different groups, there are implications that different types of available subsidies could be more efficient than the current "one size fits all" benefits system. For instance, if non-whites do not benefit as much from education, such as during WWII, it might have been better to

have provided them with a different form of compensation for time spent in the military.

In the rest of this thesis I develop a framework for analysis based on historical information and economic literature to frame and interpret the empirical results reported herein. First, I present the provisions of the G.I. Bill as it applies to each period of service, outlining the different benefits to each cohort I also present relevant information about other social changes in the past 60 years, within and outside of the military that would affect veterans, women and non-white Americans. Second, I present a review of relevant economic literature and discuss what findings have already been established that I will be able to use to convince us that my results are consistent with previous work, as well as to help interpret results I find from periods that had not yet been studied by other researchers. Next, I present a description of the methodology and data used to run the analysis, followed by the results of that analysis. Finally, I engage the reader in a brief discussion of the implication of those results.

The General Infantry Bill: A Selective History

Before what we now call the G.I. bill was passed in 1944, the United States had less comprehensive legislation designed to take care of veterans. In 1919 Congress passed the Rehabilitation Act, which allowed for a “monthly assistance allowance” for veterans when they returned home. In 1940 legislators realized that enlistment in war would be very low and likely very unpopular if enlistees would have to sacrifice their jobs, so they passed the Selective Training and Service Act. This act gave citizens the right to enlist and have their position given back to them when they returned. In addition, if they were unfit for the jobs that they left behind by the time they got home, they would be eligible for training and rehabilitation health programs that might help them recover from their injury. A few years later, Congress decided to increase the benefits that veterans were entitled to, and passed the 1944 Veterans Act, which granted veterans preferred selection for civil service jobs, allowing veterans to find work more easily when returning home as well as providing a way for the government to directly give back to those who served their country.

Soon after the Veterans Act was passed, the most comprehensive benefits bill in history was passed when President Franklin D. Roosevelt signed the Servicemen’s Readjustment Act on June 22, 1944. This bill was also coined “the General Infantry Bill of Rights,” better known today as the G.I. Bill.

The first provision of the G.I. Bill is dedicated to hospitalization and the rights of disabled veterans to care. The bill designates \$500,000,000 to the building of

hospital facilities. The original text of the document does not discuss the after-service hospital care of veterans; however, it does allow for any veteran who has received an injury to be entitled to educational benefits regardless of the duration of service that he/she has incurred. This provision clearly helps mitigate the effects of service related injuries on educational and earnings outcomes. In addition, any enlistee under the age of 25 is immediately classified as someone who has the right to educational provisions as if they had been injured.

Chapter V, General Provisions for Loans, provides for low-interest loans to veterans “For the Purchase or Construction of Homes, Farms, and Business Property” not to exceed \$2,000 in 1940-50’s dollars. The terms of these loans were very favorable for veterans, with loose language describing that the loans would be given if “there is a reasonable likelihood that such operations will be successful”. This provision may also have increased earnings outcomes for business owners. However, since business profits and net wealth increases are not be included in my earnings analysis (due to such data not being available in my data sources), we do not see the full economic results of this provision.

In Chapter VI, there is a mandate for the United States Employment Service to create a Veterans Placement Service Board, to be responsible for helping veterans find suitable employment. In theory this helps solve asymmetrical information problems that would normally cloud the hiring process; thus it may increase veteran’s earnings outcomes. Chapter VII provides allowances for former members of the armed forces who are unemployed or underemployed. The allowance allotted is approximately seventeen 1944 dollars less per week than what they would have

earned if they had a job, depending on their qualifications. In addition, no veterans will be paid for duplicate benefits provided by their states, less the federal government subtract that amount from the amount to which the veteran is entitled by the G.I. Bill. Unemployment benefits probably did not affect educational outcomes and may have had a very small effect on earnings outcomes; thus this effect may be included in any general effect found of veteran-ness on earnings.

These benefits likely improve a veteran's job, earnings, and health outlook for the future; however, these benefits alone were likely not sufficient to give veterans any significant advantage over their non-veteran counterparts. Without the provision on education, veterans would have been at a significant socioeconomic disadvantage, as will be discussed later. Chapter IV of the Act provides for the education of veterans and thus is likely the key section of the G.I. Bill.

Under the original G.I. Bill, veteran's benefits were provided to veterans in varying degrees depending on their situation, when they started to serve, and the position they held. Any veteran who served in the military, if it was deemed that he/she "had his education or training impeded, delayed, interrupted, or interfered with" (Servicemen's Readjustment Act) would receive a year of training without any minimum service requirement. In addition, any veteran could receive an additional time of training equal to that of their time spent in service, not to exceed four years. A year of education did not mean the government would pay all of the applicable tuition. However, the government would pay up to \$500 of tuition to the school per year, as well as a \$50 a month stipend to the veteran. The stipend would even be increased to \$75 if the veteran had any dependents (Servicemen's Readjustment Act,

1944). Although there was a cap on the amount the government would pay for a year of education, this made available to veterans practically any out-of-state public school tuition, which in the 1960's averaged \$243 for tuition and \$271 for board (National Center for Education Statistics). Thus in 1945 tuition would have in general been well below the cap of \$500. Many schools' tuition, room, and board together, however, did exceed \$500. For instance, in 1945 The University of Pennsylvania charged \$420 for tuition and \$530 for room and board, as well as a \$50 book fee, for a total of \$1000 a year (Lloyd, 2003). However, average tuition in 1952 for private colleges was approximately \$426 and in-state public college's tuition was \$69 dollars on average (Hoxby, 1997). Thus, although \$500 was not enough to pay for private college as well as room and board at some institutions, it definitely made college accessible to those who desired it.

WWII ended in 1945, and any soldier who enlisted after the end of the war, was not guaranteed benefits under the Serviceman's Readjustment Act. Thus this policy affected the directly post-WWII peacetime military cohort differently.

In 1952, two years after the start of the Korean War, Congress passed the Veterans Readjustment Assistance Act, also known colloquially as the G.I. Bill. This Act was very similar to the Servicemen's Readjustment Act except for three major changes. First, veterans were eligible for one and half times their period of service, meaning they didn't have to serve for as long to accumulate significant benefits. Second, the maximum period of educational benefits was reduced to three years, unless they served four years or more. Third, it was reported to legislators by the U.S. House of Representatives' Select Committee to Investigate Educational, Training,

and Loan Guaranty Programs that colleges had overcharged the government during the 1944 G.I. Bill due to a lack of oversight. To avoid this problem from recurring, Congress decided to give money directly to the veterans, who would then pay the colleges themselves. The amounts that veterans were offered were increased to \$110 per month, \$135 if they had one dependent and \$160 if they had more than one dependent. The increase in these benefits made college even more accessible for the Korean War cohort than it was during WWII. Similar to WWII, these benefits were passed years after the start of the war and should thus have had little of a direct effect on enlistment (although the precedent set by the WWII G.I. Bill may have affected enlistment). The total cost per participant for education and training was \$13,381 inflation-adjusted 2011 dollars (Dortch, 2011).

In 1956 the Orphans Educational Assistance Act amended the G.I. Bill to provide educational assistance to children who were orphaned due to casualty or injury suffered by their parents during WWII or Korea. Later this act was extended to later periods, but in any case should have had no direct effect on educational and earnings outcomes for surviving veterans.

In 1966, after the beginning of the war in Vietnam (even though war in Vietnam was never officially declared by the United States), the Veterans Readjustment Benefits Act was passed to provide for educational benefits, home and farm loans, employment counseling and placement services for Vietnam veterans, as well as retroactively extending the benefits of this bill to any serviceman or woman who had served since 1955. Eligibility was more restricted than it was in the Korean War. The minimum time of service was extended to 180 days. Service members on

active duty were required to serve two continuous years of active duty before being eligible for the benefits in response to Department of Defense concerns that benefits for veterans would be counterproductive to retention efforts (Senate Committee on Labor and Public Welfare, 1965). Benefits were reduced to one month for each month of service with a limit of 36 months, in 1968 the benefits were then extended to one and half times a veteran's service period worth of education, and the upper limit was raised back up to 48 months, perhaps to increase enlistment. Support payments were raised to \$150 monthly. Allowances were provided by a work-study program that would pay up to \$250 for 100 hours of work in a college term. 1.4 million of the approximately 3 million post-Korea veterans took advantage of the program, and 6.8 million Vietnam veterans also took advantage of the services, for an average expense of \$9,189 inflation adjusted 2011 U.S. dollars per veteran in the program. This number is significantly less than was paid during the Korean War period, which suggests either that the benefits were not used to completion, or the program did not provide as much in benefits.

In 1974 the Veterans and Dependents Education Loan Program was established to provide additional educational support to veterans and their families. This program allowed for veterans to borrow up to \$600 annually, later increased to \$2,500 in 1977, to cover the difference between cost of college attendance and available resources. By 1978, 8,800 loans had been administered, but only 28 percent of these were paying for veterans to attend high-tuition schools. This program was viewed as a failure both in terms of overall size and in terms of payback rates. Legislation did not allow the program to offer lower rates to prevent default, and

collection procedures were hampered by technical difficulty. The IRS was not permitted to disclose address information so that some veterans could be found even when they defaulted (Ahart, 1978). The default rate was 44 percent by the end of 1977 and 65 percent by September 30, 1980 (Dortch, 2011). However, with the number of veterans being in the millions, a few thousand small loans should not be enough to affect the results of analysis on this period.

In 1976 Congress established The Post-Vietnam Era Veterans Educational Assistance Program (VEAP). This program was mainly designed to increase enlistment by making education not free, but affordable. The benefits were automatically extended to reserve service members, and the benefits had no retroactive component other than to those still in service at the time of passage. This bill required a minimum of 24 continuous months for already-enlisted men or the obligated period of active duty for those who had enlisted in a regular component of the armed forces; otherwise it required 180 days of service after 1976. An addition to this bill was that service-members, who are eligible under the previous G.I. Bills, are not given benefits under VEAP, with minimal exceptions. The most important changes to the Bill were that program participants had to sign up for the program, as well as contribute monthly deductions from their paycheck. They could not withdraw the funds from this account for 12 months even if they subsequently decided to forgo program benefits. The deductions had to be between \$25 and \$100 dollars per month. When the participant enrolled in an educational program, the government would then pay three times the deductions the soldiers had made. This added up to a maximum of

\$300 a month. These numbers vary slightly for different types of training, but as shown are accurate for college education (Dortch, 2011).

Perhaps because of the more complex nature of this program, as well as the payments that were required to participate, enrollment was relatively low. The military, in its desire to increase military enlistment of quality candidates, began to offer “kickers” in 1979. Kickers were additional payments made by the Department of Defense for the purpose of education to post-service veterans who were desirable or in certain branches of the military. The amounts varied dependent on the specific program and were eventually organized into the “Army College Fund” (Angrist, 1993).

In 1985 the Department of Defense Authorization Act established the All-Volunteer Force Educational Assistance Program as a three year pilot program which quickly became permanent. This program was designed to recruit higher-quality candidates, so it required that applicants complete high-school or its equivalent. If a soldier entered the military after 1985, he was automatically entered to pay into the program; otherwise the servicemen had to receive written authorization to enter the program. This program required a \$1,200 dollar contribution or more if soldiers were on different educational plans and wanted to transfer into this one. This bill, also known as the Montgomery G.I. Bill, had a wide array of educational payment plans. The most common was a monthly payment due to the soldier during his training of up to \$300 for up to 36 months. This amount was reduced if the soldier served less than three years, and there were ways of increasing the payments, by receiving kickers from specific branches or contributing up to \$600 more to receive up to \$5,200 in

benefits over a 36-month period. Under the Bill, reservists would also receive benefits for serving a six-year period. For a soldier without additional benefits under the Montgomery G.I. Bill, he/she would receive \$3,600 dollars a school year; this was well above the \$2,181 charge at the time for the average in-state school. However, it was below the \$4,885 for out-of-state school charges, and not nearly enough for the \$8,885 dollars on average required for a year at a private university (National Center for Education Statistics). However with kickers upon enlistment, bonuses for those with skills critical to the military, and up to \$150 a month for \$600 of contribution, a soldier could be capable of attending a higher-cost institution. The main benefit of \$300 a month was inflated yearly; the bonus money remained constant (Dortch, 2011).

Currently, most soldiers are still covered under the Montgomery G.I. Bill. As mentioned above, the amount per month has inflated, to \$1,426 dollars effective October 1st, 2010. In 2008 the Post-9/11 Veterans Education Assistance Program, known as the Post-9/11 G.I. Bill, was enacted. The main motivation of the bill is that if reservists were to be called into active duty, that they would receive the same educational benefits as full-time soldiers. The minimum required service is 90 days; however benefit payments would be issued after September 30, 2011. The amount generally paid for a soldier seeking a degree is \$17,500. This is well above the 2011 in-state public tuition of \$8,244; however it is below the out-of-state public tuition of \$20,770 and well below private non-profit college tuition, estimated at \$28,500 in 2011 (CollegeBoard.com).

Historical Influences on Veterans, Minorities and Women

The composition of veterans in any war is distinctive to the period and the circumstances of the war, WWII is no exception. WWII soldiers were either drafted or volunteered; they fought overseas in a war not started by the United States, for the most part without the knowledge that they would receive educational benefits for their service. The public was considered to be very proud of its soldiers and very supportive of them while they were fighting as well as when they came home. It is argued that due to public sentiment, citizens during WWII were proud to enlist and serve their country.

The requirements to enlist were that you be physically and mentally fit, as well as not enrolled in a pursuit that was vital to the nation. Out of approximately 6 million soldiers who were disqualified from service, 64 percent were exempted or rejected because they were physically or mentally unfit for service. 34 percent were exempted due to occupational reasons. This may create an upward bias on outcomes of soldiers in WWII. Not only is the selection process a measure of physical and mental fitness, but the sentiment of the time was that it was honorable to serve in the military (Angrist and Krueger, 1994).

It is estimated that 10 million out of 16 million total soldiers were drafted in WWII. Only approximately one in four served in action. Service was required for 18 months, and 24 additional months were required to avoid being put into the military reserves. One of the most-cited effects of WWII and the G.I. Bill is that college enrollment increased from 1.3 million in 1939 to over 2 million in 1946. The rate of college enrollment has been increasing consistently since that time (Figure 1).

Because the soldiers were not immediately enlisting due to the educational benefits (since that had not become law at the beginning of the War), nor was there a precedent at the time for educational benefits, it is likely that the sample composition is mostly independent of the benefits they would have received. For that purpose I assume that they did not enter the military with the expectation of benefits. Soldiers entering the war during WWII may not have needed the education since they were already relatively well educated (for their time), and public sentiment may have allowed soldiers to more easily find jobs and succeed outside of military service. However, significant research (as discussed later in the literature review section) implies that they actually suffer losses to income due to their time spent in the military. Since the data I am using for this project come from 1989-2011, the earnings outcomes are less informative for veterans of WWII than the other periods. Since the sample is much older, there may be a highly significant retirement and longevity selection bias.

The 1940's and 50's were also a distinctive period for women and non-white citizens. Many schools only accepted white men. Female positions in the military were limited to non-combat and low ranking positions such as nurses or secretaries. There are some exceptions; for instance there was an experimental program to relieve a shortage of pilots in 1942. 1,100 women graduated from flight school and ferried planes to military bases, tested overhauled planes and flew with targets during training exercises. The program was abandoned in 1944 and, although these women were not recognized as military soldiers until 1977, they received the Congressional Gold Medal in 2010. This is a small example of how the military's stance on

women's service has changed over the past 65 years (Stamberg, 2010). Programs such as these will not affect the outcomes of this study since so few women participated and often the women who did serve were not recognized as veterans, therefore they did not receive benefits.

In the United States during WWII, the decrease of men in the workforce allowed women to take jobs that were normally unavailable for them. And the experience that women had in these jobs may have altered their future job opportunities. This effect lasted beyond the end of WWII, and may have increased the earnings of women from the levels seen before the 1940's. This effect would likely lessen the increase in relative outcomes for women in service, since their cohorts were getting more diverse and useful work experience at home. This would cause older women from our WWII cohort to have lower earnings relative to women who began working during that time. Since my sample contains younger women from that period this effect should not be apparent in my results.

Non-white soldiers were allowed to serve in combat in WWII; however they were limited by the military system as well as at home in their ability to advance. Still facing significant racism, especially in the south where they were less able to become college educated, black soldiers were not allowed to serve on the front lines of the war until after significant losses caused the want of more soldiers. Black airmen from Tuskegee airbase only began flying planes in 1943, with their first desegregated mission in 1944. It was arguably much worse for black women, who weren't even allowed to be nurses in the military until 1944 because of protests that it would be inappropriate for black nurses to treat white soldiers (Krause, 2001). These conditions

likely affected the outcome of non-white and women veterans. They would not have received the same training that may have benefited white soldiers in the civilian job market, as well as suffering the effects of racism and sexism in the United States that would already have made it difficult to get a college education or a fair wage.

Soon after WWII, the United States declared war in Korea. The Korean War was an all-volunteer war with similar veterans' benefits to WWII. Because Korea was an all-volunteer war there is no sampling of the population done by the government. Only self-selected citizens served in the military, which reduces the selection problem for analysis from non-random sampling to self-selection. However, since the Korean War is between two considerably different draft wars, and the Korean War G.I. Bill is similar to the WWII G.I. Bill, if the results are consistent between the wars it would help convince us that the different methods of selection do not provide drastically different results.

Since the difference between Korea and WWII is only a few years, there are relatively few cultural changes between the periods, and only a few legislative ones. The G.I. Bill had been introduced in WWII, so it is possible that volunteers would expect a similar bill to be passed for Korean War veterans. Soldiers who joined the military after the Veterans Readjustment Act may have been more influenced by the potential benefits. The effect may have been reduced since college enrollment had increased after WWII more citizens who didn't serve in the military would choose to attend college. Since WWII was so recent we may also see more career military personnel who enlisted during the high enlistment periods of WWII.

Culturally it is likely that women and non-white Americans still faced similar discrimination at home in the Korean Era as they did during WWII. Meanwhile, in the Armed Forces there was a significant increase in racial equality. In December, 1951, the Chief of Staff ordered that all commands of the military desegregate. This change allows us to assume that non-white soldiers would then be able to receive the same level of training inside the military that would help them gain jobs outside the military as white soldiers. Women, however, still had a very limited presence in the military with only a few non-traditional jobs that may have increased their human capital slightly relative to what it would have been otherwise. The main difference for women relative to the earlier war period was the creation of Mobile Army Surgical Hospitals, which allowed nurses to serve much closer to the front lines of the conflict.

After the Korean War, from 1955 to 1964 there was a nine year period without any major conflict. There were also no educational benefits until the 1966 Veterans Readjustment Benefits Act, which retroactively extended the benefits given to Vietnam veterans to veterans of this period. This period is not normally included in G.I. benefits analyses. This is likely due to the difference in selection of soldiers as well as benefits differences. Selection could change because soldiers with different characteristics would enlist during wartime as opposed to during peacetime. Also the amount of training offered to peacetime soldiers may be different than to soldiers that have to serve in a war, which should make them more experienced, depending on their position, for their entrance into society. For soldiers who served earlier in the period it is less likely that they would have either waited until 1966 to get an education, or that they would be as available to start their education after 1966. Also,

since there was no period of war, there is no information for this period on how non-white soldiers were organized during military conflict. However, at that time the military had been desegregated.

Although the United States never officially declared war in Vietnam, the Vietnam War period, as per the Current Population Survey (CPS) sample used in this thesis, begins in 1964. Vietnam was a highly protested war in which there was a draft for soldiers, and G.I. benefits similar to those provided in Korea and WWII. The main difference for the benefits structure was a growing gap between the cost of in-state public universities and out of state universities, which cost 3 to 6 times more (National Center for Education Statistics)

The Vietnam draft is described in popular culture as being less well received than the WWII draft. Citizens had an incentive to avoid the draft and those with higher incomes could do so by entering college or a career that would be exempt as well as finding loopholes that lower income Americans were less able to exploit (Angrist and Krueger, 1994). This would cause a downward bias on education for Vietnam veterans due to selection. There may also be an effect of increased trauma for Vietnam veterans. Post-traumatic stress disorder and high veteran suicide rates, perhaps the result of brutal guerilla warfare in a foreign jungle, may have negatively affected the outcomes of these soldiers.

For women and non-white Americans, there were significant changes brought about by the late 60's and early 70's. The civil rights movement brought about significant changes for non-white Americans, and progressive feminist movements brought about significant change for female Americans. With the Civil

Rights Act of 1964, non-white Americans were permitted to attend the same schools as white Americans. This should have helped mitigate the problems of southern blacks who were almost unable to take advantage of their educational benefits after WWII but there was still no guarantee the transition to full educational equality would be easy (Turner and Bound, 2003). There was similar progress made for women. The Equal Pay Act of 1963 made it a criminal offence to discriminate in paying wages on the basis of sex. Although the effectiveness of this bill is debatable, the sentiment behind the bill shows a significant step forward for women's rights. In 1972, Title IX, a portion of the Education Amendments act of 1972, made it illegal to exclude women from "any education program or activity receiving federal financial assistance" (United States Code Section 20). This would allow women significantly better access to higher education, in addition, Executive Order 11375, given by Lyndon B. Johnson in 1967, banned discrimination in hiring and employment on the basis of sex for all government jobs and contracts. Although these changes were significant improvements for non-white and female Americans, it by no means ensured perfect equality, nor did it immediately end racism or sexism; however, it a reasonable hypothesis that these changes had a positive impact on the economic and educational outcomes of women and non-white Americans.

After Vietnam there was a long period without any single extensive conflict. In my data analysis the period from 1975-2001 is coded as a peacetime period. However, this period includes the intervention in Grenada, the Persian Gulf War in the early 1990's, and the intervention in Bosnia and Herzegovina, as well as numerous smaller operations.

This period of peacetime is drastically different from the previous peacetime period in 1955. Like 1955-1964 it was an all-volunteer force. However, in 1976 the VEAP program was established, granting soldiers benefits that were not quite as extensive as previous incarnations of the G.I. Bill, or as comprehensive as the program that covered the previous period of peace. However this bill was passed as soon as the period began, as opposed to a few years after it ended. That means that soldiers were more aware of the benefits before they joined the military. However, this period also had a new buy-in program that required participant contributions. There is some evidence in the National Survey of Veterans (NSV) that this program caused some confusion, leading certain military personnel to not take advantage of the benefits that were awarded them, and that some enrolled participants failed to pay into the program due to ignorance of the requirement. The Armed Forces started providing kickers to increase enlistment, likely because the benefits provided were insignificant to increase enlistment. There is no CPS or NSV data on how many veterans actually received kickers; they were often awarded at the time of enlistment to encourage soldiers to join the military.

By the time of the Persian Gulf War women were more integrated into the military. More than 40,000 women served in the war, as opposed to around 7,000 in Vietnam and there were far fewer positions that they were not allowed to hold. In 1994, President Clinton signed an order to permit women aboard combat ships and fighter planes. They were helicopter and airplane pilots, as well as artillery operators, and by 2001 it is estimated that 92 percent of the jobs in the U.S. Military were open to women (Jacinto, 2001). Similarly, by this time non-white soldiers were allowed to

serve in every facet of the military. That is not to say that there was no actual race or gender discrimination; merely that in the eyes of the law there was not, which likely implies that racism and sexism in the military was comparable, or less severe, than racism and sexism in the civilian United States.

In 2001 the United States invaded Afghanistan in response to the September 11th attacks. While the occupation and fighting in Afghanistan continued, the U.S. invaded Iraq, both wars continue today. The G.I. Bill for the first time in history is a buy-in program during a period of war. The military continues to be an all-volunteer force, although there is a significant presence of contracted armed forces and reconstruction groups such as Blackwater (now named Xi) and Halliburton, which offer competition to the military for personnel. It would be interesting to study what type of soldiers joins which force, but that is beyond the scope of this thesis.

Insofar as legislation is concerned, little has changed for women and non-white soldiers since the 1990's. Female soldiers now serve in combat duty in the military, ever since the "Risk Rule" was rescinded in 1994. Non-white soldiers do not have any limitation on the positions available to them.

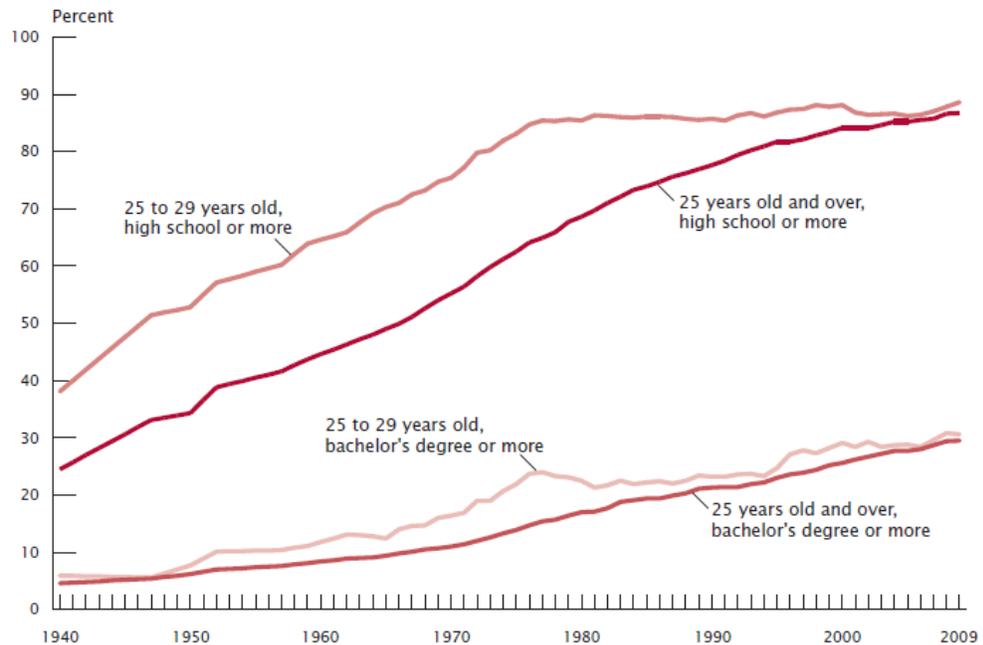
There are significant problems with the analysis of education and earnings for the Afghan and Iraq wars. The data are very recent, which means that some of the soldiers who have been surveyed are still in the military and have not yet had the opportunity to come back from war and take advantage of the educational benefits that are due them. Others have completed their service but may still be in college. Since non-veterans do not have a required service, they are likely ahead of their veteran counterparts in their educational process. This would put a downward bias on

service and education since some veterans who plan to attend higher education haven't had the chance, while their civilian counterparts have. Also any earnings regression would then include their current pay in the military as opposed to what they would be earning in the civilian labor market, and since observations without a job are not included in earnings regression, those military soldiers who pursue education later, are dropped from the sample leaving a gap in certain age groups.

The period from 1945 to 2011 is a complex time, filled with change and analytical complication. Figure 2, provided on the next page, I give as a reference of changes in the higher education racial demographic that graphically depicts some of the change in the United States. I have tried my best to sum up the most important changes during this time that will affect the outcome of my work. Some of these confounding factors have already been considered, and some questions asked about these periods have already been convincingly answered. I will now review those papers and sources as they are presented in the current economic literature.

(Figure 1)

Percentage of the Population 25 Years and Over Who Have Completed High School or College: Selected Years 1940-2009

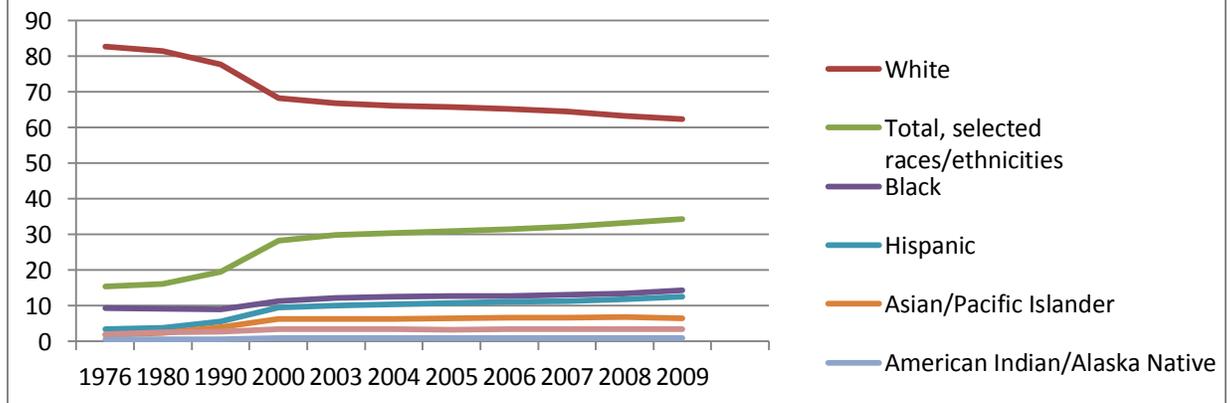


Source: U.S. Census Bureau, Current Population Survey and decennial censuses.

(Ryan and Siebens, 2012)

(Figure 2)

Students in Higher Education by Ethnicity*



*Data provided by the National Center for Education Statistics

Literature Review

In this chapter I will discuss other studies that have considered the outcomes and unique situations of specific minority groups and the relation of these outcomes to veteran vs. civilian status. These papers provide evidence that serves to reinforce the results provided by this thesis, as well as providing the background upon which this study was built.

It is important to consider that military veterans are looking for work in the U.S. economy later than they would have had they not served in the military. By virtue of having worked in the military, they will have had a certain set of experiences that have the potential to benefit or hurt them in their search for employment. The transition period from military to civilian employ has been coined as “bridging” (Browning et al, 1973). Browning separates the potential effects of bridging into five advantages: First, the military provides the means to obtain training and education after service as a substitute for the time that soldiers have "lost" in the military, as well as providing a wide variety of skills learned during one's tenure in the military. The means to obtain education is the focus of this thesis; however, the economic effect of being in a veteran can include returns to the skills taught by the military, such as office skills or technical skills taught in training, that are externally applicable. Second, the military increases the independence of those who serve by “severing their ties to the areas from which they came, and integrates many dissimilar people into the same unit” (Cooney, 2003). This independence may be beneficial when veterans are looking to relocate and adapt to a new work environment. Third, it

may be particularly beneficial for women to gain experience working in a male dominated environment, which may provide them with the “independence, self-confidence, leadership and masculine orientation” (Browning, 1973) that male employers in the United States are looking for. Fourth, the military gives its members the ability to work with the large military-style organizations and bureaucracies that dominate the United States working environment. Fifth, the military serves as a better bridge for soldiers that have the least amount of human capital upon entering the military. because those who are disadvantaged may have the most opportunity to gain from a certain homogeneous set of experience that the military would offer all of its members, a set of experiences that may be more congruent with those experienced by the majority group in society (Cooney et al, 2003). My results are consistent with the view that the military is indeed a positive bridging environment for the underprivileged in terms of education, but similarly to Cooney’s results, in my results, service itself does not seem to enhance earnings for underprivileged groups, so much as the indirect effect through increasing educational attainment. Through this paper, Cooney adds to the concept of bridging the effect of mothers postponing the birth of their children until after their period of service. For mothers who do this, he finds that they experience a significant decrease in future earnings outcomes because they are losing a key period in which they could gain work experience in order to raise their children. Depending on how prevalent this practice is, it may suggest that the effects of educational attainment are either higher due to compensating for childbearing, or those who don’t take advantage of education are also likely to suffer this income loss, which would bias the earnings effects of service downwards. Thus

bridging does not appear to be especially effective, except for the effect on formal education, and some disadvantaged groups' benefiting from the equalizing nature of the military.

Angrist and Krueger (1994), as well as several other papers, have found that WWII veterans earn more than comparable non-veterans from that era. However, Angrist found that serving in the military was actually a detrimental experience. By using a carefully constructed instrumental variable analysis based on birth dates corresponding with the draft lottery, he concludes that time spent serving in the military is actually detrimental to earnings, and that most of the effect of increased earning is due to selection bias and education. This result is consistent with the results provided by Cooney et al. (2003) as well as Stanley (2003), who concludes: "Because of the independent negative impact of WWII on education, much of the effect of the WWII GI bill was probably compensatory;" he also found that service in WWII is detrimental to economic outcomes. However, the educational provisions did provide for a positive impact on earnings in these studies. The majority of the positive impact of education was spent negating the negative impact of service, and only marginally increased earnings beyond what they would have been without military service. The results of my paper are consistent with this finding. Angrist also finds that WWII veterans are on average a year more educated than their civilian cohorts. This is consistent with my finding that service is detrimental to earnings when controlling for education. However, if the extra year of education can be attributed to the educational benefits that the veterans were provided with, this is a benefit of the G.I. Bill to be weighed against its costs.

There are several other studies which use instrumental variables to estimate the effects of education while controlling for other possible factors that may affect veteran's outcomes. For instance in Angrist and Krueger, (1992), the authors examine, using instruments to control for selection bias, how increased suicide rates due to military service might bias earnings results upwards. They hypothesized that higher rates of suicide and death in the military may cause veterans' outcomes to be upwards biased since the less educated soldiers and poorer soldiers may have a smaller chance of surviving military service. However, their results suggest that these biases are small, if not insignificant, eliminating one possible source of doubt.

I will later discuss in depth the content of the data I am using however; it is worth mentioning here why I chose not to follow the instrumental variable methodology that has been commonly associated with the hard-to -distinguish effects of the G.I. Bill. One focus of my paper is to estimate returns to military service over a large range of periods. The data I have chosen to use is a large common dataset with yearly waves, the Current Population Survey (CPS). Because these data are collected after military service and the majority of questions are about the current condition of the veterans, I lack the pre-experiment variables necessary to develop strong instruments. Instrumental variable regression is also a highly debatable technique, with economists and statisticians picking apart the choice of instruments and the cause of correlation. Even Angrist's well-established papers are not without criticism. For example, John Bound and David A. Jaeger wrote a critique of the choice of birth quarter being used to measure the effect of compulsory school attendance (Bound and Jaeger, 2000). A paper which is trying to measure a larger

effect more approximately in order to open new areas of study should perhaps not be based on an easily-criticized technique. In addition, the findings of the papers mentioned here suggest that the findings without instruments are still quite similar, albeit lower in magnitude (implying that the OLS results are indeed slightly biased upwards). This is a concession I am willing to accept as I continue to examine a very broad category of educational effects. In particular, if it is the case (which may or may not be true) that the degree of selection bias is similar over time, and then it would still be educational to trace the differing patterns of returns to veteran status by demographic group.

The work I am pursuing is not without predecessors. In study of educational benefits focused solely on Vietnam, Joshua D. Angrist found that “a post service grade increment of one year translates to an increase in earnings of about 4.3%” (Angrist, 1993). A rough estimate of the returns to schooling in this paper reveals an approximate 7 percent increase to one year of schooling. Although this may seem like a relatively large inconsistency, my results take into account mostly more recent periods, in which schooling may be more necessary in order to attain higher earnings and thus also have higher returns. Angrist also estimates the increase in education due to service at 1.4 years. My results suggest that this is the approximate upper bound, with women in their best period experiencing an increase of 2 years of education in WWII (which I will later explain may be the effect of having so many nurses). Angrist et al. (1993) instrumental variable approach also suggests that the results of standard OLS should reveal the correct sign for educational benefits and be biased downward since his instrumental variable approach finds a larger positive

effect of educational subsidies on earnings than his OLS regressions; this gives credence that my estimates of returns to the G.I. bill will be a lower bound.

Measuring factors in a natural experiment involving human behavior is never simple. One of the factors that affect all enlistees, whether drafted or otherwise, is the chance that they will choose to re-enlist. This would cause us to misidentify the benefits which the veteran would be eligible to receive. One of the changes brought about by increasing benefits, such as was done in the Montgomery G.I. bill, is that there is an increase in separation from military service. This is due potentially to attracting more college-oriented youth, who are interested in the pure benefit incentive of less expensive college education and want to take advantage of it sooner rather than later (Simon et al, 2009). But Simon et al. (2009) focuses on the change during a single period of war. In contrast, my results involve many periods with mostly decreasing benefits. Since the military commonly uses educational benefits to convince young citizens to enlist in the military, there may be a bias of citizens who either planned to go to college and then decided to join the military, or joined the military because they wanted to go to college. The two groups would be inherently statistically different. Those who chose to join the military for schooling as opposed to a career choice would be likely to stay in the military only long enough to achieve the full benefits available for each period. In addition, they may have gone to college at a higher rate since that is one of their goals. The second group would be a better control for the results of this study since their college choice may be independent of their choice to enlist. The group of people who choose to enroll because of educational benefits alone should change in direct proportion to the amount of

benefits that are offered which will exacerbate the effect of lowering benefits since there will be more enrollee's in the population and less in the military. However, if the economic returns to schooling prove to be more than the opportunity cost to the government of sending them to school, it is still beneficial to the government to not only achieve a quota of soldiers, but to invest in the American economy.

Women's outcomes are hard to equate to men's outcomes due to cultural and gender based factors. For instance, the job market for women has evolved throughout the 20th century to include more professions with higher earnings that thus have changed their economic outcomes over time. Similarly college education in 1945 was much more limited to certain areas of study for women, as opposed to in 2011 when most college has become co-ed and women outnumber men in college. Beyond earnings and years of education, there are also complex cultural effects such as child-rearing practices. Women tend to be held more responsible for their children than are men. Although the reasons for culture are debatable, culture can create a significant division of outcomes. Women's outcomes and their causes have inspired a very significant number of papers with many directly related to war and education. These studies inform military benefit analysis to the various biases that may occur in the study of female soldiers.

As previously mentioned, one of the bridging effects discussed was female soldiers learning to work in a male-dominated cultural and becoming accustomed to the traits that are valued in such a culture, as well as learning to work in a bureaucratic business environment. However, Cooney et al. (2003) found that these effects were insignificant and Melay confirms that: "The evidence presented here, at

least for white women, provides little evidence to support the contention that military service provides work experience that is of superior value to that available in the civilian labor market” (Melay, 1993). However in a 2009 study it was found that in relation to their cohorts, minority women veterans did enjoy an earnings advantage compared to their cohorts; as I will discuss later, this is consistent with my findings (Gottschalck and Holder, 2009).

Interestingly, one of the unexpected effects that may occur due to bridging (and is not included in the original theory proposed by Browning) is the effect of delaying child-birth. Cooney et al. argue that by having children when most of the workforce is gaining experience the veterans of wars are putting themselves at a distinct disadvantage in the workforce. This is mostly an effect on women since women are more likely to put children before career concerns than men are. The effect that this may have upon education is uncertain. However this may account for a considerable amount of why bridging is so ineffective in term of earnings outcomes. In respect to this finding, we would expect to see that women of a young age after military service facing the uncertain effects of childbirth. Since in some periods women’s jobs are guaranteed this would be reflected by an unobserved decline in experience.

One of the periods that data limitations make it difficult for me to study independently is the Gulf War. In 1991, in a record deployment of women, approximately 41,000 female soldiers were sent to the region (G.A.O., 1999). Angrist took this opportunity to study the effects of work-related separations on military

families. A few of the effects were significantly different for women compared to men. In particular:

Deployment of male soldiers had no effect on marital dissolution, though it did lead soldiers' wives to work less. In contrast, deployment of female soldiers led to a large and statistically significant increase in divorce rates, suggesting deployment of women placed a marked strain on marriages. Deployment of female soldiers did not affect husbands' labor supply (Angrist and Johnson, 2000).

This would be a very relevant effect on the projected economic outcomes of female soldiers as we shall see later that marriage increases the rate of education slightly. However it also significantly decreases earnings outcomes for women. This may also imply that the employment status of spouses may have earnings effects worth considering in further analyses of veterans' earnings.

Racism and racial segregation have a significant and continuing affect upon non-white Americans. The issue of how racism affects economic outcomes is not simple enough to account for with the explanation that jobs are slightly harder to obtain and earnings are lower. For instance, Sarah Turner and John Bound found that in the original instatement of the G.I. Bill during WWII, the effect upon African-American soldiers in the South of gaining these benefits may in fact have been insignificant to them and detrimental to white-non-white relative outcomes. These soldiers who returned to the South found themselves unable to take proper advantage of their benefits due to the highly segregated educational systems. Turner and Bound find that although northern educational systems were also significantly segregated, the effect was not as drastic as it was in the South. Meanwhile, the white soldiers who returned to the South did have a significantly increased amount of college education;

thus with a significant portion of the population gaining human capital, those who don't gain human capital may be even less desirable as hires (Turner and Bound, 2003). It remains to be studied how this effect in particular evolved over time and how it may have affected African-American enlistment.

Eligibility and Benefits Usage

Since my analysis is based on judging the effect of benefits due to service it is imperative to consider which veterans actually take advantage of the benefits offered to them. First I acknowledge that not every citizen who has served on active duty is technically a veteran and would not be eligible for benefits. To define veteran status accurately it is most helpful to use the Veteran's Administration definition of a veteran as provided by Day, 2007.

A veteran is someone 18 and older (there are a few 17-year-old veterans) who is not currently on active duty, but who once served on active duty in the United States Army, Navy, Air Force, Marine Corps, or Coast Guard, or who served in the Merchant Marine during World War II. There are many groups whose active service makes them veterans including: those who incurred a service-connected disability during active duty for training in the Reserves or National Guard, even though that service would not otherwise have counted for veteran status; members of a national guard or reserve component who have been ordered to active duty by order of the President or who have a full-time military job. The latter are called AGRs (Active Guard and Reserve). No one who has received a dishonorable discharge is a veteran. The Department of Veterans Affairs administers laws authorizing benefits for eligible former and present members of the Armed Forces and for the beneficiaries of deceased members. Veterans' benefits available under various acts of Congress include compensation for service connected disability or death; pensions for non-service-connected disability or death; vocational rehabilitation, education and training; home loan insurance; life insurance; health care; special housing and automobiles or other conveyances for certain disabled veterans; burial and plot allowances; and educational assistance to families of deceased or totally disabled veterans, servicemen missing in action, or prisoners of war. Since these benefits are legislated by Congress, the dates they were enacted and the dates they apply to veterans may be different

from the actual dates the conflicts occurred. VA estimates of veterans cover all persons discharged from active U.S. military service under conditions other than dishonorable.

This means that not every soldier who served in the military is necessarily a veteran. If they were dishonorably discharged they do not receive veteran status even though they may have served overseas—their rights would be revoked. This is also a form of selection; however the effect of this type of selection is likely very small. It is also interesting that military soldiers who served in the reserves become veterans if they are ever called forward for combat duty. In this way there might be a presence of reserve forces in my sample of veterans. If they are not called for service, under the Montgomery G.I. Bill, they have separate educational benefits that they can be eligible for without ever serving on active duty. However this requires a reserve term of service that is a minimum of eight years.

If a soldier is given veteran status and serves the required amount of time to receive the full benefits of the relevant G.I. Bill, there is still a complex decision of whether or not to pursue higher education. The G.I. benefits apply to more than just college. They may be used (often at a reduced rate) to pay for vocational training, flight training or development programs, which in some cases may be preferable to a college or vocational degree.

Ignoring the possibility of scholarships and financial aid, which were less available earlier in the century, veterans benefits only afford a soldier enough to pay for an in-state education without further assistance. Especially as the century progresses and the cost between an in-state public school and out of state public and private schools diverge it seems more likely that the only option fully granted by the

G.I. Bill alone is to pursue an in-state public college degree. This degree may not be worth as much as a private school degree, but it may also be the only program that would accept certain veterans with lower test scores, for whom the G.I. Bill is as good as a full scholarship.

In economics terms the decision to go to college is made on the basis of time preference. The best estimate of the personal net present value of higher earnings later can be compared against the present value of earnings now if the veteran enters the labor market. Of course the question is also more complex because veterans are free to partially enroll and receive some of the benefits towards credit hours. This question changes if the veteran in question is already employed or experienced in some form of employment, which may be more likely in the case of a draft when people were guaranteed their former employment. Also perhaps more likely in the case of a draft is that the draftee already has a significant college education, in which case they would be asking themselves whether they wish to pursue an even higher degree, which is a less likely outcome than the decision to attend any higher education. The case is similar for undereducated veterans who may feel unprepared for higher education without a high-school degree or the equivalent, although veterans after the Montgomery G.I. Bill were required to have a high school degree or the equivalent to qualify for benefits. G.I. Benefits historically could also be put towards a course to help achieve a G.E.D. If the benefits were used in this way it would still affect the amount of education the veteran receives and thus his return attributable to the Bill.

There are possible reasons to attend college other than monetary gain. Perhaps there is no job available at all and veterans will use their college benefits to bide their

time. Perhaps utility is gained from the increased knowledge and moral education that can be provided by some universities, or they wish to pursue a higher education to become qualified enough for a field that is known not to pay as much as the education was worth, but provides a position that the veteran would prefer to a higher paying one.. Similarly still possible is that civilians decide to attend college to find life partners. People who already have good career paths could decide that they would have a better social life after attending college, thereby gaining expected future utility as well. Although utility is a concept unique to economic theory, it is difficult to quantify: to avoid unnecessary complication this analysis relies on financial outcomes.

The choice to attend college involves many different factors for women veterans compared to male veterans. In the period following WWII, women had far fewer careers that were available to them as compared to men. Some of these careers such as nurse or schoolteacher required some form of higher educational degree. By the time of the Iraq War and the Post 9/11 benefits, although there are still very significant wage discrepancies between men and women, almost every career open to men is also available for women. Similarly, in the period directly following WWII, colleges that women could attend were much more limited and separated from male colleges. This could affect their choices to attend higher education either because the process is more or less selective as compared to men, or perhaps because in order to attain the few careers open to them they had to attend college (while it was more optional for men), making college highly beneficial to those women who attended it. However, it could also be that the college education women received was second

class because the better programs were mostly filled with male students and the programs available were less beneficial for women.

Similarly for non-whites, the choice to attend college may be influenced differently throughout the century by the changing availability and benefit of going to college. As mentioned in the literature review section, G.I. benefits may have actually hurt southern non-whites after WWII regardless of their veteran status, because they couldn't take advantage of them, while their white cohorts could. As the century progressed and colleges became more open to non-white soldiers, it is possible that because of the income gap non-white civilians are more likely to think that the armed forces are their best chance at attending college, which would increase their enlistment as well as their usage of G.I. benefits. This would suggest an increase in college enrollment as opposed to the white male trend over the past century.

Participation in the G.I. Bills

It is also the case that just as enlistment does not automatically align with eventual veteran status, eligibility for benefits does not automatically mean that a person will take advantage of them. Thus veteran status is not directly aligned with G.I. Bill participation. Table 1 gives some idea of the take-up rates on the G.I. Bill for veterans from different service periods.

(Table 1) Participation rates for G.I. Bill educational benefits used for school (millions):

Service Period	WWII	Korea	Post-Korea	Vietnam
School Benefits	5.7	2.1	1.3	6.2
Total Veteran Population	15.44	5.5	3.2	10.3
Percentage of Veterans Who Used Benefits	37%	38%	41%	60%

(Dortch, 2011)

Comparable numbers are not available for the Post-Vietnam Period and Iraq since the benefits of these programs still continue to be used. However it is quite surprising that even though benefits for the period of peace between Korea and Vietnam were introduced two years after the period ended, there is still a participation rate of over a third of all veterans, similar to the two periods before it.

Methodology

Data

The main data used for this study are provided by the CPS, March supplements, collected from 1989-2011 which I accumulated into a single dataset. This creates an extensive cross sectional (pooled) dataset of 2.3 million observations for the educational attainment regressions and 1.4 million observations selected for earnings regressions (i.e., those people in the educational attainment sample who reported earnings). The main reason that I chose to work with the CPS is that the data are relatively easy to aggregate to create sets of data with a considerable number of observations and the data collected by the Census Bureau are considered to be reliable.

I started with data from 1989 because of data limitations from periods before. In 1986 CPS collectors started to ask women respondents if they were veterans of the military. However, this question was not asked consistently and reliably until 1989 (Rocca, 1986; Bowling and Segal, 2007). Since my analysis has a focus on female and non-white outcomes it would be imprudent to use earlier CPS data. To make my sample as large as possible I used every available March CPS after 1989 with the most recent CPS in 2011. The reason I needed a larger data was to enlarge small sample groups, such as Korean War female veterans, to a point where the analysis would be reliable. Also, a larger sample size would improve the performance of population sampling as well as provide a set on a larger timescale. 1989 would more efficiently capture WWII veterans without longevity selection, and any survey before

2001 would be unable to record any of the effect on veterans of the Iraq and Afghan conflicts. There are some discrepancies and data differences between the surveys that will be discussed more in the description of variables section of this chapter.

The March supplement provides more detailed earnings that are commonly used when calculating population earning analyses. There are also a significant number of control variables about every observation arranged in a cross-sectional format. The data requires minimal cleaning and read-in files are available on the National Bureau of Economics Research website.

The inclusion of both veteran and non-veteran observations is the key to this analysis. The CPS includes variables that designate both veteran status and the period of service. Indeed, the wording of the service question, “have you ever served on active duty” is one prerequisite of eligibility for the General Infantry Bill, making the question much more precise than “have you ever served in the Armed Forces.” The set of answers for the period of service question varies by CPS year. By including non-veteran observations in this analysis I can control for cultural factors outside of the influence of the military and its benefits. For instance, the general increase in college enrollment in the United States over the course of the 20th century would create a biased time trend if not controlled for. Running a regression without civilian cohorts using the NSV I find that the war variables are heavily biased by the time trend and other effects are unidentifiable. Having the general population in my sample allows for control of discrimination effects on both women and non-whites that occur inside and outside the military providing more precise figures on the effect of service for these groups.

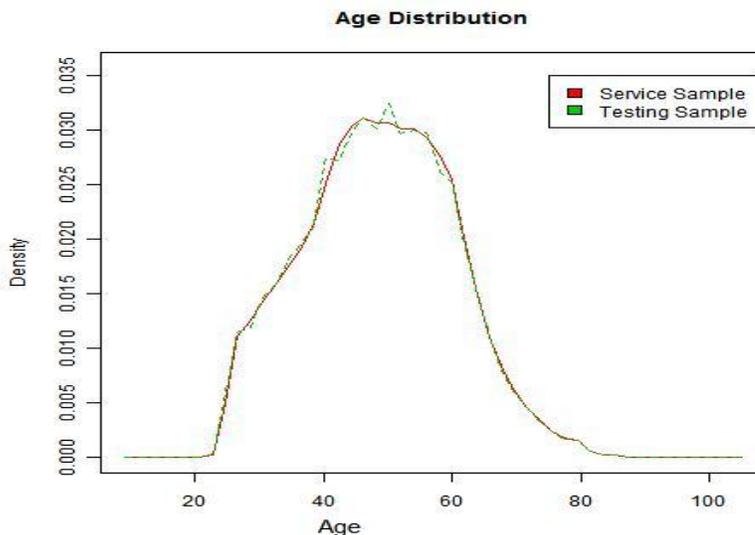
Sampling

In order to measure the effect of educational benefits on soldiers, one of the most important issues that must be tackled is the issue of sampling. The CPSs contain sufficient data on veteran status since 1989; any CPS before 1989 failed to ask women if they had served in the military, which has placed a significant data strain on the analysis of female veterans. Thus the first restriction on sampling is that only contemporary data since 1989 up through 2011 (the most recent available CPS sample) are used. In each case only the March CPS sample can be used of the monthly samples, as it is the only one with sufficient demographic information. Second, since the more recent periods of war are relatively short, the age distributions of people who served in the recent wars are fairly compressed. If we analyze the sample against the entire population the low variance in the age of veterans compared to the population would yield biased results; even controlling for age explicitly in the regression (which I do) would be unlikely to control sufficiently for this sample construction bias. For example, in the 2005 CPS the subsample of WWII veterans is quite small due to their advanced age and has a high mean age, while the civilian sample would have a much lower mean age and be much larger. To combat this problem, I employed a method of random population sampling from the civilian subsamples that attempts to create a civilian cohort sample that matches the specific veteran cohort sample in terms of its age (and gender) distribution.

Out of a total of over 1.6 million observations for the earnings regressions and 2.2 million observations for the educational attainment regressions, each cohort sample was separated by the CPS survey year, age groups of five year intervals,

which war was being sampled for, and the distribution of gender for each war/peace period. I chose to group the ages in five year intervals for the sampling because in some extreme cases observations were limited and the number of citizens was less than the sample that was required (I sample without replacement so as to maximize informational content in these created samples except for a few smaller samples where the pool wasn't large enough and replacement was required). For instance, in the 2009 CPS earnings sample, there are 9 males from 85-90 who did not serve in WWII. However there are 22 males age 85-90 who did serve in WWII. The problem of having a smaller control then testing group would be exacerbated if the age groups were more restricted. In the earnings sample this bias the control sample towards the younger side of each five year interval since the samples were both approximate normal distributions with different means, the population mean was consistently younger than the war mean in each age group, this creates the appearance of spikes in figure 3. For example the control will have more 51 year olds but less 55 year olds, this will make the comparison look jagged.

(Figure 3)



To design the sampling algorithm effectively, I exported a randomly sorted copy of my vetted earnings and education data (separately) from Stata into R. Since R can handle multiple data-frames simultaneously, I was able to create subsets of my complete data set in terms of age-groupings, gender, the year the CPS data was collected, and the war cohort I wished to sample for. I would then count the number of observations in each of these divided subsets, and randomly sample, without replacement, from a subset in which all of the specified values were equal the number of observations that I had counted. The only difference between the subsets is that no observations in my corresponding subsets served in the war I was sampling against.

Because my method involved taking over 3000 subsets, I divided the scope of the program to only handle a few CPS years as a time, and merged the resulting excel files. In some cases, I was unable to sample without replacement due to my sample sizes, in which case I had the program automatically employ replacement when it was required (only in a few outlying cases). Upon loading the excel files back into Stata, I appended the testing samples taken to my original data, with a 7 digit variable to denote exactly which subset it had come from. Descriptive statistics taken of the samples verified the competency of the sampling methodology employed.

National Survey of Veterans

The CPS includes most of the variables I need for this paper. The variables that it does not include, specific start and end dates, questions about veteran's choices to take advantage of benefits, are mostly included in the NSV. The NSV is a

government survey taken approximately every decade. The most recent survey took place in 2011 and only very recently became available for researchers. I utilize information from this survey in my thesis only to cross-check the baseline variable values for my CPS cohorts versus the NSV cohorts (i.e. service periods). But this provides a valuable cross-check on the CPS reliability regarding veteran-related information.

While the NSV data is technically available for public use, it was readily not available online. Since the 2010 data was collected so recently, descriptive statistics only became available in August 2011. The information online for how to obtain the data related only to the 2001 Survey of Veterans, and the contact numbers were disconnected. After emailing the Department of Veteran's Affairs research assistants, the data was eventually sent to me in the form of a compact disk via the mail.

While I would have liked to have used the NSV further, the largest limitations of the NSV for purposes of my study are its lack of a civilian control population, and the fact that the government has chosen not to disclose the individual earnings information, as well as a few other possibly identifying variables, to public researchers. However, the NSV also has a more limited sample size than the CPS and since the data was only collected in 2011, there is a lack of information for veterans closer to the WWII era. In spite of these limitations, the NSV provides a wealth of information. With it, I will be able to determine the accuracy of the CPS veteran samples that I have taken, as well as answer several questions with information not provided by the CPS.

Obstacles to analysis

There are many obstacles to an analysis of veterans' benefits. However due to the previous work that has been done as well as the structure of the regressions and sampling that I have done, the results of this thesis, if not entirely convincing, still maintain a position upon which further work may be constructed.

Longevity selection is one of the most prominent causes of bias caused by death in the line of duty, as well as old age. This problem is most apparent in the WWII sample since they are the oldest sample of individuals it is likely that longevity selection has played a role in changing the make-up of the sample. This would effect would be biased based on what characteristics determine long life. For instance, perhaps a healthy and expensive diet would prolong life, making older samples biased as higher wage earners who are more educated. By selecting appropriate cohorts through my age sampling method, the surviving citizens with whom these soldiers are compared have also been subject to the longevity selection bias of age which should effectively control for those effects.

Selection through military service, i.e. the loss of less educated soldiers because they are less likely to survive in combat is a difficult issue to measure. However because of significant work in the literature as well as the structure of this study, issues created by military selection can be mitigated. A few of the papers previously discussed used instruments and test scores to control for after military benefits usage and schooling (Angrist et al, 1993) which would be robust to survival selection, by certain measures of intelligence, since test scores are used as an intelligence control. These results are consistent with the ones found in this paper. In

addition the structure of this paper being a measure of several different periods, assuming intelligence longevity selection is consistent over time we should see a similar bias in each period of wartime, which would have little effect on the differences between each period. A more likely effect is the raising of negative coefficients on less educated groups such as non-white veterans since they would experience more selection by this hypothesis. Since their service on the front lines of military combat is variable over time this is hard to measure. However, since the effect is the opposite of the one uncovered, it is likely either a small effect or insignificant. Also since women in the military were unlikely to see action, this effect shouldn't change the outcome of women veterans until the Gulf War, and even then since they were very unlikely to serve on the front lines, even in the Iraq War the effect isn't a dominant issue.

Selection into draft wars poses a significant issue. As mentioned previously the Vietnam draft and the WWII draft did not select candidates randomly nor did the draft select candidates identically in both periods. The WWII draft selection exempted the largest number of people for physical and mental disabilities; only 34 percent of exempted draftees were exempted due to occupational reasons and the analysis done by Angrist and Krueger (1994) suggests that people with higher earning potentials tended to enter the military in WWII giving the false appearance of higher outcomes. This is a result that is harder to control for in my analysis; however, it is important to keep it in mind. They also hypothesize that in Vietnam soldiers tend to have decreased earnings outcomes due to the selection process. According to Angrist and Krueger (1994), there was a 5 percent increase in college enrollment for people

who were at high risk of being drafted for the military during Vietnam. There was also a significant increase in the number of people who enlisted to avoid being drafted so that they could serve in the military on more favorable terms. These factors point to a downward bias in the outcomes of veterans of Vietnam, this should affect more affluent groups more and less privileged groups such as non-whites less. It is also important to note that any draft related effect doesn't directly apply to women who choose to serve in the military since women have never been eligible for the draft. However the baseline of the difference for women from white males would be affected. Comparing Vietnam to the periods before and after, as well as the earnings and educational trends that began in WWII, I find that there is a lack of evidence that draft avoidance had an overpowering effect on veteran's outcomes. If there was we should see a downwards spike in earnings and education in Vietnam unrelated to the periods on either side.

Comparing draft and non-draft wars presents a problem that is neither easily overcome, nor is there a significant body of work that has been done on the subject. The easiest way to avoid selection bias is to provide pre-service variables which the CPS and NSV both lack. Instead by comparing a few periods of draft and non-draft wars the comparisons between them offer insight into the differences of selection caused by the inherent bias that may exist, because there is a non-draft war, as well a period of peace before and after Vietnam, there is a reasonable comparison group, although perhaps in the future foreign war data could be used to increase the sample size.

One of the data limitations I am faced with is that only in the most recent Current Population Surveys did the survey ask about multiple periods of service. If a soldier decides to serve in the military for a career, it is much less likely that they will use the G.I. benefits to pursue an education outside of the military. Also, when comparing their educational benefits it will not be taken into account that they are eligible for the benefits provided by a different period. These observations form a self-selective group that is hard to predict.

There are also significant outside influences that affect education and earnings outcomes that are not often talked about in the literature. One that may be more important in more recent periods is the presence of non-military financial assistance for the purpose of education. Such as government-citizen loan programs and grants, scholarships from institutions, as well as financial aid offered to students from low-income backgrounds by private universities.

Description of Samples and Variables

For the education and earnings regressions I used two different samples from the CPS. To avoid incomplete data I dropped any observations that failed to report their age. Failure to report this variable makes it highly likely that the observation will be an uninformative one. Similarly, if the observation has not reported, or has a negative value for numbers of hours or weeks worked the observation will be an unnecessary outlier of this analysis. For analysis involving earnings I also decided to remove all observations for which the reported personal income was negative and only include observations that are reported as working in a public or private industry. This means removing observations that own their own business or earn money in a

freelancing manner. In addition I have excluded observations that are outside of a reasonable age range. I have chosen 25 to 90 years, because at the age of 25 veterans would have plausibly been able to take advantage of the benefits that are promised to them. I have also truncated the data at the age of 90 because the older ages are uninformative outliers.

For the purpose of this analysis there were three main types of variables: control variables, test variables and grouping variables. Although the results of the control variables are the least relevant to the numerical conclusions of the paper, their construction may often be the most important to the validity of the analysis. For this reason I shall describe all the variables and their construction in detail so that my results may be fully understood.

The variable for age in the Current population is a self-explanatory categorical variable denoting the age of the observation. In 1995 the label of the age variable was changed without any effect of the coding of the variable. In all of my regressions I have also chosen to include an age-squared variable to reflect the non-linear nature of experience. We would expect that the value of a year of experience would increase yearly for young a middle aged people, until later in life when the value of a year of experience would decrease over time since we can expect elderly people to start decreasing their earnings.

The age variable presents some interesting and possibly questionable results. Since each war has a different age mean and limited variance, there is an increased potential for bias. For instance, in the extreme cases of WWII and Iraq we have either an older population with a youngest age of 58 and in Iraq a case where 99 percent of

the observations are less than 60 years old. This may explain why the regressions that will be presented have a changing parametric form in the age variable, from a positive non-linear effect to a negative non-linear effect, since they represent different places along the age distribution.

I have decided to include a variable for rural locations in my analysis. People in rural locations tend to have lower earnings due to being in a lower-paying labor market. The CPS uses the Core Based Statistical Area code to determine the density of the population in the area of the respondent. The survey codes anyone who lives in an area with a CBSA code of fewer than 100,000 as non-metropolitan, which I then code as rural. As seen in the results, the coefficient of rural is significant and in the direction that is anticipated (reducing educational attainment and income). For the sake of this analysis rural is a good control for citizens and veterans being possibly disproportionately living in rural areas, an effect this study is not focusing on.

Very similarly to the idea of including a control for rural locations, I have inserted a control for people currently living in the southern parts of the United States. This includes Delaware, Maryland, Washington D.C., Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma and Texas. This is another locational variable only it is more geographically specific. Similarly to rural this variable simply indicates whether an individual is currently working in a lower earnings job market of the United States.

When analyzing earnings it is natural to include educational attainment as a determinant. Indeed, this is the primary channel through which the G.I. Bill is

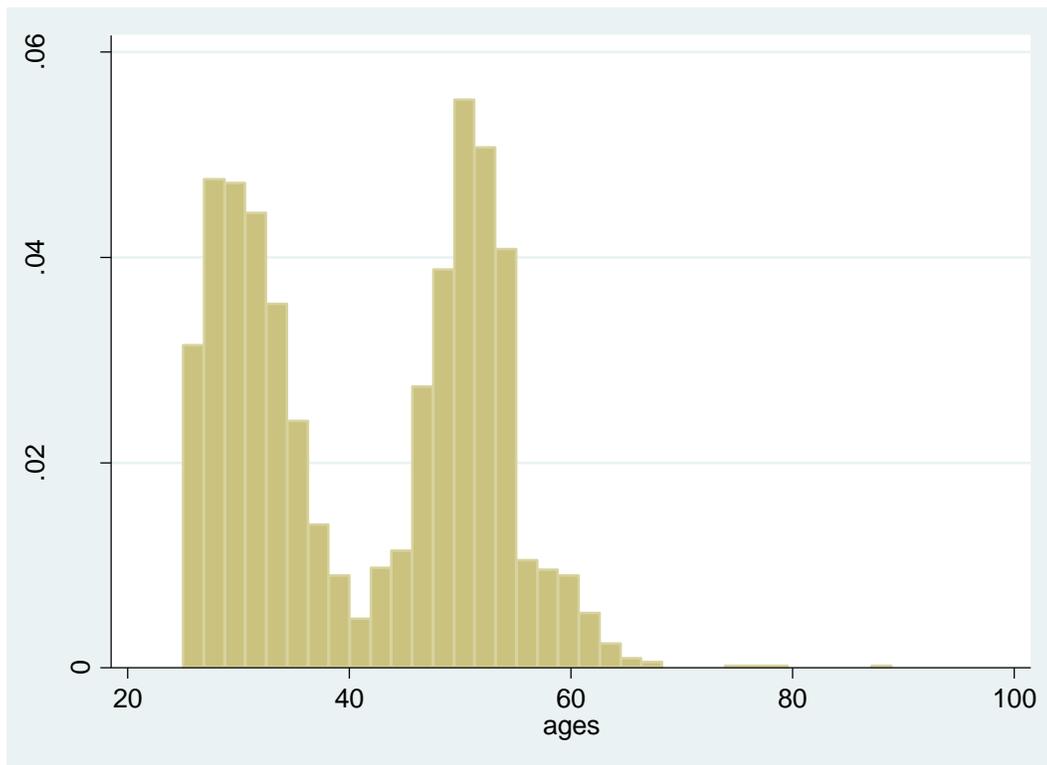
hypothesized to affect economic outcomes. To make things simple I rearranged educational attainment by years of education completed. The more recent CPS data has education coded on a scale above 30. The analysis is difficult because every year of attainment is not given a distinct value for all of the CPSs. In 1989-1991 the Surveys have specific data on completed years such as 0, 2, 3, 5, 7, 15 and 17 that are not included in the surveys of 1992-2011. This does not pose a significant problem because even the less specific variables are ordered correctly and on the same scale. Also since the main distinction we are trying to find is between cohorts of similar years this effect is non-disruptive. I then divided this variable into years of college attainment and years of general school attainment to reflect the added value that is given to years spent in college as opposed to years in elementary school. This generally increased the r-squared value as compared to using education and education-squared terms and provided a more easily comprehensible measure of returns to a year in college.

Although one of the most important variables, the gender dummy variable is one of the simplest variables. The CPS includes a dummy variable that denotes the biological gender of the observation as either male or female. I decided to code my dummy variable equal to 1 for women. I also add a dummy for observations that are married and interact it with the dummy for woman, as there could be a different effect on women than men for being married due to culture as well as motherhood roles and childbearing. Notably, many more women who did not serve in the military were married than those who decided to serve. There are several types of married-ness in the CPS; for simplicity I chose to only include in the married category those people

who had a spouse present in their household. That includes married with a civilian spouse present and married with an armed forces spouse present. This doesn't include couples where the spouse is absent, divorced, separated or deceased.

I then include the service-in-period variables. These variables are dummy variables denoting service in the specific wars in which these observations took part. In each of the CPS surveys there is a variable for WWII, Korea, and Vietnam. Iraq is also included where applicable. Since the service variable is still coded as positive for anyone who served in the military but not in these wars, there are two obvious age distributions that appear to have served in the military but in no war. They correspond directly to assumptions about the age in which someone would decide to serve in periods of service between the Korean War and Vietnam, and between Vietnam and the Afghan War. A 25 year old veteran in 1990 could not have served in 1963, but likely served from 1975-2001. For example, I chose to separate ages in 1990 by either side of 40 years old as being in peacetime during 1955-1964 and 1975-2001. (See Figure 4 on the next page)

(Figure 4) Veterans that are not coded in any war, in CPS March 1990 by age



One of the complications encountered with the service-in-period variable, as mentioned earlier, is that from the majority of the CPS data only one term of service is recorded. To avoid a large amount of missing data it was necessary to not delineate multiple period veteran's and use a variable that with limited exceptions includes the most recent term of service.

For non-white and women veterans there is likely a distinct difference in the returns to service relative to white men. Since this is the core topic I wish to analyze, my results will focus on the results of the interactions between women and their returns to service as well as non-whites and their returns to service.

The variable non-white is coded from a CPS variable that has been collected in all of the CPS surveys. The only people who are not coded with a one for this

variable are people who are white-only. Hispanic information has only come out more recently and is not coded separately to maintain consistency across the surveys. That means if an observation is Hispanic and white, they will be coded as white. However, if an observation is Hispanic and another non-white ethnicity, they will be coded as non-white. This does have a significantly confounding effect on the model since as we will see later the group defined as Hispanic by the NSV is even less privileged than non-white observations. Their increasing presence later in the 20th-21st centuries may have increased the relative positive educational and earnings effects perceived on non-whites throughout the periods.

The financial outcome variable that I chose to predict with my earnings model was total wage and salary earnings. Measuring financial outcomes can be tricky because the finances that affect a person come from diverse sources. Family income is perhaps a better measure of total income available to an individual, and investments as well as social security and other benefits and service payments all contribute to an individual's financial outcome. However, when measuring the effect of education on financial outcomes it is likely that the salary and wage earnings of the individual are the most affected element of their financial outcomes. Good investments made by the individual as well as profitable personally owned businesses can also be the results of education; however salary and wage are often a better measure of the effect of qualifications as opposed to free market success where the causal effect of education is more ambiguous. Higher educated individuals may have or join better financed families regardless of their personal earnings, but this effect is also ambiguous, and would detract from the focus of this paper.

Education Analysis

Using Ordinary Least Squares regression analysis I estimated the equation:

$$\begin{aligned} \text{Education} = & \text{Constant} + \beta_1 \text{Age} + \beta_2 \text{AgeSquared} + \beta_3 \text{Rural} + \beta_4 \text{South} + \beta_5 \text{Women} + \\ & \beta_6 \text{Married} + \beta_7 \text{Women*Married} + \beta_8 \text{Service in Period} + \beta_9 \text{Women*Service} + \\ & \beta_{10} \text{Non-White} + \beta_{11} \text{Non-White*Service} \end{aligned}$$

Each variable is as described in the variables section of the paper.

(Table 2) Means of Sample Used for Education Regression Analysis (CPS)

	Wages	Education	Women	Ages	Non-White	Married	# Observations
WWII	6462	11.67	0.03	73.50	0.12	0.73	109052
Korea	19983	12.52	0.02	66.13	0.13	0.77	75126
Post-Korea	32351	13.14	0.03	60.48	0.13	0.77	80994
Vietnam	44738	13.55	0.03	52.48	0.14	0.75	188072
Post-Vietnam	44785	13.43	0.13	38.09	0.18	0.66	138302
Iraq	41635	13.66	0.18	35.97	0.21	0.60	8206

(Table 3) Means of War Veteran Education Sample (CPS)

	Wages	Education	Women	Ages	Non-White	Married	# Observations
WWII	6178	12.29	0.03	73.59	0.08	0.75	54526
Korea	20313	12.92	0.02	66.19	0.10	0.78	37563
Post-Korea	32765	13.44	0.03	60.53	0.11	0.78	40497
Vietnam	44424	13.74	0.03	52.54	0.12	0.75	94036
Post-Vietnam	44337	13.51	0.13	38.06	0.20	0.67	69151
Iraq	43885	13.89	0.18	35.91	0.22	0.63	4103

(Table 4) Means of Non-War Veteran Education Sample (CPS)

	Wages	Education	Women	Ages	Non-White	Married	# Observations
WWII	6747	11.06	0.03	73.40	0.15	0.70	54526
Korea	19654	12.12	0.02	66.07	0.15	0.77	37563
Post-Korea	31937	12.85	0.03	60.42	0.16	0.77	40497
Vietnam	45052	13.37	0.03	52.42	0.16	0.75	94036
Post-Vietnam	45232	13.34	0.13	38.11	0.16	0.65	69151
Iraq	39385	13.43	0.18	36.02	0.21	0.57	4103

Table 2 presents means for the entire sample upon which these regressions are based. The table shows a clear trend of increasing educational achievement. Recently, we see a very large increase in the number of women who served in military as well as non-whites that choose to serve.

Table 3 presents the subset of the sample which contains the soldiers who served in the period upon which the full sample and regression is based. We notice that the increase in non-whites in the military is similar to the increase of non-whites in the civilian population. The same comparison cannot be made of women since the sampling methods matched the number of women in war to the number of women in the population.

It becomes apparent through these tables that the earnings for the WWII through the Post-Korean period are considerably lower than the following periods where we see a dramatic increase because the sample becomes younger. Since the data was collected from 1989 – 2011, there is a considerable retirement as well as possibly a longevity selection bias (those who live longer may have different characteristics) on earnings and earnings. The effect that this will have upon earnings results is unclear. Perhaps observations that are less privileged will appear to have

higher earnings since they will be unable to retire financially and thus shall still take part in the work-force. However the effect on education is less dramatic because retirement selection doesn't affect educational outcomes. The effect of longevity selection on education is unclear; however the means and the results are consistent with the literature as well as with the conclusions that may be drawn from the other periods.

The civilian population sample used in this regression is presented in table 4. The most striking statistic is that while the earnings are relatively similar between the two groups, the military sample is consistently more educated, though less so in more recent periods. Also non-whites are more prevalent, for the most part, in the population than in the military. By Iraq, non-whites are more prevalent by percentage in the Military than in the population. Overall the populations are quite similar in terms of all other variables. It is interesting to note that the marriage rates in the population and in the military are quite similar. The argument that service puts strain on relationships and marriage is less founded when looking at these statistics.

(Table 5) Mean of War Samples in the NSV

	Education	Women	Age	Non-White	Hispanic	Disability
WWII	12.82	0.04	86.29	0.04	0.18	0.20
Korea	13.44	0.02	78.85	0.04	0.13	0.18
Post-Korea	13.57	0.02	72.20	0.05	0.09	0.22
Vietnam	13.84	0.03	63.67	0.08	0.11	0.42
Post-Vietnam	14.15	0.15	51.03	0.14	0.10	0.56
Iraq	14.10	0.20	38.54	0.15	0.14	0.84

Finally I included the NSV mean statistics for each group of veteran cohorts for each war as Table 5 (above). This is meant to be a consistency check for the CPS to make sure that the sample is reasonably collected and the means are reasonable.

Since the Survey of Veterans does not supply individual wage data to public researchers, it was not available. The most strikingly inconsistent result is that the NSV samples appear to be more educated than either the CPS population with veterans, or just veterans. But this is an erroneous appearance due to a lack of variable specificity with respect to education in the NSV. The survey codes all observations that have had any schooling as at least ninth grade, and everyone above that as in high school. Also it assumes a certain number of years of education for certain degrees that may or may not be true. However the trend is still similar throughout the periods. The number of women as a percentage of veterans is quite close. The samples do have an inconsistent number of non-white observations; however again that may also be explained by coding differences. It appears that in the NSV there are no divisions made for people of multiple races; they are therefore categorized as whichever race they identify with most. In the CPS the survey only includes fully white people as white, while every other ethnicity is non-white.

NSV Educational Attainment Means

(Table 6)

	White	Hispanic	Black
WWII	13.13306	9.669014	12.2381
Korea	13.47143	11.25581	13.06452
Post-Korea	13.72389	10.61806	13.19608
Vietnam	13.81902	11.64832	13.41358
Post-Vietnam	14.33368	12.43111	13.98925
Iraq	13.77075	11.83019	13.8913

The NSV allows us to look at Hispanic results as well. Hispanics represent about 5 percent of all observations in the NSV sample. In Table 6 above it is clear that Hispanics are significantly less likely to pursue a higher education even if they serve in the military since this is a military only sample. If this group were included

in either non-white or white they could significantly lower the means of that group and as mentioned before the ideal situation would be to separate them. However, since the data isn't available we must simply keep in mind that the figures presented for the educational attainment regression will be underestimated for white observations and overestimated for non-white observations.

(Table 7) Years of Education OLS Regression Results for Six Service Periods*(Coefficient,
T-Statistic)

	WWII		Korean War		Peacetime 1955- 1964		Vietnam War		Peacetime 1975-2001		Iraq War	
Age	-0.362	***	-0.075	***	-0.067	***	0.107	***	0.078	***	0.114	***
	-10.920		-2.680		-4.970		13.990		9.540		5.490	
Age squared	0.002	***	0.001	***	0.000	***	-0.001	***	-0.001	***	-0.001	***
	10.990		3.000		4.090		-13.920		-6.890		-3.960	
Rural	-1.031	***	-0.949	***	-0.864	***	-0.673	***	-0.572	***	-0.531	***
	-42.710		-34.510		-34.460		-43.250		-35.280		-7.560	
South	-0.503	***	-0.333	***	-0.239	***	-0.265	***	-0.099	***	0.077	
	-21.500		-12.710		-10.230		-18.230		-6.910		1.370	
Women	0.454	***	0.019		0.208	*	0.162	**	0.262	***	0.547	***
	4.590		0.120		1.750		2.000		6.860		4.300	
Married	0.734	***	0.683	***	0.590	***	0.565	***	0.517	***	0.472	***
	28.890		22.890		22.050		35.800		33.610		7.420	
Women*Married	-0.397	***	-0.499	***	-0.380	***	-0.354	***	-0.216	***	-0.251	*
	-3.260		-2.890		-2.990		-4.150		-5.330		-1.780	
Service In Period	1.040	***	0.651	***	0.458	***	0.315	***	0.168	***	0.410	***
	44.560		24.860		19.350		21.530		10.880		6.320	
Women*Service	0.969	***	0.839	***	0.502	***	0.478	***	0.444	***	0.122	
	8.040		4.870		4.000		5.760		11.310		0.880	
Non-White	-1.513	***	-1.237	***	-0.860	***	-0.640	***	0.058	**	0.033	
	-35.530		-25.730		-20.530		-24.840		2.250		0.350	
Non-White *Service	-0.012		0.611	***	0.561	***	0.266	***	-0.249	***	-0.065	
	-0.160		8.220		8.640		6.920		-7.170		-0.500	
Constant	24.318	***	14.320	***	15.202	***	10.496	***	11.233	***	10.441	***
	20.110		15.520		37.350		52.180		72.020		26.100	
Adjusted R ²	0.075		0.048		0.037		0.028		0.028		0.049	
# Observations	109052		75126		80994		188072		138302		8206	

Note: * 90% Confidence **95% Confidence ***99% Confidence

Table 7 shows the results from the regressions on educational attainment. The numerous highly significant variables do suggest that the model does produce reasonable coefficients and their effects upon the model assuming no fundamental model misspecification. Overall fit is low, however, as many other factors affect educational attainment in addition to those available in the CPS sample¹.

The number of observations per cohort varies dramatically since the surveys range over a large period of time and some periods of war had many more veterans than others since they lasted different durations and required different commitments. In addition, longevity selection has a reductive effect on the older war cohort samples and for the most recent two periods coincided with the collection of some surveys there weren't as many veterans to sample from as there would have been if the wars were sampled strictly after they ended. In the case of the Afghan/Iraq Conflict, these periods are still ongoing. The much smaller sample size for Iraq may be why the significance of most variables is lower than it is in previous wars. However, 8206 observations is still a large sample.

Control Variables

The control variables for these regressions offer some insight into the changing nature of education over the past 60 years. There are distinct changes over time in the form of the age coefficients. In WWII the linear component is negative and quite large, the non-linear component is also quite large but positive. By Vietnam this relationship has inverted, and then by Iraq the relationship is mostly affected by

¹ There is a possibility that there will be some form of omitted variable bias, which could affect the significance and effects outlined here. Any omitted variable would cause correlation between the error term and a regressor violating the Gauss-Markov Theorem. However, previous work that I have explored has been well received with similarly estimated equations.

the linear component. There could be several reasons for this changing relationship. Perhaps longevity selection has affected the sample for earlier periods. The recent shift from older to younger veterans suggests that education has become more prevalent in the younger generation, which as shown in the education trend graphs earlier (Figures 1 and 2), is true.

The rural coefficient demonstrates the changing nature of living in small towns over time. People who live in rural areas from the WWII-era are predicted to be one year less educated than WWII-era people who do not live in rural areas. As the century progresses the disadvantage of living in a rural area shrinks to half a year of education by the Iraq War.

The coefficients for the South could also be analyzed with the additional idea of segregation. It was suggested earlier in this paper that black veterans of WWII couldn't take advantage of their education as often if they lived in the South, perhaps as segregation ameliorated this limitation was less restrictive and the increased educational attainment of the African-American community caused these factors to be mitigated, but not erased.

The variable married is very important because of the confounding effect that it has upon the women veteran population. According to the CPS 75% of male veterans are married while only 55% of female veterans are married. This may partially represent that there are more women in the recent periods which implies that the population of veteran women is younger. Men who have served have a mean age of 56, while women have a mean age of 47. However, even in exclusively the Iraq conflict where the mean age differs by 2 years (36 versus 34), women who served are

56% percent married while men are 65 percent married. In the general population with matched age-groups women are 58 percent married and men are 56 percent married. This suggests that civilian women are more likely to be married.

Being married does suggest a higher level of education as the coefficient on married indicates an increase by half a year or more throughout all 6 cohorts, with a .3 year decrease from the WWII cohort to the Iraq cohort. It is doubtful that by getting married someone is more likely to pursue an education unless one spouse working enables the other spouse to have the financial freedom of attending school. It is possible that educated people are more likely to get married. Perhaps because people who are more educated are more desirable as partners, this may suggest that people may have chosen to attend higher education to find a partner or perhaps educated people are correlated with people who want to get married by an unknown factor. This may present a problem of reverse causality where education explains marriage. There may be an opportunity in a different study to employ instruments to estimate which of these explanations is more compelling.

These results suggest that the rate at which marriage affects women's education (approximately .3 years) has remained relatively constant over the past 60 years. Married men have seen a decline in the difference between their educational attainment and unmarried men's educational attainment. The change may be due to increased college enrollment or a cultural shift away from marrying better educated men. However the shift (.22 years) is too small to lead to any drastic inferences.

Primary Independent Variables

The coefficient on service in period for white males is quite significant in WWII but decreases drastically over time. In WWII, men who served had a predicted one year increase in educational attainment. This is either due to selection or to G.I. benefits. Although it becomes more convincing as the century progressed that the change must at least be partially due to benefits. In the Korean period the coefficient fell .35 years, although predicted education for a white male in service actually rose more than .6 years. This dramatic increase is due to non-Korean War veteran school attendance dramatically rising after WWII (a considerable number of WWII veterans who had increased school attendance are in the Korean War period sample) and veterans still have a .65 year increase in schooling over non-veterans in their sample. This advantage that continues even when the general population education increases dramatically suggests that military service promotes education beyond that of civilians.

This trend of falling differences between soldiers and civilians and yet increasing educational attainment continues through Vietnam. On the hypothesis that the G.I. Bill had a large effect on education, we should see a large dip in veterans who serve in the Post Korean War period since their benefits were only offered retroactively. Since these veterans were not simply serving the required 180 days to receive benefits and go to college since those benefits were unavailable they likely served for longer. It is likely that many of these veterans either served in Korea, or served late enough in the period that the gap before obtaining benefits was not prohibitively great. The coding of the variables doesn't allow us to see multiple

period services to measure this effect. However, according to Dortch (2011) almost half of the peacetime only veterans took advantage of the benefits offered to them two years after their term of service ended. Since so many veterans took advantage of the benefits we should not be surprised that educational attainment did not fall more in this period.

In the peacetime period of 1975-2001, education dips for both for both the civilian and veteran groups (See table 8 on the next page). This should be explainable for veterans since the VEAP benefits were much less comprehensive than the previous G.I. Bills, requiring them to pay into the program. However, both the civilian and the veteran education change can be explained by the age sampling. Since the CPS surveys I use begin in 1989, many of the people in this period will not have had the chance to take advantage of higher education by the time they were surveyed. Some of the veterans may still be in the military, and it is plausible that the civilians are taking breaks either before college or before higher education after high school. The change to VEAP may make veterans less likely to take advantage of their benefits in the future. Also, by this time they are predicted to spend one and a half years in college, and almost that much even if they don't serve. So if a soldier takes advantage of the military benefits for a two year program, it is much more likely than in the past that the soldier would have attended that program without the military aid.

(Table 8) Predicted Outcomes of the Education Model for Specific Cohorts, Including Insignificant Effects

	WWII	Korean War	Peacetime 1955-1964	Vietnam War	Peacetime 1975-2001	Iraq War
White Male Civilians	11.11	12.12	12.79	13.36	13.17	13.24
White Female Civilians	11.56	12.14	13.00	13.52	13.43	13.79
Non-White Male Civilians	9.60	10.88	11.93	12.72	13.22	13.27
Non-White Female Civilians	10.05	10.90	12.14	12.88	13.48	13.82
White Male Veterans	12.15	12.77	13.25	12.88	13.33	13.65
White Female Veterans	13.57	13.63	13.96	14.32	14.04	14.32
Non-White Male Veterans	10.62	12.14	12.95	13.30	13.14	13.62
Non-White Female Veterans	12.05	13.00	13.66	13.94	13.85	14.29

The coefficient on women in the WWII cohort is significant and positive, which suggests that after WWII women tend to be more educated than their male cohorts, and the mean values for women from these periods confirms this result. Of the observations of the WWII cohort the mean woman had approximately half a year more of education than the mean man. However, this drops quickly in the Korean War cohort and continues throughout the following regressions at a similar level which makes the coefficient appear to be an effect unique to the WWII cohort. Since the literature suggests that WWII veterans were the more educated part of the population, their absence would make women appear more educated in relation to the baseline of white males, and their return would mitigate this effect. This explains most of the variation, however the continued difference throughout periods where the literature does not offer continued support of this assumption (particularly in Vietnam) suggests the educational benefits did have a significant effect.

Within the sample of people in the Post-Korean era, women gain a 90% statistical significance level .2 year increase in educational attainment over men. This is only slightly higher than the previous period. The sample size changed from 1,538 women to 2,544 in the Post-Korean era, to 5,070 women in the Vietnam era which may explain why the magnitude is relatively stable but the significance of the coefficients increase throughout these periods. This also suggests that the educational attainment of women has increased at the same rate as the educational attainment of men throughout these periods. In the Post-Vietnam era women's attainment increases above that of men by about a tenth of a year, and the detriment to being married for a woman as compared to a man falls by a tenth of a year resulting in a sudden .2 year rise in women's educational attainment followed by about a quarter of a year in the Iraq period.

Since the rise in attainment is so sudden, and both of these increases happen during periods in which the surveys were being taken, this suggest that women may decide to pursue an education earlier than men do, giving the appearance of increased educational attainment overall as opposed to men. There may be alternative explanations as for this rise, such as the success of feminist movements and culture changes that result in the opening of more college opportunities for women in a broader range of fields. This serves as a baseline for women in the military, the category we are truly interested in.

In WWII, women in service are predicted to have 2 years of increased educational attainment by nature of having served in the military. This number seems extreme until we consider that over 12,000 nurses served on active duty in WWII

(U.S. Army, online). Since most of the other women in the army weren't serving on active, and nurses required additional higher education, it is likely that the much higher education experienced by women in this period is due to the high percentage of nurses that served in the military. There could be a number of nurses that were accepted without nursing degrees due to the high demand and low supply, but that the military would have a high demand for nurses would cause a selection bias for women with higher educational levels.

As the periods progress, the higher level of education that women in service receive falls from .96 in WWII to .44 in Post-Vietnam. This doesn't make sense initially as women were allowed into many more occupations in the military as the century progressed. However, during Vietnam there were approximately 5,000 nurses and almost 4,000 serving in 1980, of which almost 95% held Baccalaureate degrees or higher (U.S. Army Online). Since the relative number of nurses has decreased since the army has accepted more women in different positions and at the same time there has been a decline in the educational attainment of women who have served in the military relative to male soldiers, this may simply suggest a declining percentage of nurses among the female veteran population. However, the educational attainment of women as predicted by the model has been increasing over time. It wouldn't be implausible to assume that the G.I. bill still has a substantial effect on women. Also worth mentioning is that percent of women that serve on active in the military rises from 3 percent to 13 percent between Vietnam and the Post-Vietnam period, we may assume that they are not mostly nurses.

The coefficient of non-white for the general population shows a strong history of improvement in educational attainment. From a year and a half behind in WWII, when segregation is still a very restrictive factor, to being significantly more educated in the post-Vietnam era. This result is surprising, but likely aided by the increased number of Hispanic observations over time. In WWII, the NSV sample of Hispanic observations is about 3% by Iraq it increases to almost 14%. Since their overall mean in the NSV is about 11 years of education, as compared to both white and non-white educational means being closer to 13 years, and the Hispanic observations are coded by the CPS as white unless they are of mixed-race, this would cause a large apparent increase in the non-white educational coefficient over time, which is what we observe. In 1940 1.4% of the United States population was of Hispanic origin, by 1970 4.7%, 1980 6.4% and by 1990 9% of the population was Hispanic (U.S. Census). Although this likely accounts for a large portion of the effect of non-white educational attainment over white male attainment, their predictions still increase dramatically from 9.6 to 13.3 years of education. The outcomes increase by almost a year from Korea to Post-Korean eras and from Post-Korean to the Vietnam Era. During those times the increase in the Hispanic population was relatively small, which allows us to confidently attribute that change to the amelioration of the level of privilege of non-white Americans.

In WWII service in the military has an insignificant effect for non-white education, perhaps because G.I. benefits didn't offer southern non-whites any benefit, and the northern non-whites were either already bound for college or chose not to go. There is also the possibility that benefits weren't as openly extended to non-whites. In

Korea however, service had a highly positive effect on non-white soldiers. According to the NSV, Hispanic observations only varied by about 2% between WWII and Korea; this relatively small change should not explain the sudden change in educational attainment. Perhaps non-white veterans were more able to take advantage of the educational benefits, or perhaps they started enlisting with the intent of taking advantage of the educational benefits. Either way the G.I. Bill had a significant impact on the educational choices of non-white soldiers. After Korea we see a steep decline in the educational coefficient of service that coincides with the increased population of Hispanics as well as the increased educational attainment of non-whites outside of the military. The sign of the coefficient on non-white and non-white interacted with service are, with the exception on WWII when one is insignificant, always the opposite sign. This supports the theory that the G.I. Bill is more effective for underprivileged groups.

By the Iraq War, women, non-white and non-white service effects are all insignificant, either because of the reduced time before sampling or the reduced sample size. It is unlikely that these effects will all be measured as insignificant if sampled after the Iraq and Afghan wars are over. However that remains to be seen.

I find that service consistently increases educational attainment despite the literature saying that service itself is detrimental, which suggests that educational benefits are the cause of increased attainment. I find that non-white veterans, after a period where they are unable to take advantage of benefits, also see an increase in educational attainment due to service that is greater than the benefit received by white veterans until their civilian predicted attainment is even with white males, when their

service related benefit becomes equal to that of white male soldiers. Women have a high increase in educational attainment in the first two periods, probably due to the number of enlisted nurses; however the increase to education from their female civilian cohorts remains above the increase for white males, suggesting that service consistently helps women more than men.

Earnings Analysis

Using OLS analysis I estimated the equation:

$$\begin{aligned} \text{Earnings} = & \text{Constant} + \beta_1 \text{Education} + \beta_2 \text{Years in College} + \beta_3 \text{Women*Years in} \\ & \text{College} + \beta_4 \text{Non-White*Years in College} + \beta_5 \text{Age} + \beta_6 \text{AgeSquared} + \beta_7 \text{Rural} + \\ & \beta_8 \text{South} + \beta_9 \text{Women} + \beta_{10} \text{Married} + \beta_{11} \text{Women*Married} + \beta_{12} \text{Service in Period} + \\ & \beta_{13} \text{Women*Service} + \beta_{14} \text{Non-White} + \beta_{15} \text{Non-White*Service} \end{aligned}$$

The construction of this analysis was built identically to the educational analysis with the exception of education being used as an explanatory variable with a nonlinear specification. I hypothesized that college education should be a cutoff point for a very distinct effect from pre-college education. Originally I included an education-squared variable in place of Years in College. When replaced, the r-squared of the regressions did not uniformly change up or down. However that would make it difficult to measure the differing effect of higher education on women and non-white observations, which I have interacted with Years in College to find many highly significant coefficients.

(Table 9) Means of Sample Used for the Wage Regression Analysis (CPS)

	Wages	Education	Women	Age	Non-White	Married	# Observations
WWII	31039	12.39	0.02	69.09	0.10	0.78	14414
Korea	45794	12.79	0.02	61.66	0.11	0.81	26124
Post-Korea	53959	13.33	0.03	56.60	0.12	0.79	39248
Vietnam	57906	13.63	0.03	50.59	0.14	0.77	128794
Post-Vietnam	50593	13.45	0.13	38.25	0.18	0.66	105020
Iraq	48421	13.72	0.16	35.69	0.20	0.61	6776

(Table 10) Mean of War Veteran Wage Sample (CPS)

	Wages	Education	Women	Age	Non-White	Married	# Observations
WWII	30519	12.80	0.02	69.35	0.07	0.80	7207
Korea	46642	13.08	0.02	61.78	0.09	0.82	13062
Post-Korea	54600	13.52	0.03	56.69	0.10	0.80	19624
Vietnam	57282	13.76	0.03	50.68	0.12	0.76	64397
Post-Vietnam	49184	13.47	0.13	38.23	0.19	0.66	52510
Iraq	50482	13.92	0.16	35.65	0.21	0.64	3388

(Table 11) Means of Non-War Veteran Wage Sample (CPS)

	Wages	Education	Women	Ages	Non-White	Married	# Observations
WWII	31559.19	11.99	0.02	68.82	0.14	0.76	7207
Korea	44946.86	12.49	0.02	61.55	0.14	0.80	13062
Post-Korea	53317.62	13.14	0.03	56.51	0.15	0.79	19624
Vietnam	58529.77	13.51	0.03	50.51	0.16	0.77	64397
Post-Vietnam	52001.98	13.44	0.13	38.27	0.16	0.66	52510
Iraq	46360.47	13.52	0.16	35.73	0.19	0.58	3388

A majority of the information provided in the education regression section is still applicable to the tables here, except the earnings tend to be higher. In WWII we have very low mean earnings for education analysis, only \$6462. This is clearly due to age selection. Since the average age is 73 years old most of these observations are likely to be retired and not working for a wage or salary at all. Those who still choose to work will earn much more than retirees, however they will also likely be the ones who still have to work, and therefore earn less. Only those observations still working are included in the positive earnings sample, which is likely why the mean age fell 3 years.

(Table 12)

Results for Earnings Regressions For 6 Cohorts in the United States

	WWII	Korean War	Peacetime 1955-1964	Vietnam War	Peacetime 1975- 2001	Iraq War
Years of Education	1122.61 *** 7.26	1771.77 *** 12.49	2284.09 *** 13.87	2792.21 *** 26.14	2919.08 *** 21.21	2051.37 *** 3.96
Years in College	4058.84 *** 16.66	4572.11 *** 21.88	4856.18 *** 22.30	5029.33 *** 37.06	5399.39 *** 31.57	5690.88 *** 8.96
Women*College	-2036.13 * -1.87	-2914.93 *** -2.84	-1614.68 *** -2.70	-3277.44 *** -8.33	-3109.17 *** -15.41	-629.48 -0.99
Non-White*College	-1247.37 *** -2.44	-528.72 -1.50	-389.51 -1.25	-777.00 *** -4.42	-809.97 *** -4.52	-335.58 -0.57
Age	-12264.67 *** -14.99	-1756.00 *** -2.67	5214.47 *** 14.99	5366.43 *** 28.33	3682.08 *** 21.52	2670.33 *** 6.11
Age squared	81.92 *** 14.14	4.93 0.96	-50.19 *** -16.69	-51.62 *** -27.78	-36.66 *** -16.88	-24.75 *** -4.53
Rural	-7043.11 *** -9.75	-9512.54 *** -16.05	-10762.85 *** -19.33	-10906.12 *** -34.47	-8678.05 *** -25.71	-4617.93 *** -3.48
South	-1194.89 * -1.77	-1310.17 ** -2.40	-1345.31 *** -2.67	-1005.03 *** -3.47	-1448.87 *** -4.91	280.66 0.27
Women	-5320.59 -1.43	-4340.91 -1.14	-7209.60 *** -2.65	-4295.89 ** -2.48	-5044.15 *** -5.92	-10985.33 *** -4.05
Married	4873.49 *** 6.29	8264.25 *** 12.68	10650.34 *** 17.91	12919.20 *** 40.49	12564.57 *** 39.75	11643.41 *** 9.83
Women*Married	2922.26 0.66	-14218.24 *** -3.60	-15294.00 *** -5.65	-15407.61 *** -9.16	-15381.64 *** -18.41	-12408.27 *** -4.47
Service In Period	-2412.11 *** -3.64	1096.45 ** 2.02	-45.51 -0.09	-1281.36 *** -4.38	-1326.39 *** -4.13	1129.83 0.94
Women*Service	-2727.07 -0.61	856.97 0.22	1963.41 0.73	1080.82 0.66	1981.03 ** 2.42	8243.62 *** 3.00
Non-White	-1969.18 -1.44	-4516.91 *** -3.98	-8120.31 *** -7.67	-7937.96 *** -13.11	-7000.43 *** -11.26	-5545.13 *** -2.60
Non-White*Service	3213.30 1.53	-390.87 -0.24	3922.36 *** 2.73	2094.46 *** 2.71	1472.62 ** 2.05	-629.28 -0.25
Constant	464087.10 *** 16.13	101555.50 *** 4.82	-120954.30 *** -11.90	-131272.40 *** -26.69	-84374.13 *** -23.24	-55619.54 *** -5.45
Adjusted R ²	0.14	0.17	0.17	0.18	0.20	0.22
# Observations	14414	26124	39248	128794	105020	6776

*90% Confidence ** 95% Confidence ***99% Confidence

In Table 12, the number of observations for each regression is substantially changed from the education regression, especially in the WWII and Korea cohorts, where many of the members of these cohorts have exited the labor force by the time the surveys were taken. But the sample size is quite large even for the smallest samples which will help reduce the standard error of the coefficients. The adjusted r -squared values of these regressions are much higher than for the education regressions, perhaps because the earnings data as well as the descriptive variables are current, and apparently because the available explanatory variables do a better job in this case of explaining the variance in earnings. Current age, for instance, will have a more significant effect on current earnings than age would on education fifty or more years after being educated. But in the education regressions, age represents cohort effects of educational attainment rather than for chronological age.

Because of the selection effect of high rates of non-workers associated with the WWII cohort it is hard to compare the magnitude of the coefficients with the following periods. For this reason, when generalizing about trends I will often ignore the insignificant results and the inconsistent magnitudes revealed by the WWII earnings regressions.

Control Variables

The analysis reveals the same directional effects on annual earnings for age, age squared, rural and married as they have on education. The linear and non-linear component of age switch over time, for people living in rural areas their cohort outcomes improve over time and men have a distinct benefit from being married. This effect may be due to optimizing income behavior. If a married person earns less than

their spouse, the couple may choose to have the lower earner spend more time helping their children or tending the home since out of the combined couples' time, time spent working is more efficient when done by the highest earner. Since women consistently earn less than men, it would make sense that marriage would increase the earnings of male observations more often.

This hypothesis is also consistent with the coefficient of married women, where unlike in the educational attainment regressions, marriage has a large negative effect on earnings. If men decide to work more, women correspondingly must work less since marriage presumably requires a larger commitment at home when raising a family. This coefficient decreases over time, which is also consistent with possible cultural changes of women gaining more opportunity in the workforce as well as men being more accepted as homemakers and stay-at-home dads.

The coefficient on the variable south shows a different trend than we see in education regressions where the level of attainment converges; instead earnings seem to be slightly more divergent over time. If we consider the education-earnings effect, the negative effect of living in the south does shrink over time; however there does seem to be a distinct earnings disadvantage of living there. This may be due to lower costs of living allowing employers to pay lower nominal earnings, or the different types of jobs that are available in the South.

The coefficient on years of education is consistent over time. The significance of the coefficient varies directly with sample size and also cohort age; there is an increase for cohorts with more of an unretired population and then a decrease in the

most recent cohort this may suggest that experience has some interaction with pre-college education since its effects are mostly seen on primarily middle aged samples.

Primary Independent Variables

The coefficient on years in college implies that the value of college has increased over time, or, alternatively, that the detrimental effect of not going to college has increased over time since baseline earnings have been decreasing as returns to education rise. If we ignore both the WWII and the Korean War cohort coefficients, we see that this trend is consistent until the Iraq War. This decline in the Iraq War cohort may be due to the recent financial crisis, which could cause younger persons to have more trouble finding preferred work and become underemployed; any full-year unemployed observations would be dropped from the sample, and since it is less likely that low income candidates are under-employed this effect would be reflected as a decline in the value of education. Further research would be required to make such a hypothesis substantiated.

The coefficient on military service in most cohorts is quite small. It is either negative or insignificant, which is consistent with a body of literature that suggests the bridging effects of the military are insufficient, and that education is the most beneficial benefit to military service. The predicted outcome of men in service always exceeds the outcome of those who did not serve. This implies that no matter what G.I. Bill was served under the increased educational attainment caused by military service more than equalizes those who serve as compared to their cohorts. This change is relatively small, ranging between one and four thousand dollars. However when that is considered per year it is a significant change in outcomes.

The coefficient on women is consistently around \$5000 lower than men, except for two outlying periods. In the Post-Korean period women's outcome suddenly fall an extra \$3000 relative to men, although this change may seem low their returns to education increase at the same time by a sizeable amount, \$1300 per year. That leaves a question as to why these numbers return to Korean War cohort levels in the Vietnam War cohort. Similarly the Iraq War cohort has a women's coefficient decrease of \$-5044 to \$-10985, but an increase in educational return of over \$2500 a year. To clarify these changes I have included a table below (Table 9) which uses the results of the education regression, as well as the means of the sample, to provide basic predictions for each group.

(Table 13) Predicted Outcomes of the Earnings Model for Specific Cohorts, Including Insignificant Effects

	WWII	Korea	Post-Korea	Vietnam	Post-Vietnam	Iraq
White Male Civilians	20051	33980	46443	52278	47526	42351
White Female Civilians	15240	29361	39102	44253	40223	34476
Non-White Male Civilians	16384	26734	32504	38771	40016	36631
Non-White Female Civilians	11573	22427	26176	32719	32321	28552
White Male Veterans	19412	39209	49668	47254	47599	46655
White Female Veterans	15535	36424	46324	47654	44067	47634
Non-White Male Veterans	18340	29676	42966	43673	39552	39686
Non-White Female Veterans	11926	28842	39827	38599	36044	40461

Much of the variation we see in the predictions is common across groups, so it is reasonable to attribute common changes to macroeconomic factors such as employment rates, age groups and cultural changes. Therefore I will focus on the differences between each group. Since Korea women have been consistently \$7000 behind men in predicted earnings. This would suggest that the earnings paid to

women haven't been affected much over time, and that the measure of privilege of women has remained constant and below that of men.

The coefficient for women in service is large in magnitude, yet entirely insignificant until the Post-Vietnam Era. This suggests that women receive the same magnitude of benefits and detriments to service, despite the differences in their positions. This is also a surprising result because it doesn't demonstrate a large change due to the composition of female nurses gaining experience working in likely the most experience developing opportunity a nurse could achieve, nor does it reflect the bridging effects that are specific to women. The bridging effect was postulated to include learning to work in chauvinist organization and developing the skills that are valued by a male dominated civilian workforce. In the Post-Vietnam period the coefficient on Women in Service suggests that women do not suffer the detrimental effects of serving in the military that men do.

There is a sudden rise in value of serving in the military for women in the Iraq War period. This is likely due to the huge \$-10,985 women coefficient that is hard to justify, not having the same effect on women in the military. If we didn't see that \$6,000 one period change on the coefficient of women the women service interaction term would be a very similar magnitude to the previous period. However, women in the military in the Iraq War cohort are also the most educated group in the sample. Since the shock that affects women also seems to have an effect on men's earnings and men in service see a slight predicted decline, women in service are suddenly the highest predicted earnings group. This suggests that perhaps women in the military are more robust to shocks in the civilian population with earnings returns higher than

they were in Vietnam, although that earnings bump was statistically insignificant. The striking effects during Iraq require further research before any definitive conclusions may be made.

Non-white earnings have been rapidly closing the gap between their earnings and white male earnings. However, as described in the education results chapter, this may be the result of a changing population of Hispanics coded in the white population. However, using women as a baseline we still see a convincing effect of non-white observations becoming less underprivileged over time at least compared to the privilege of women.

The returns to college for non-white observations are only marginally lower than that of their white cohorts. As is consistent with the literature, their returns to education are significantly lower than white observations in the WWII cohort. The returns following WWII are only slightly lower if not insignificantly different. This result suggests that non-white observations tend to receive similar benefit to education as white observations and most of the downwards effect of being non-white is due to being underprivileged.

If we look at the coefficient for the effect on non-white service on earnings, with emphasis on the periods after Korea when enlistment was higher and military segregation was diminished, we see an inverse relationship between service and privilege. As the coefficient on non-white changes from \$-8120 to \$-5545, the coefficient on non-white service changes from \$3922 to an insignificant negative value, military service benefits most those who have the most to gain. This suggests that non-white citizens have made more progress over the past 60 years than women

have. However, non-white predicted outcomes are still considerably lower than the other groups considered.

The NSV also provides some qualitative questions which shed light on some of the rising problems with VA benefits. 9% of the sample of WWII veterans claims they haven't taken advantage of educational benefits because they were not aware that they had any. This number rises to a high of 25% in the Post-Vietnam period, and 21% during the Iraq War. This means that up to one in four soldiers claims they are unaware of the G.I. Bill educational benefits that they could receive. 7% of the Post-Vietnam sample claims that the reason they didn't take advantage of the benefits they would have received is that they did not pay into the training funds that were required for them to take advantage of educational benefits.

Conclusion

This thesis begins to suggest several very important topics to be explored when considering the condition of non-white and women citizens of the United States and how they are treated by the Armed Forces. Because of data limitations the results are not definitive, but highly suggestive. This paper also reinforces several studies that already have basic findings on the returns to service.

Over time educational subsidies have changed to make the program more complex and inaccessible, such as buy-in programs, as well as making any schools other than in-state public schools less accessible due to the size of the subsidy and the rising cost of schooling. The VEAP introduced a buy-in program to educational

benefits, which resulted in 7 percent of veterans failing to pay for the benefits they would have taken advantage of according to the NSV questions. It is plausible that the complexity of the program, as well as requirements to pay for benefits could have caused the rise from 9% of veterans not knowing their eligibility for educational benefits to over 20%. In addition, the coefficients on returns of service on education, as well as the coefficients of returns from service on earnings show a downward trend of outcomes that are likely attributable to the decline of veterans benefits.

To more convincingly show this decline, the largest obstacle to my analysis was the increasing number of Hispanic observations in my white sample. Since they tend to be the least educated and perhaps have the worst outcomes of any non-white group, their increase could have biased my results. In addition, as a rising portion of the population, and perhaps the most underprivileged an essential expansion of my research would be to include Hispanic observations as a third group and measure the effect of the G.I. Bill on their educational outcomes. Also with the 2011 NSV data it would be possible to measure the usage of the G.I. Bill more accurately for each group. To fully take advantage of the variables however it would be helpful if the government would agree to divulge the wage variables included in the survey and then the data could be matched and either sampled to weight, or weighted against, the civilian population.

Joining the military does provide an advantage in terms of education, which does exceed the cost of service. Since higher education has become much more prevalent in the population, and returns to earnings due to service are insignificant or negative, instead of having higher outcomes than their cohorts as my results and the

literature suggests they did in WWII and Korea, recent white male veterans are now at an insignificant earnings advantage due to their educational benefits.

The hypothesis for the results of changing educational benefits for veterans are supported by the presented results, but there is more work to be done before they can be convincing. The changing cultural views of education cause the population to also increase their educational attainment outside of the military which shrinks the effect of military service. To measure if the military really does increase outcomes, it is necessary to have pre-educational variables that have a higher explanatory significance on education, so that we may more accurately predict soldiers attainment if they were unable to serve in the military, such as average childhood family earnings, which would help control for selection issues.

I have also found that coming from a more privileged group decreases the usage of educational benefits. Except in periods where segregation impedes the usage of veteran's benefits, female and non-white samples consistently seek more education when they are in the military than white males do as compared with their civilian cohorts. This suggests that the military may be an equalizing force for these groups. Perhaps since white observations more often have the choice to go to college or serve in the military, they are less likely to choose to go to the military if they have the intent of going to college. If less privileged groups cannot make that clear choice and go to the military, they are then presented with an option that they did not have previously.

This explanation is more consistent with the non-white outcomes, which is logical, since women do not suffer the economic discrimination from birth that would

be more likely in non-white citizens. Instead discrimination against women is based purely on the effects of their gender. With respect to their gender outcomes in earnings and education, as well as their returns to college discrimination against women has remained relatively consistent throughout the past 60 years. The sole exception is their returns to service.

The cause of the significant positive coefficient of women's return to service being beyond that of white male veterans is partially due to the benefits of the G.I. Bill and partially due to the unequal distribution of jobs between men and women in the military, specifically professions which may require an advanced degree such as nursing. However these effects are most prevalent in WWII, and should be a significant effect due to the increase of MASH units in Vietnam. Since that result is not seen, and we see earnings increases in Post-Korean as well as the Iraq War periods that cannot be explained by this phenomenon, there must be another explanation for why when earnings outcomes fall for the civilian population women in service are robust to these changes. This could be due to childrearing and birth factors or perhaps due to the career choices of women who have served in the military. The answer to that question requires further study. However, since most of these changes would expect a negative coefficient, we can be fairly certain that women are more prone to using the benefits provided by the G.I. Bill.

An important factor to consider is the returns to education in these groups. The results appear to show that privileged groups have higher returns to education. This seems reasonable however, we must also consider that more privileged groups tend to attend higher ranking institutions, and that returns to schooling may be

capturing some of the effect of privilege. The more privileged an observations racial and gender cohorts are the lower the percentile that observation will be in for the years of college that observation chooses not to attend. In that light some of the returns to education we see being higher for more privileged groups is simply the result of not being able to control for privilege beyond racial and gender distinctions.

My analysis leaves a considerable amount of data collection and analysis to be done. A significant number of the questions, specifically the questions about abnormal values for the Iraq War, will require time to collect post-Iraq data that can be compared with the results presented here, as well as more data on racial and gender distinctions. If this paper were to be repeated with variables for pre-education and service predictors of outcomes, as well as more complete variables for Hispanic and occupational outcomes, while controlling for child related issues, the results of that paper would justify the framework that has been created here and more conclusively answer the questions posed here, while hopefully confirming the results.

There are also several new topics left open for consideration. I suggest a study of the racial factors that affect whether or not individual veterans are aware of the benefits that they have earned. In honor of the veterans of our country, and for the sake of fairness it is morally imperative that the rewards we give to our veterans are not lost due to a lack of information.

The G.I. Bill and its effects are a unique way to look at discrimination in the United States. The unique nature of having several different test periods with different rules and compositions of observations poses considerable challenge to the researcher. However with significant controls it also presents one of the largest

educational programs in the United States with a great potential for analysis. Since the military treats its members in a rigidly similar fashion for a period of years, it provides researchers with an enormous sample of Americans from diverse backgrounds, who have all shared a similar potential in terms of wages and training. When these soldiers re-enter society they are also given similar benefits. It is almost impossible to construct such an equalizing laboratory test involving race and gender. The military is a source of data with a very large potential for innovative study of discrimination that has barely been used, let alone exhausted.

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