Estimates of the Willingness-to-Pay to Avoid Military Service and Fatality Risk: Evidence from the Vietnam Draft

Chris Rohlfs
22 April 2005

Abstract

In this note, the effects of the Vietnam draft on college attendance are compared to the effects of tuition on college attendance. Through this comparison, it is possible to express in dollar units young men’s willingness-to-pay to avoid conscription. In 2003 dollars, it is estimated that young men were willing to pay $10,000 to $35,000 to avoid being drafted. Fatality risk is one of many reasons why young men avoided the draft. If we assume it was the only reason, then we can obtain an upper bound for the value of a statistical life. The upper bound obtained ranges from $1.1 million to $4.0 million. This upper bound is on the low end of current estimates of the value of life.

JEL Classifications: H56, J17, J45, N42, N32, I20, H57, H29

1 Department of Economics. University of Chicago. 1126 E. 59th St. Chicago IL. 60637. email: car@uchicago.edu

2 Thanks to data provided by Dan Amon at the US Selective Service System. Thanks also to Orley Ashenfelter, Gary Becker, David Card, Michael Greenstone, Steve Levitt, Dimitriy Masterov, Casey Mulligan, Kevin Murphy, Tim Perri, and seminar participants at the University of Chicago for helpful comments. This research was made possible in part by generous support by the National Institute for Aging. Thanks
Once again, the draft has emerged as a topic of public discourse (Dao, 2004). It is highly unlikely that a draft will be enacted in the US in the near future. However, the US military’s “stop-loss” policy in Iraq has non-voluntary elements and has been described by some as a “backdoor draft” (Archibold, 2004). Moreover, the majority of countries in the world continue to procure troops through the draft (Mulligan and Shleifer, 2005). From a public policy standpoint, it would be useful to know exactly how much of a burden conscription places on young men.3

In addition to providing information about conscription risk, this note contributes to the large and growing literature on individuals’ valuation of fatality risks. Reliable estimates of the value of a statistical life are a crucial ingredient in determining whether specific life-saving public expenditures improve social welfare. As some previous researchers have argued, conventional approaches to estimating this value may suffer from misspecification and publication bias (Ashenfelter and Greenstone, 2004b; Black and Kneisner, 2003). This note proposes a new method to obtain an upper bound on the value of a statistical life that may mitigate these concerns.

Two common concerns with value of life estimates are exogeneity of the choice and knowledge of risk. Job-specific fatality risk may be correlated with worker productivity, thus biasing labor market estimates of the value of life. This study exploits year-to-year changes in the risk of being drafted to disentangle the effects of fatality risk from person-specific characteristics. Moreover, deaths in Vietnam were well-publicized, and the fatality rate for

---

3 One other study estimating the cost of non-voluntary military service is Oi (1967). Oi (1967) uses a rough estimate of a military labor supply curve to estimate the taxes imposed on draftees and “reluctant volunteers.” In 2003 dollars, Oi estimates that the draft imposed a tax of $19,000 per reluctant volunteer. He also presents a lower bound of $36,000 for the tax imposed on the average draftee. Given that Oi’s figure is a lower bound, his estimate is somewhat higher than the figures presented in this note. However, Oi’s estimates rely upon very strong assumptions about the nature of labor supply. Oi does not describe the data used in his calculations. Klotz (1970) asserts that Oi’s supply curve regression relies on only 9 regional observations. Klotz also suggests that Oi neglects to control for many possible sources of bias.
Vietnam was similar to the fatality rate during the recent Korean War. Hence, young men probably had a good idea of what the risks were when they made their choices.

Figure 1: Demand for Education and the Effect of the Vietnam Draft

In one innovative study, Card and Lemieux (2001) use females as a comparison group to estimate the effect of conscription risk on education. The authors find that, during the Vietnam draft, American males’ college attendance increased considerably relative to females. They find that this education response varied systematically with year-to-year variations in the risk of conscription. Hence, young men made costly changes in their behavior in order to avoid conscription. The purpose of this note is to measure the dollar cost of these changes in behavior. Figure 1 illustrates the basic intuition for this note. A sizeable literature exists measuring the effect of tuition on college attendance. Building on these studies, it is possible to plot a demand curve for college education, as shown in Figure 1. The Vietnam draft increased schooling by a measurable amount, call it $Q'' - Q'$. Given this demand curve, we can estimate $P' - P''$, the tuition subsidy required to generate a $Q'' - Q'$ increase in schooling.4

---

4 In addition to this price effect, conscription risk also decreased young men’s lifetime utility. If this decrease were large, it might have also decreased demand for schooling – due to an income effect. However, this effect was probably very small compared to lifetime income. Moreover, this one-time shock to utility did not affect liquidity. Hence, the income effect of the draft on schooling was probably negligible compared to the large “price effect” of student deferments.
Suppose that, during the Vietnam era, young men were willing to pay V\text{avoid draft} to avoid being drafted. For simplicity, suppose that this value was constant.\textsuperscript{5} Next, let us suppose that a given individual was willing to pay V\textsuperscript{i school} to attend school.\textsuperscript{6} Suppose too that some individuals were not subject to the draft, while others faced a draft probability \( \pi \). Among individuals not subject to the draft, the maximum tuition each individual was willing to pay was V\textsuperscript{i school}. Among those subject to the draft, the maximum tuition individuals were willing to pay was V\textsuperscript{i school} + \( \pi \cdot V\text{avoid draft} \). That is, individuals subject to the draft enjoyed an additional benefit of attending school – it shielded them from the draft. This additional benefit \( \pi \cdot V\text{avoid draft} \) increased schooling levels – much like a tuition subsidy would. In this simple model, young men regard the tuition subsidy \( P' - P'' \) as equivalent in value to \( \pi \cdot V\text{avoid draft} \). The willingness-to-pay to avoid the draft can then be measured as:

\[
V\text{avoid draft} = \frac{(P' - P'')}{\pi}.
\]

This note uses a different measure of \( \pi \) (conscription risk) than Card and Lemieux (2001) do. Card and Lemieux are interested in the total effect of the draft for an entire cohort. Consequently, they measure the cohort-specific probability of serving in the military (being drafted or enlisting). The focus of this note is annual tradeoffs that young men faced between two specific options. The first option was to register with Selective Service without requesting any specific exemptions or deferments. Individuals who did this were at risk of being drafted.\textsuperscript{7}

\textsuperscript{5} In actuality V\text{avoid draft} is probably not constant, and it is likely to be correlated with V\textsuperscript{i school}. If this correlation is zero or positive, then the estimates in this paper overstate the willingness-to-pay among men who did not attend school. That is, men who willingly face conscription risk have revealed that their willingness-to-pay to avoid conscription risk is less than \( P' - P'' \).

\textsuperscript{6} Young men may have faced credit constraints that lowered their actual willingness-to-pay to attend school. The estimates in this note should be interpreted as willingness-to-pay given that credit constraints exist.

\textsuperscript{7} Men who pursued this first option were classified as “Available for Military Service,” or they were placed in “Holding Classification.” Among men pursuing this first option, the annual conscription risk averaged 0.05 from 1961 to 1965 and 0.14 from 1966 to 1973. However, the affected population increased considerably in 1970 and 1971 as many exemptions were eliminated. After weighting by the size of the affected population, this risk averaged 0.05 from 1961 to 1965 and 0.08 from 1966 to 1973. The annual conscription risk was approximately zero.
The second option was to attend school and face an annual conscription risk of zero. Some men were able to obtain exemptions and did not have to face this tradeoff. Other men chose to enlist rather than face this tradeoff. Both categories of men are excluded from the “affected population” considered in this note.8

Card and Lemieux (2001) use two different approaches to estimate the effect of the draft on enrollment. In the first approach, the authors note a large increase in the ratio of male to female enrollment rates that coincided with the Vietnam War. They assume that the ratio of college enrollment rates between men and women would have declined linearly in the absence of the draft.9 In the second approach, the authors regress the ratio of male to female enrollment rates on males’ conscription risk and a linear trend. For the calculations shown below, the excess enrollment due to the Vietnam War is estimated using both approaches.

Estimates of the Willingness-to-Pay to Avoid Military Service

Table 1 shows the empirical results from this note. In Columns (1) through (3), the effect of the draft on education is estimated using Card and Lemieux’s first approach – the linear interpolation. In Columns (4) through (6), this effect is estimated using their second approach, where conscription risk is a regressor. Columns (1) and (4) show estimates for all races. Columns (2) and (5) show estimates for white men, and Columns (3) and (6) show estimates for black men. Row 1 of Table 1 shows estimates of the number of men who were induced to attend in 1974 and was exactly zero from 1975 onward. When conscription risk is computed using the unweighted means, smaller estimates are obtained for the willingness-to-pay, ranging from $5,000 to $17,000. “Holding Classification” includes individuals whose ages or lottery numbers placed them outside of immediate conscription risk. Angrist and Krueger (1992) find that lottery numbers did not dramatically affect individuals’ schooling decisions – possibly due to the timing of the lottery. If these individuals are excluded from the “affected population,” slightly higher willingness-to-pay estimates are obtained, ranging from $18,000 to $58,000. “Holding Classification” includes individuals whose ages or lottery numbers placed them outside of immediate conscription risk. Angrist and Krueger (1992) find that lottery numbers did not dramatically affect individuals’ schooling decisions – possibly due to the timing of the lottery. If these individuals are excluded from the “affected population,” slightly higher willingness-to-pay estimates are obtained, ranging from $18,000 to $58,000.

8 One problem with this approach is that the affected population may have changed depending on the annual conscription risk. When conscription risk is high, the men with the lowest willingness-to-pay to avoid military service are likely to enlist (and leave the sample). The willingness-to-pay estimates presented here may be biased upward for this reason. However, when these exempted and enlisted individuals are included in the “affected population,” much lower willingness-to-pay estimates are obtained.

9 In this counterfactual world, it is assumed that the induction rate would have declined linearly until the end of the draft in 1973.
school by the Vietnam War. To calculate this figure, we first measure the effect of the Vietnam War on the male-female enrollment ratio. The figure shown in Row 1 is this increase in the male-female enrollment ratio times (male population aged 18-29)*(female enrollment rate). Row 2 shows the “Size of the Affected Population.” This figure represents the number of draft eligible men plus the number of men who received college deferments. The figures in Row 1 and 2 are both measured in thousands. Row 3 shows the annual conscription risk for a young man who did not enlist or obtain a deferment or exemption. This figure is calculated as the induction rate for the previous fiscal year. The induction rate is calculated as the “Annual Number of Inductions” divided by the “Size of the Affected Population.” By combining Rows 1, 2, and 3, it is possible to estimate the “Effect of 100% Conscription Risk on Enrollment.” This figure is calculated as (Row 1 / Row 2)/Row 3. This figure – shown in Row 4 – is the percentage-point change in enrollment associated with a percentage-point change in conscription risk. Row 5 shows the percentage-point change in enrollment associated with a $1,000 tuition subsidy. The range shown in Columns (1) and (3) is representative of the literature, and is taken from Kane (2003). Estimates of the effects of tuition on enrollment for whites and blacks are

---

10 The Vietnam War is defined as the period from FY 1966 to FY 1973, when conscription risk was particularly high. Card and Lemieux (2001) consider enrollment for the subgroup of males aged 20-21. For the purposes of this study, enrollment is considered for the entire affected population – males aged 18-29. This enrollment rate is computed as the population-weighted sum of enrollment rates for four age groups: 18-19, 20-21, 22-24, and 25-29. However, the education effects of the draft are largely concentrated in this 20-21 subgroup. Data for enrollment rates taken from the Current Population Survey, 1960-1980. Ages 27-29 (who were generally not draft eligible) are included because enrollment data are not readily available for the 25-26 age bracket. Sample includes 21 years, from FY 1961 to FY 1981. Annual population estimates by age, sex, and race taken from the US Census Bureau.

11 Draft eligible men include men who were classified as “Available for Military Service” plus “Holding Classification.” “Holding Classification” described in footnote 7. Data Sources: Statistical Abstract of the United States, 1961-1977. Annual estimates of “College Deferments” provided by Selective Service System. Figures for whites and blacks assume that both races are represented in proportion to their fractions in the 18-26 population.


13 Kane (2003) includes a useful review of the literature on tuition subsidies. Kane suggests a consensus estimate that $1,000 in tuition subsidies increase college attendance by roughly 4 percentage points. The effects appear to be similar for males and females – and the consensus estimates have not changed dramatically over time. Stanley (2003) finds similar effects for male Korean War veterans in the 1960s and 1970s. One exception to these consensus estimates involves the introduction of the Pell Grant, a means-tested tuition subsidy. Kane (1995) suggests that the Pell Grant had low effects because may many low-income youths may have not known about it.
taken from Kane (1994). The willingness-to-pay to avoid conscription is calculated as $1,000 times Row 4 divided by Row 5. This figure appears in Row 6.

Across all races, it is found that the Vietnam draft increased enrollment by somewhere between 137,000 and 246,000. As Row 6 shows, this effect translates into an estimated willingness-to-pay between $10,000 and $35,000. For white men, the willingness-to-pay is somewhat higher – ranging from $30,000 to $53,000. And for black men, the willingness-to-pay is on the low end of this range – from $10,000 to $18,000.

An Upper Bound on the Value of a Statistical Life

One major reason why young men avoided the draft was to avoid fatality risk. Of the 1.7 million Americans who were drafted in the Vietnam Era, 0.88% were killed in action or died of wounds. If fatality risk was the only cost of conscription, then $V_{\text{avoid draft}}$ would equal 0.0088 times the value of a statistical life. Hence, by dividing the willingness-to-pay to avoid conscription by 0.0088, we can obtain an upper bound on the value of a statistical life. Given a range of $10,000 to $35,000 for $V_{\text{avoid draft}}$, this upper bound ranges from $1.1 million to $4.0 million per life.

In addition to the fatality risk, there were other major costs to being drafted. Draftees faced the risk of injury, and many experienced long-term post-traumatic stress disorder upon their return. Draftees were treated poorly, isolated from women, fed low-quality food, and forced to live in a tropical climate with poor living accommodations. Many young men had

---

14 The rough estimates presented here are unweighted averages of Kane’s estimated effects of tuition by income quartile for whites and blacks, respectively.
15 Some of the increase in enrollment is likely due to lagged effects of conscription risk. When 2 lags of conscription risk are included in the regressions (regression not shown), we obtained an estimated effect of 218,000. Hence, the total effect of conscription on enrollment is probably closer to the high end of these estimates.
16 Source: Statistical Abstract of the United States, 1976. Number of draftees counted as the total drafted in fiscal years 1966 to 1973 plus one half times the number drafted in 1965. These additional 1965 draftees are given one half weight to account for the deaths incurred during their remaining year of service (in 1966). Among these 1.7 million draftees, 15,200 died from 1966 to 1973.
moral objections to the war. In 2003 dollars, annual compensation was roughly $9,000 lower in the military than in comparable civilian occupations (US President’s Commission on an All-Volunteer Armed Force (1970), pg. 52.). After correcting for the 2-year wage differential, our upper bounds on the value of life range from -$1 million to +$1.9 million. Angrist (1990) finds that, as late as the 1980s, white veterans earned 15% lower wages than otherwise identical men who did not serve. Hence, the true willingness-to-pay to avoid fatality risk could be considerably lower than the upper bound presented here. Costa and Kahn (2004) estimate that, in 1970, an 18-30 year-old American man would pay $3.9 million to $7.0 million per life to avoid fatality risk. Ashenfelter and Greenstone (2004b) suggest that, due to omitted variables, citizens’ true willingness-to-pay to avoid fatality risk may be lower than current estimates. The evidence presented here appears to support this hypothesis.

Bibliography


17 However, it is likely that many potential draftees did not anticipate such a lasting negative wage effect.
18 Costa and Kahn’s estimates are fairly representative of the literature, as they show in the paper.
19 Using state-level voting behavior, Ashenfelter and Greenstone (2004a) estimate an upper bound of $1.5 million for the value of a statistical life.


### Table 1: Willingness-to-Pay to Avoid Conscription in the Vietnam War

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Linear Interpolation</td>
<td></td>
<td>Conscription Risk as a Regressor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All Races</td>
<td>White</td>
<td>Black</td>
<td>All Races</td>
<td>White</td>
</tr>
<tr>
<td>1. Annual Excess Enrollment Due to Vietnam War (1,000s)</td>
<td>246</td>
<td>219</td>
<td>25</td>
<td>137</td>
<td>122</td>
</tr>
<tr>
<td>2. Size of Affected Population (1,000s)</td>
<td>3,528</td>
<td>3,104</td>
<td>376</td>
<td>3,528</td>
<td>3,104</td>
</tr>
<tr>
<td>3. Annual Excess Conscription Risk Due to Vietnam War</td>
<td>6.7%</td>
<td>6.7%</td>
<td>6.7%</td>
<td>6.7%</td>
<td>6.7%</td>
</tr>
<tr>
<td>4. Effect of 100% Conscription Risk on Enrollment</td>
<td>105%</td>
<td>106%</td>
<td>101%</td>
<td>58%</td>
<td>59%</td>
</tr>
<tr>
<td>i.e., (Row 1 / Row 2)/Row 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Effect of $1,000 Tuition Subsidy on Enrollment (in 2003 Dollars)</td>
<td>3% to 6%</td>
<td>2.0%</td>
<td>5.5%</td>
<td>3% to 6%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Estimated Willingness-to-Pay to Avoid Conscription ($1,000 Times Row 4 Divided by Row 5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Estimated Willingness-to-Pay to Avoid Conscription (in 2003 Dollars)</td>
<td>$17,000</td>
<td>$10,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>to</td>
<td>to</td>
<td>to</td>
<td>$35,000</td>
<td>$19,000</td>
</tr>
<tr>
<td></td>
<td>$53,000</td>
<td>$18,000</td>
<td>$30,000</td>
<td>$10,000</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Annual Excess Enrollment Due to Vietnam War is the estimated number of youths induced to attend school because of the Vietnam draft. Size of Affected Population is the number of youths who, in the absence of student deferments, would be subject to the draft. Annual Excess Conscription Risk Due to Vietnam War measures how much the Vietnam War increased conscription risk for youths not in school. Data sources: 1960-1980 Current Population Survey (for enrollment rates); 1960-1980 US Census Bureau Population Estimates (for population by age and race); 1961-1976 *Statistical Abstract of the United States* (for draft-eligible population and conscription risk); Selective Service Administration (for number of college deferments); Kane (2003, 1994) (for effects of tuition on enrollment). Additional details in the text.