Do guns displace books? The impact of compulsory military service on the demand for higher education*

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Abstract

Compulsory military service is expected to have a negative impact on the demand for higher education through its effect on the returns to human capital investments. This latter impact is due to, among others, skill atrophy (i.e., the depreciation of human capital learned before military service), the acquisition of skills not relevant for the civilian labor market and the associated time lost during acquisition, and the forced delayed entry into the said labor market. To estimate the causal effect of conscription on the demand for higher education, we use the regression-discontinuity design of the military draft in Germany in the 1950s. The law which introduced conscription exempted men born before 1 July 1937 from military service while those who were born afterwards faced a positive probability of being drafted. In comparing these two groups, we find that military service has a negative but statistically insignificant impact on the probability of obtaining a university education.

JEL classification: I28, J24
Keywords: regression discontinuity, conscription, career interruption, skill atrophy

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1 Introduction

Conscription into the armed forces is still actively enforced in many countries. Typically, men are called around the time they are 18 years old for a medical examination, after which they will either be declared fit to immediately serve in the armed forces or exempted (temporarily or permanently) from service. Upon being drafted, these selected individuals are to serve in the armed forces for a specified period of time, usually for about one year. Military service is therefore a disruption of the human-capital-acquisition process which one undergoes either throughout the course of the formal educational system or within the labor market.

In several respects, this interruption is an important factor in an individual's demand for higher (i.e., tertiary) education. As Keller, Poutvaara and Wagener [2009] point out, military service negatively affects the returns to human capital. The reason is that skills previously acquired before military service and which are not used in the military may depreciate while on active duty. Skills learned in the armed forces are also not necessarily transferable to the civilian labor market. Moreover, the time spent on duty means that conscripts graduate from a higher educational facility at a later age than non-draftees, which implies that the conscripts have less time to spend in the civilian labor market. On the demand side, companies that realize that an employee or an applicant can still be drafted may choose not to invest in training. This anticipatory effect depresses the lifetime earnings profile of an individual [Albrecht et al. 1999]. The decrease in the returns to human capital and the increase in the opportunity costs of training at later stages in the life cycle translate to a decline in the quantity demanded of education.

For these reasons, one could expect that the number of university graduates is less for countries that still rely on compulsory military service (CMS) when compared to a country with an all-volunteer force, while adjusting for other factors that could plausibly influence the decision to graduate from university. However, for some countries such as the United States [Card and Lemieux 2001] and France [Maurin and Xenogiani 2007], there is a possible countervailing behavior because university education is one way to avoid being called into service.

This paper examines the issue within the context of Germany, where national service is still compulsory for men either in the form of military service (*Grundwehrdienst*) or civilian service (*Zivildienst*) for conscientious objectors.[1] Our objective is to estimate the causal impact of CMS on the probability of finishing a university degree. The identification strategy rests on the regression-discontinuity (RD) design of the military draft in Germany during the 1950s. When Germany was allowed to rearm itself after becoming a member of NATO in 1955, men born on or after July 1, 1937 had to undergo mental and physical examinations upon reaching the age of majority to determine whether they were fit to serve in the German armed forces (*Bundeswehr*). Those born earlier were exempted from CMS and are called the "White Cohort" (*weißer Jahrgang*). We use the latter as a control group to which we can compare the educational outcomes of those who faced a positive probability of being drafted. Assuming men born on either side of the threshold date are different only in that the White Cohort did not serve in the armed forces, the difference in the educational outcomes of the White Cohort and the non-White Cohort can be construed as the causal effect of conscription.

2 Related literature

This study locates itself at the intersection of two established areas of economic literature. The first examines the effects of military service on soldiers; the second, the effects of career interruptions on subsequent labor-market ourcomes. With regard to the former, Angrist [1990] finds that white Vietnam War veterans had lower annual wages than non-veterans. However, updated estimates by Angrist and Chen [2008] using the same data show that the wage gap vanishes in the long run. In Angrist and Krueger [1994], the authors demonstrate that the higher wages of "G.I.'s" (World War II veterans) compared to non-veterans are merely the result of how soldiers were selected into the armed forces (i.e., simple cross-sectional comparisons are biased and serving in the war did not have a positive causal impact on wages). While these studies use the date of birth as an instrument for veteran status, Imbens and van der Klaauw [1995] specifically look at the effect of CMS (as opposed to being a veteran of any war) in the Netherlands. Using variations in the probability to be drafted across birth cohorts as an instrument for being conscripted, they show that draftees earn about 5 percent less than those

[1]Conscription is enshrined in Art. 12a of Germany's constitution (*Grundgesetz für die Bundesrepublik Deutschland*). The rules and regulations are contained in the *Wehrpflichtgesetz*. Civilian service is governed by the *Zivildienstgesetz*. In the time period that we examine in this paper, the number of conscientious objectors is negligible. [Haberhauer and Maneval 2000]

who did not serve.

Other authors examine explicitly the effect of military service on educational outcomes. Using the trend in the college enrollment of women for comparison, Card and Lemieux [2001] estimate that "draft avoidance raised college attendance rates by 4–6 percentage points . . . and raised the fraction of men born in the mid-1940's with a college degree by up to 2 percentage points." A similar study concerning the effect of the abolition of conscription in France was conducted by Maurin and Xenogiani [2007]. In their paper, draft-avoidance behavior was also thought to motivate young men to stay within the formal educational system. Similar to the results obtained from US data, France saw a significant decrease in the time spent in school by and in the share of degree-holders among men as a result of the abolition. Cipollone and Rosolia [2007] exploit a natural experiment in southern Italy caused by an earthquake in 1980. This natural disaster prompted politicians to exempt certain birth cohorts of men from military service. The authors find that the exemption raised boys' high school graduation rates by over 2 percentage points. Bound and Turner [2002] present results indicating that military service and state funding for college availed by G.I.'s through the Servicemen's Readjustment Act of 1944 (the so-called "G.I. Bill") increased the post-secondary educational attainment of former soldiers. Finally, Keller, Poutvaara and Wagener [2009] analyze the issue at the macroeconomic level by taking 22 OECD countries and looking at the impact of CMS on the acquisition of post-secondary education. They find that enforcement intensity—measured as the share of the labor force conscripted and the duration of service—have a significantly negative impact on university enrollment figures.

Economists have also looked at the impacts of career disruptions (e.g., unemployment) on future labor-market outcomes. The conventional wisdom is that career interruptions mean foregone experience in the labor market and skill atrophy (i.e., human-capital depreciation). These disruptions have a persistent effect [Kletzer and Fairlie 2003] and even their timing and type matter [Kunze 2002]. In this line of research, much has been said about interruptions experienced by women for various reasons, such as child-bearing and -rearing [Albrecht et al. 1999]. These breaks contribute to the gender wage gap observed globally because women are much more likely to experience career interruptions than men. For men, being drafted into military service represents one form of career disruption and it is special in the sense that the break occurs typically between secondary and tertiary education. An interruption at such an early point in one's prospective labor-market career can have far-reaching implications.[2]

Methodologically, this paper is closest to Buonanno [2006] and Bauer et al. [2009]. Both papers take advantage of the discontinuity in the probability of being drafted into military service across birth cohorts. In the United Kingdom, this was caused by the abolition of military conscription in 1960. Buonanno uses this to estimate the impact of conscription on earnings and on educational attainment. He finds that conscription penalizes men but the resulting earnings disadvantage is attributed to lost labor-market experience and not through the educational channel. In fact, he finds little evidence to suggest that the demand for higher education is negatively affected by conscription. Bauer et al. use the same White Cohort/non-White Cohort distinction described in this paper to obtain the causal impact of CMS on long-run labor-market outcomes in Germany. The authors conclude that the superior labor-market performance of those who served in the *Bundeswehr* is merely an artifact of selection bias introduced at the time of the draft, viz. healthier men, who are more likely to perform well in the labor market, are precisely the ones who were called to serve.

3 Data construction and description

We use administrative data provided by the Institute for Employment Research (IAB) which is supplemented with additional information from state pension authorities (IAB employment supplement sample, IAB-S).[3] Except for some special groups like temporary civil servants and the self-employed, the dataset contains a 1-percent random sample of the total German population that was gainfully employed for at least one day for the period 1975–1995. Observed characteristics of individuals include sex, date of birth, nationality, occupation, qualification, and gross wage rate. The date of birth is particularly relevant for our identification strategy because it allows us to distinguish men who belong to the White Cohort from those who do not.

[2]See, for example, the introduction of Arulampalam, Gregg and Gregory [2001] on the "scarring" effects of unemployment.

[3]We use the same data in Bauer et al. [2009]. We briefly describe it here and refer the reader further to Bauer et al. [2009] and Bender, Haas and Klose [2000]. A new version of the IAB-S will be available for researchers via the Research Data Center of the German Employment Agency in the Institute for Employment Research (RDC–IAB) in 2011. See `http://fdz.iab.de/en/FDZ_Projects/BASID.aspx/`.

With respect to sample exclusions, the following were removed from the dataset: females, East Germans, persions who lived outside West Germany at any point (including foreigners and ethnic German immigrants), persons born before January 1, 1934, and persons born after December 31, 1940. Professional soldiers and those who underwent CMS and then subsequently became professional soldiers were also deleted from the dataset. We focus the analysis on men who have either completed the *Abitur*[4] or an apprenticeship since, for these men, the decision to enter university could still plausibly be affected by the possibility of being drafted into service. They are considered to have completed secondary schooling. This leaves us with a symmetric distribution of 15,835 men born around the threshold date who, if they performed *Grundwehrdienst*, served for not more than 12 months. Notably, in these years, only a negligible fraction of men were engaged in *Zivildienst* or other non-military services (*Wehrersatzdiesnt*).

Table 1 displays means and standard deviations of our outcome variable of interest over particular subpopulations. Graduating with a university degree means the person earned a degree from a *Hochschule*, which can take a number of forms such as the more technical *Fachhochschule* or the traditional *Universität*. Men who were drafted into military service have a lower share of having a university degree. It would therefore seem from this table that men who performed *Grundwehrdienst* are less likely to obtain a degree from a tertiary educational institution. For a variety of reasons (e.g., selection bias), however, a simple comparison of means can at most give us only the extent to which draft status is correlated with the likelihood of graduating from university.

Figure 1 plots the share of men drafted into CMS by month of birth. The White Cohort was completely exempted from the *Grundwehrdienst* and therefore the region to the left of the threshold date show points that lie only at 0. To the right of the vertical line, we observe that the share of men called into service started at about 18 percent, which then continuously declined until about the middle of the 1938 birth cohort. After which, the probability of being drafted increased until the end of the sample period. This evolution of the draft probability can be attributed to initial frictions experienced in the first few years of the reconstituted *Bundeswehr*. First, special exemptions were granted to some men. Second, the Cold War was intensifying as these men were reaching the age of majority. Third, temporary deferments of national ser-

[4]Passing the *Abitur* is the most common way for students to enter the university system. The certificate one obtains after passing the *Abitur* is thus functionally equivalent to a school-leaving certificate which enables students to pursue further education in the form of university training.

vice were granted to men who would experience serious personal or economic hardship if drafted. Some of these temporary deferments became permanent as soon as men turned 26 because the maximum age at which men could be drafted in Germany—except under special circumstances—is 25.[5]

The "reduced-form" relationship between birth cohort and graduation from university is highlighted in Figure 2. In Figure 2(a), it is apparent that in a small neighborhood around the threshold date, the share of men with a university degree exhibits a discontinuity. The source of this break can be seen clearly from Figure 2(b), where we split the non-White Cohort observations into those who served and those who did not serve. Here, it is obvious that those who were drafted into the *Bundeswehr* have a lower share of university graduates both when compared to the White Cohort and to the non-White Cohort but did not perform military service. These discontinuities shown in Figure 2 and the jump in the probability to be drafted shown in Figure 1 are what we exploit to recover consistent estimates of the causal impact of the *Grundwehrdienst* on the demand for higher education.

4 Estimation strategy and results

4.1 Identification through the RD design

Our identification strategy is anchored on the RD design of the military draft in Germany.[6] The White Cohort—men born before July 1, 1937—was exempted from CMS. Let N_i be equal to 1 if individual i does not belong to the White Cohort and 0 if he does. For those who were born on or after the threshold date, upon reaching the age of majority, men are subjected to a comprehensive medical examination to determine whether they are healthy enough to serve. Those who fall short may defer national service and those who have severe health issues are immediately and permanently exempted. Although one may be declared fit for *Grundwehrdienst*, this does not necessarily imply that one is immediately or actually drafted into service. The treatment status may thus be represented by M_i, which is equal to 1 if individual i was called to serve in the military and 0 otherwise. Men could therefore be in one of three different

[5] Among others, exemptions are granted to volunteers to the police, the Federal Border Guard, and priests. The special exemptions applied to about 10 percent of the men born between 1937 and 1944. About 3.5 percent of men in a particular birth cohort were exempted because they crossed the age limit. [Wehrstruktur-Kommission 1971]

[6] For references on the RD design, see Hahn, Todd and van der Klaauw [2001], van der Klaauw [2002], and Lee and Lemieux [2009].

possible states: ($M_i = 0$ and $N_i = 0$), ($M_i = 0$ and $N_i = 1$), and ($M_i = 1$ and $N_i = 1$).

The RD design is characterized by a treatment-assignment rule based on a known cutoff point with respect to an observable and continuous variable, which is called, *inter alia*, the forcing or running variable. As seen in Figure 1, the conditional probability of receiving treatment (i.e., serving in the *Bundeswehr*) is known to be a discontinuous function of the date of birth, B_i. Let $\overline{B}$ represent the threshold value at which point the conditional probability jumps—that is, the date of birth that distinguishes members of the White Cohort from the rest. The White Cohort is exempted from CMS so that $\mathrm{E}\left[M_i|B_i < \overline{B}\right] = 0$. On the other hand, for those born on or after $\overline{B}$, the probability to be drafted is a function of a vector of individual characteristics $\mathbf{x}_i$, i.e., $\mathrm{E}\left[M_i|B_i \geq \overline{B}\right] = f(\mathbf{x}_i)$.

The situation represented by Figure 1 is called the "partially fuzzy" RD design, where the jump in the conditional probability is not from 0 to 1 but rather from 0 to some value less than 1. More specifically,

$$\lim_{B \uparrow \overline{B}} \Pr(M_i = 1|B_i = B) < \lim_{B \downarrow \overline{B}} \Pr(M_i = 1|B_i = B),$$

where $\lim_{B \uparrow \overline{B}} \Pr(M_i = 1|B_i = B) = 0$. The conditions for proper identification of the treatment effect in this case are similar to those required in the sharp RD design, which is when the jump in conditional probability is equal to 1. [Battistin and Rettore 2008]

To estimate the causal impact of CMS on the probability of having a univeristy degree, we implement a two-stage least-squares (2SLS) approach.[7] The sequential system of equations is

$$\widehat{M_i} = \mathrm{E}[M_i|B_i] = f(B_i) + \delta N_i$$
$$Y_i = \alpha + \tau \widehat{M_i} + g(B_i) + \nu_i,$$

where the endogenous variable M_i is replaced in the second-stage by its predicted value $\widehat{M_i}$ generated from the first-stage linear regression. The disturbance term is represented by ν_i. The terms $f(B_i)$ and $g(B_i)$ are some arbitrary continuous functions of B. We apply the restriction $f(B_i) = g(B_i)$ so that the system collapses to a canonical two-stage least-squares instrumental-variable estimator for the parameters in the model, where $f(B_i)$ and N_i serve as instruments

[7] For similar applications, see van der Klaauw [2002] and Angrist and Lavy [1999].

for M_i. Military service is therefore instrumented by one's date of birth, which is presumably independent of the decision to obtain a university degree. In our specification, $f(B_i)$ is modeled as a higher-order polynomial of the difference (measured in days) of a man's date of birth and the threshold date, i.e., $\left(B_i - \overline{B}\right)$. These are interacted with N_i to allow for different slope parameters on either side of the threshold.

The coefficient of interest is τ, which is interpreted as a local average treatment effect [Imbens and Angrist 1994] valid for a small neighborhood around the point of discontinuity in the conditional probability of receiving treatment [Lee and Lemieux 2009]. That is, the estimand $\widehat{\tau}$ is equal to $\mathrm{E}\left[Y_i(1) - Y_i(0) | \text{unit } i \text{ is a complier and } B_i = \overline{B}\right]$, where $Y_i(M_i)$ represents potential outcomes and "complier" is used in the same sense as in Imbens and Angrist [1994]. Valid identification is possible as long as the conditional mean of the potential outcome $Y_i(0)$ is continuous at $\overline{B}$. [Hahn, Todd and van der Klaauw 2001]

The obvious drawback is the forced linearization of the conditional expectation function in both stages, which in principle could lead to biased estimates. While this does not affect consistency if the second-stage outcome variable is continuous [Angrist and Krueger 1994], the fact is that Y_i is dichotomous in this case. Therefore, we compare the estimates obtained from the 2SLS approach with non-parametric methods described in Hahn, Todd and van der Klaauw [2001] to roughly verify their consistency. The standard errors are clustered at the day of birth to allow for an unrestricted correlation structure within each cohort [Lee and Card 2008].

4.2 Regression results

We first present in Table 2 ordinary least-squares and probit estimation results of the type $Y_i = \alpha + \tau M_i + \mathbf{x}_i'\boldsymbol{\beta} + \epsilon_i$ and $\Pr(Y_i = 1 | M_i, \mathbf{x}_i) = \Phi(\tau M_i + \mathbf{x}_i'\boldsymbol{\beta})$, respectively, where ϵ_i is some stochastic disturbance and $\Phi(\cdot)$ is the standard normal cumulative distribution function. The vector $\mathbf{x}_i$ contains quarter-of-birth indicator variables.

Across all specifications, we find a significant negative correlation between serving in the *Bundeswehr* and having a university degree. The estimates range from -0.0304 to -0.0473. That is, having performed compulsory military service is associated with a decreased probability of graduating with a university degree. However, the usual caveat when $\mathrm{E}\left[\epsilon_i | M_i, \mathbf{x}_i\right] \neq 0$

applies. Explicitly, because of biases introduced by omitted variables (such as health status at the time of selection), the parameter estimate $\widehat{\tau}$ cannot be given a causal interpretation.

Table 3 shows results using the 2SLS approach that exploits the RD design of the military draft. We operationalize the control function $f(B_i)$ by expressing it as

$$f(B_i) = \sum_{j=1}^{J} \left[\lambda_{1,j} \left(B_i - \overline{B}\right)^j + \lambda_{2,j} \left(B_i - \overline{B}\right)^j \times N_i \right],$$

where $\lambda_{k,j}$ is a parameter to be estimated. Following Angrist and Lavy [1999], the degree of the polynomial that we use in the regression decreases as the "discontinuity sample" becomes tighter around the threshold point with $J \in \{1, 2, 3, 4\}$. The estimated coefficients of military service are all negative and much larger than the OLS and probit point estimates in Table 2. However, none are significant at conventional levels.

For comparison, we present the estimated coefficients using non-parametric methods. Note that the treatment effect can be represented as the following ratio [Hahn, Todd and van der Klaauw 2001]:

$$\tau = \frac{\lim_{B \downarrow \overline{B}} \mathrm{E}[Y_i | B_i = B] - \lim_{B \uparrow \overline{B}} \mathrm{E}[Y_i | B_i = B]}{\lim_{B \downarrow \overline{B}} \mathrm{E}[M_i | B_i = B] - \lim_{B \uparrow \overline{B}} \mathrm{E}[M_i | B_i = B]}.$$

We estimate the limits using local linear regressions suggested by Fan [1992]. Note that this formulation is similar to the instrumental-variable formulation of Wald [1940], the so-called "grouping estimator". Let $\overline{Y}_1$ and $\overline{M}_1$ be the subsample averages of Y and M, respectively, when $N = 1$ and similarly, $\overline{Y}_0$ and $\overline{M}_0$ when $N = 0$. Then,

$$\widehat{\tau}_{\mathrm{IV}}^{\mathrm{Wald}} = \frac{\overline{Y}_1 - \overline{Y}_0}{\overline{M}_1 - \overline{M}_0}.$$

The difference is that under the RD design, only observations around the threshold point are used to compute the parameter of interest. In our case, $\lim_{B \uparrow \overline{B}} \mathrm{E}[M_i | B_i = B] = 0$ because of the exclusion of the White Cohort from serving in the *Bundeswehr*. Standard errors are bootstrapped using 500 replications. The estimated treatment effect [standard error] using the triangular kernel is -0.0381 [0.1974] while using the rectangular kernel produces -0.1519 [0.2619]. The optimal bandwidth for both estimates is selected using a "rule of thumb" described in StataCorp [2007].

4.3 Discussion

Thus far, we have shown that cross-sectional comparisons of men who served in the *Bundeswehr* to those who did not reveal that military service is associated with a lower probability of obtaining a university degree. However, this cannot be interpreted as a causal effect because of the endogeneity of the treatment variable. Accounting for the endogeneity by exploiting an RD design in the conscription of men into military service indicates instead that CMS had no effect on the aforementioned probability. This is consistent with the evidence uncovered by Buonanno [2006] for the UK. In his study, which incidentally also employs an RD approach, he found that "the abolition of CMS did not affect the individual demand for education."

There are several possible reasons why the expected negative impact of CMS on educational attainment does not manifest itself in our investigation. First, as is well-known in the literature on career interruptions, the duration of the said interruption has a significant impact on future outcomes. The fact that these men serve for only 12 months (some serve potentially even less) may not have such a dramatic impact on their decision to pursue higher education.

Second, an employer choosing between two men both with university degrees and similar in all other respects except that one did not serve in the *Bundeswehr* may decide to opt for the man who has done his military service. This preferential hiring may be due to the fact that employers—at least at that time when the whole world was in a tenuous situation under the penumbra of the Cold War—reward those who have performed their duty to their country. More likely, however, is that employers prefer an uninterrupted employment contract. In Germany, those who deferred military service by going to university may still be drafted after completing their education and have already started working. This potential for disruption could discourage hiring of non-draftees because firm-specific human capital investments undertaken both by the employee and the employer, after all, are likely to depreciate while the individual is performing his military service.

Third, evidence found by Card and Lemieux [2001] and Maurin and Xenogiani [2007] indicate that university education is an indication of draft-avoidance behavior. Assuming that men would prefer not to serve in the military, they may enter university and enjoy a temporary deferment afforded to those who are still in the formal educational system. This incentive runs counter to the effect of a decrease in the returns to human capital generated by CMS. For example, in Germany, men older than 25 are drafted only under special circumstances. Typically, the maximum age for serving in the military is 25. Men could therefore enter the university and prolong their studies until they have crossed this age threshold.

5 Conclusion

While many countries have already abolished conscription (with a few more on the road to abolition), Germany is not unique in maintaining compulsory military service. It counts itself among the vast majority of Africa, central and southeast Asia, and countries like Russia, China, and Brazil as nations that insist on conscription. The effects on the lives of young men of a policy relying on what is essentially involuntary labor is a subject of extreme economic and political—if not moral—importance. How much is the State commanding these men to unwillingly sacrifice in the name of national service? The literature on the subject indicates that, at best, CMS has no effect on future labor-market outcomes and educational attainment. This means of course that some evidence do indicate that there is a penalty both in terms of the returns to human capital and the amount of investments in human capital. In our study, we focus on the latter and find that conscription has no effect on the probability of having a university degree for German men.

To arrive at this conclusion, we use the regression-discontinuity design of the military draft in Germany in the 1950s using a sample of men born between 1934 and 1940. The law governing conscription allows us to distinguish two groups of men: those born before 1 July 1937, which are called the White Cohort, and those born afterwards. What is unique about the White Cohort is that its members were completely exempted from performing military service. The rest, on the other hand, faced a positive probability of being called into service. This discontinuity in the treatment assignment based on a man's date of birth is used to obtain consistent estimates of the effect of CMS on higher education.

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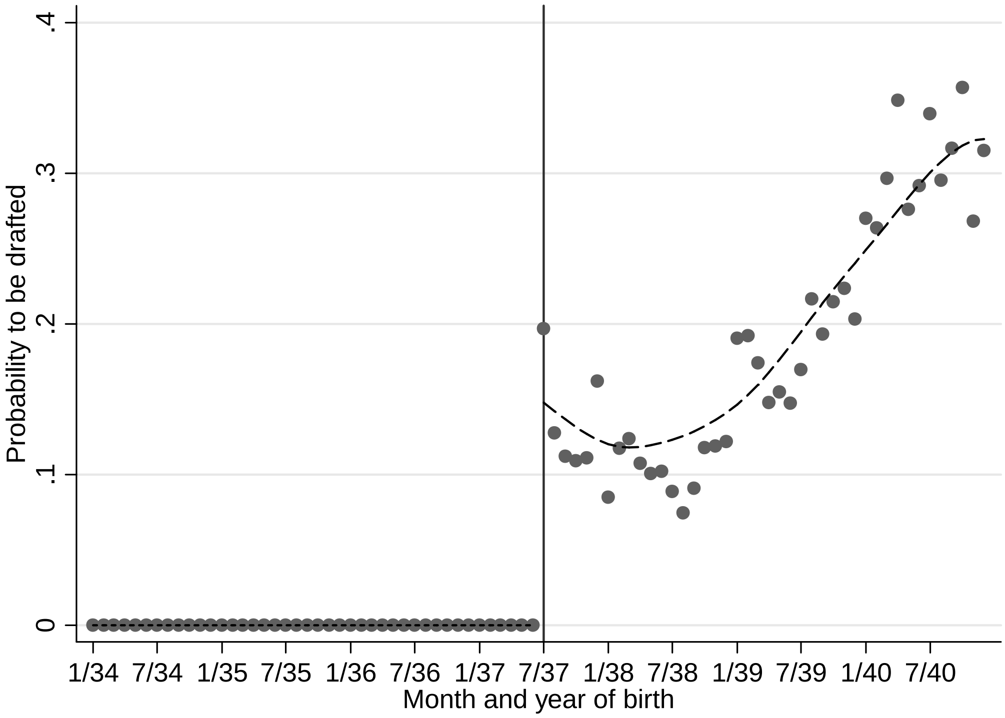
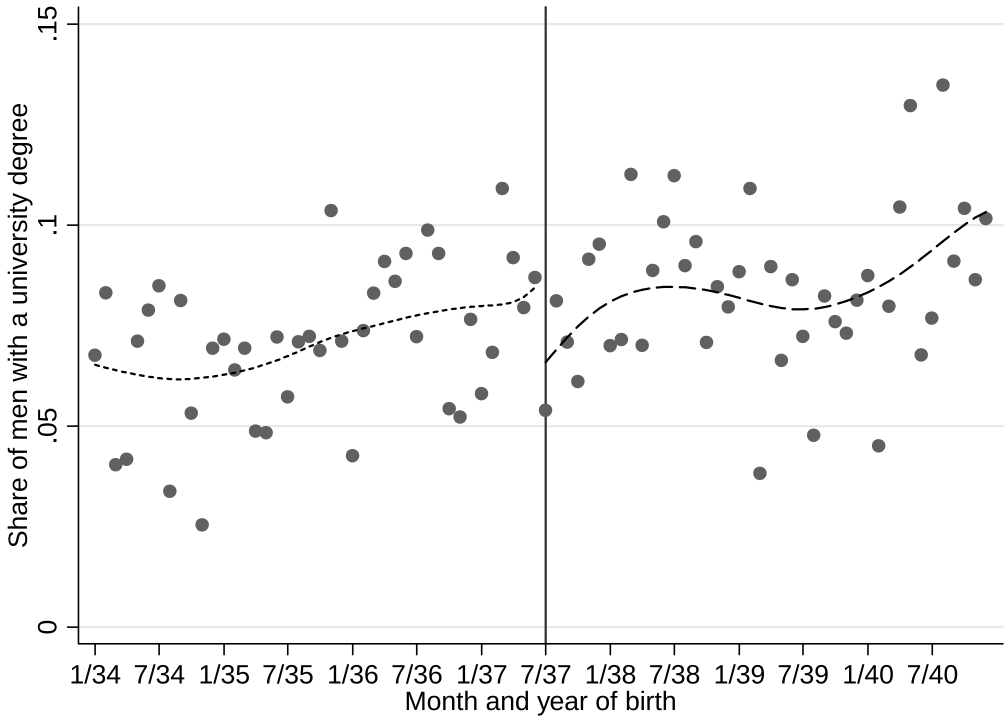
Figures

FIGURE 1 — PROBABILITY TO BE DRAFTED FOR MILITARY SERVICE BY MONTH OF BIRTH

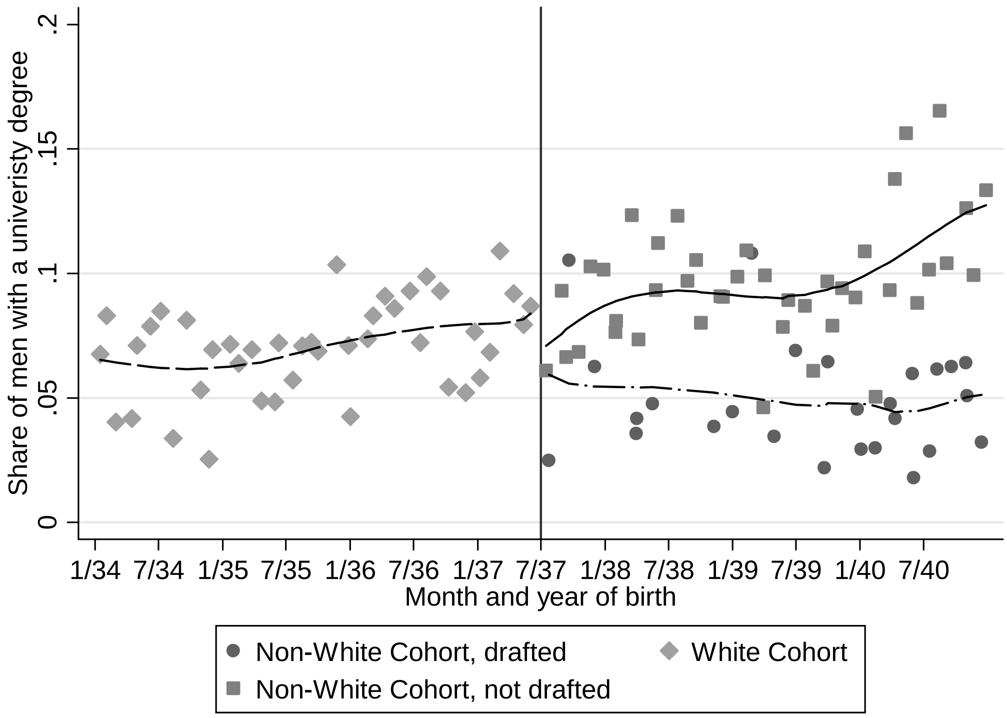


NOTE: Dashed lines are Lowess curves over White Cohort and non-White Cohort observations.
SOURCE: Author's own illustration.

FIGURE 2 — RELATIONSHIPS BETWEEN BIRTH COHORT AND UNIVERSITY GRADUATION RATE



(a) Share of men with a university degree by month of birth



(b) Share of men with a university degree by month of birth, disaggregated

NOTE: Dashed lines are Lowess curves over White Cohort and non-White Cohort observations.
SOURCE: Author's own illustration.

Tables

TABLE 1 — VARIABLE MEANS AND STANDARD DEVIATIONS

	White Cohort	Non-White Cohort		
		Total	Drafted	Not drafted
With university degree	0.0712	0.0885	0.0471	0.0959
	[0.2572]	[0.2840]	[0.2120]	[0.2945]
Observations	7,220	8,615	1,316	7,299

NOTES: Standard deviations are in brackets.
SOURCE: Authors' own calculation.

TABLE 2 — REGRESSION OF UNIVERSITY GRADUATION ON CMS

	Cohort		
	All	1935–1939	1936–1938
	Panel A: OLS		
Military service	−0.0365***	−0.0304***	−0.0388**
	[0.0062]	[0.0105]	[0.0155]
	Panel B: Probit		
Military service	−0.0436***	−0.0355**	−0.0473**
	[0.0090]	[0.0146]	[0.0240]
Quarter of birth included?	Yes	Yes	Yes
Observations	15,835	11,009	6,668

NOTES: For Panel A, bracketed numbers are robust standard errors clustered at the day of birth. For Panel B, marginal effects are reported with standard errors computed using the delta method. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
SOURCE: Authors' own calculation.

TABLE 3 — IMPACT OF CMS ON UNIVERSITY GRADUATION

	Cohort		
	All	1935–1939	1936–1938
Military service	−0.2003	−0.1536	−0.0930
	[0.1509]	[0.1370]	[0.1666]
Polynomial degree J	4	3	2
Quarter of birth included?	Yes	Yes	Yes
First-stage F-statistic	12.62	13.67	17.25
Partial R^2	0.0029	0.0086	0.0132
Observations	15,835	11,009	6,668

NOTES: Bracketed numbers are robust standard errors clustered at the day of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
SOURCE: Authors' own calculation.