

# Military Conscription and Higher Educational Attainment in Ukraine

Olena Berchuk<sup>a</sup>

<sup>a</sup>*Department of Economics, University of Delaware, Purnell  
Hall, Newark, 19716, DE, United States*

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## Abstract

Compulsory military service via draft is prevalent in several countries, with some leniency offered for university students. In 1989, a new Ukrainian conscription law delayed the draft for university students until after they graduate. This provided men in Ukraine with the opportunity to avoid the draft when the likelihood of combat was higher due to political instability. I apply a regression discontinuity to cohorts applying to university around two periods of instability in Ukraine (1990 and 2004). I find that the effect of deferral on higher educational attainment is large and connect these findings with the current situation in Ukraine.

*Keywords:* Labor Economics, Higher Education, Conscription, Public Policy, Human Capital, Labor Supply

*JEL Classifications:* J01, I23, J18, J24, J22

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## 1. Introduction

Countries have relied on mandatory military service to ensure a large enough military presence throughout history. Currently, 49 countries have compulsory military service laws in place, with conscription typically implemented via draft ([Bledsoe, 2023](#)). Several of these countries are reconsidering their existing conscription policies, while others are in the process of reinstating them. Given that many conscription policies are lenient for student pursuing a university-level education, either by allowing postponement of service or decreasing service length, it is important to understand how conscription policies and their changes impact educational attainment. The presence of conflict and increased risk of future conflict paired with military conscription policies raises questions of how such policies either incentivize or

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dis-incentivize educational attainment during unstable times. Understanding the channels through which these policies impact educational incentives, especially in times of war and political instability, is important. I use a regression discontinuity framework to look at the impacts a Ukrainian policy delaying conscription for university students has on educational attainment for men during times of political instability, both immediately after the policy change and when the policy had been in effect for over a decade.

In 1989, a conscription law change excluded university students from the draft until they graduated. This created an incentive for students to push the risk of being drafted to the future in return for current safety. For 1989 high school graduates, this policy change came too late to re-optimize their university decisions. Using a regression discontinuity design, I focus on 1990 high school graduates as the first cohort treated by the policy. I find that this policy change resulted in a discontinuous jump in the total years of education for the treated cohort. Men who graduated high school in 1990 were about 16 percentage points more likely to earn at least a bachelor's degree than those who graduated in 1989. Concurrent to this policy change Ukraine experienced political instability that increased the likelihood of seeing conflict while serving in the military. 1990 was an incredibly uncertain time of transition for the country and led to Ukraine's independence and the formal dissolution of the Soviet Union in 1991.

I look at a subsequent period of instability that allows me to separate the effects of the conscription policy change from a response to an increased likelihood of seeing conflict. The Ukrainian election of 2004, i.e., the Orange Revolution, was between a pro-Russian and pro-Western candidate. While the pro-Western candidate had popular support, the pro-Russian candidate was backed by Russia and the existing political system. The resultant tensions created uncertainty around Ukraine's future — there could be violent repressions by the pro-Russian incumbent party or a heightened likelihood of conflict with Russia if the pro-Western party won. For students making their decisions to attend university in 2004, either outcome came with an increased likelihood of military conflict. I check for a discontinuity in educational outcomes for this 2004 cohort and find that the 2004 high school graduates were about 17 percentage points more likely to earn at least a bachelor's degree. Together with the discontinuity in 1990, these findings suggest that university deferral from military service is most valuable when the likelihood of conflict is highest. I further show this by looking at the sudden increase in male university entrants after the start of the Russo-Ukrainian war in 2022.

In addition to clear policy relevance, my work contributes to the military conscription and education literature by looking into the role risk plays in human capital accumulation, which in turn influences the demand for higher education. In particular, I focus on how safety today (in the form of delayed conscription until after graduation) creates additional incentives to pursue tertiary education. This relates broadly to choice under uncertainty and can have potential policy implications regarding labor market reforms to anticipate an increased demand for education during heightened times of global uncertainty and increased risk of conflict. Importantly, my findings provide insight on why it is that the military conscription literature cannot reconcile whether conscription has a positive effect on education. Without the threat of actually seeing conflict, conscription may be seen as just an inconvenience that is not sufficient for men to change their education and labor market plans.

The impact of compulsory conscription on university enrollment and graduation rates has been studied in a variety of settings. However, a consensus on whether or not conscription affects education has not been reached. A few studies find a positive effect. In the United States during the Vietnam War, attending college allowed for deferments from the draft, resulting in higher college attendance rates for men in the 1960's ([Card and Lemieux, 2001](#)). Similarly, when Germany introduced conscription in 1955, the cohorts subject to conscription were much more likely to hold a university degree ([Bauer et al., 2014](#)). On the flip-side, the incentive to continue into higher education disappeared when France abolished compulsory conscription in 1997. French men would regularly use education as a means to avoid military service in the army; with this added benefit gone, educational achievement for men fell relative to women ([Maurin and Xenogiani, 2007](#)).

Other studies did not find much of an effect of conscription on education. [Buonanno et al. \(2006\)](#) look into the 1960 abolition of compulsory military service in the UK and find little difference in years of educational attainment between cohorts. A study on the abolition of compulsory military service in Italy likewise finds no statistically significant evidence that this change affected university enrollment decisions ([Di Pietro, 2013](#)). In a panel study of 22 OECD countries, [Keller et al. \(2010\)](#) find that the existence of military conscription has a negative effect on education, although the finding has low statistical significance. [Hubers and Webbink \(2015\)](#) find a similar result in the Netherlands. Exploiting the variation from a policy change that exempted an entire birth cohort from military service, they find that com-

pulsory military service decreases the probability of a student obtaining a university degree.

My findings suggest that the disagreement in the conscription and education literature discussed above may be explained by the timing of the conscription policy change. The studies with positive effects of conscription on education take place during the Vietnam War or in 1950's West Germany while tensions with Soviet controlled East Germany were at an all-time high as opposed to relatively peaceful times within the UK and Italy when conscription was abolished. For men undergoing conscription during a peaceful time, the labor market interruption may be seen as more of an inconvenience as opposed to the potentially life-threatening situation conscription becomes if drafted during a potential war. This difference in the perceived likelihood of having to serve in combat upon being drafted greatly influences how willing men would be to try to get a draft deferment (which takes effort, time, and foregone resources) vs. just go along with conscription. As my findings show, university enrollment and graduation in Ukraine sharply increased during times when men expected they would actually see conflict even after the conscription policy change had been in place for over a decade. And the reason for this sudden increase cannot solely be attributed to the new conscription policy introduced just before 1990. The effect of just the 2004 instability (without the conscription policy change) had just a large if not a slightly larger impact on educational attainment than the conscription policy change itself when it was first introduced.

I also show that the political instability can be temporary and still have long-run consequences. The two periods of instability I study have an increased risk of potential conflict persisting for a few years at most, but the resultant increase in educational attainment continues beyond the initial increase. Just a few cohorts suddenly gaining more education already changes the future labor market supply and the skill-set of the available workforce, and can influence later cohorts even if they are not directly responding to the instability. For the past two decades, Ukraine has been suffering from a persistent education-job mismatch [Kupets \(2016\)](#). My findings suggest that this may be a direct result of the sudden increases in demand for educational attainment. The discussion section further explains the long-run labor market consequences of large masses of individuals selecting to attain less applicable degrees when they focus on evading the draft rather than on future earnings.

Additionally, I contribute to the literature on allocation and sorting into higher education. With the additional incentives that a university deferment

from conscription provides, individuals do not just choose to attend university based on academic ability, but on aversion to fighting. This brings into question the effectiveness of conscription-based policies. The literature was initially convinced that an all-volunteer army is cheaper and more socially efficient than a draft because it avoids the manpower mis-allocation costs of conscription. However, with the introduction of costly deferments (in the form of individuals using resources to avoid service that they would otherwise not use, such as paying to attend university), the usual mis-allocation of resources with conscription can be avoided. The “wrong” individuals who have a higher return in the civilian labor market will be more willing to pay for deferments and thus will not be drafted (Berck and Lipow, 2011; Perri, 2010; Warner and Asch, 1996; Lee and McKenzie, 1992). The risk of actual conflict distorts this sorting behavior. In the conceptual framework, I show how individuals will be more willing to take on costly deferments (i.e. go into higher education) if they have an aversion to fighting, resulting in a conscription policy that lacks manpower.

The rest of the paper is organized as follows. Section 2 provides the historical and contextual background for Ukraine and the political climate that led to the two periods of instability that I study. Section 3 shows a conceptual framework for the choice to invest in human capital and how it interacts with conscription and safety. Section 4 sets up the regression discontinuity strategy I use. Section 5 describes the data, Section 6 presents the results, and Section 7 provides a series of robustness checks. Section 8 provides an insight into the driving force from the labor market supply side that likely caused the high and persistent education-job mismatch in Ukraine today. It also shows additional evidence using Ukraine’s recent conflict with Russia and considers the potential future long-run impacts on the labor market in Ukraine following the start of the war. Section 9 concludes.

## 2. Background

### *Conscription and Instability*

#### *1990, Educational Deferment, and the End of the Soviet Union*

From 1922 to 1991, Ukraine was a part of the USSR. Prior to 1989, any men between the ages of 18 and 27 could be drafted on a semi-annual basis, either in late spring or late fall. Male university students were eligible for this draft like any other similarly aged person. If they were drafted, they served their two years immediately, interrupting their university studies for

that period. As part of the *Perestroika*, Gorbachev passed a USSR-wide law on July 11th, 1989, that delayed the draft for all full-time university students until after they graduated. Starting in the fall of 1989, if a man was a university student or was going to attend university immediately after graduating high school, he could not be drafted until he graduated. The timing of the 1989 law partially caught the cohorts who were applying to universities in 1989, but its impact primarily influenced labor market decision making for the cohorts applying to college in 1990 and later.

This new conscription law was passed shortly before a highly unstable time for Ukraine that resulted in Ukraine's independence from the USSR in August, 1991. Starting in 1990, there was uncertainty in the country about retaliation from the USSR for attempting to gain independence. There was also the potential for a civil war to break out between Eastern and Western Ukraine due to the religious and political differences between the two regions. Many people feared that the political developments towards independence would lead to an explosion of violence, and for men of conscription age, this was a particularly real threat. Fortunately, Ukraine did not spiral into an outbreak of violence and continued on to take the first steps towards a more democratic governing system. Those graduating high school in 1990 had no way of knowing this. For additional details on the political landscape of the time and more background as to why tensions developed, see [Appendix A](#).

After gaining independence, Ukraine retained the Soviet Union's conscription policy, switching to call-ups only once a year. Men who turned 17 at the time of registration (from January to March each year) were required to register with enlistment offices. Almost all 18-year-olds were conscripted, along with men up to the age of 27 who previously had deferments (due to attending university or family/health reasons). While the university deferment only granted amenity until one graduated, the additional time provided men a chance to secure a familial circumstance, such as having a child under the age of 3, that would grant them a new deferment (thus delaying conscription indefinitely until they aged out of the conscript pool) [Verkhovna Rada of Ukraine \(1992\)](#). The initial law from 1989 that deferred the draft for university students remained in place until May 18, 2024.

#### *2004, Tensions with Russia, and the Orange Revolution*

The election of 2004, also known as the Orange Revolution, was another time of instability, again due to the potential change to the nature of Ukraine's relationship with Russia. This election pitched a pro-Russian,

status-quo candidate, Viktor Yanukovich, against Viktor Yushchenko, who had pro-Western views and wanted to move Ukraine closer to the EU with the goal of joining NATO. During the campaign leading up to the election in October 2004, tensions in Ukraine were extremely high, with assassination attempts on the pro-Western candidate, state repression of crowd protests, and threat of conflict between Western and Eastern Ukraine. The country came close to violence on a number of occasions during the election campaign and there was also uncertainty around Ukraine's stability regardless of which candidate won. If the pro-Russian candidate won, there would likely have been a civil war, or at the very least, a violent reaction to maintaining such close ties with Russia. There was also the chance that if the pro-NATO candidate won, Russia would retaliate directly. Once again, for men of conscription age, the threat of conflict both internally and with their Russian neighbor was very real. For additional details on the political landscape of the 2004 election and more background as to why tensions developed, see [Appendix A](#).

### *Education in Ukraine*

In the USSR (and Ukraine by extension), students started school at age 6, went through 11 years of grade school, and graduated from high school at the age of 17. The decision to continue to higher education was complicated and time intensive: universities required students to take university-specific entrance exams, typically held over the same several days in August on-site at universities across the country. A prospective student would have to commit not only to a university of choice, but also to a specific major/track, which influenced the subjects the student took exams for at that university. Most students sat exams only for their one, chosen university. Results were released within two to or three weeks, before classes began in the fall. If a student failed to make a sufficiently high enough grade on the entrance exam, he could not fall back on an application to a less prestigious university, so students had to carefully weigh their chances of success at getting into the university/track they selected. While education was free for all Soviet citizens and students were even given a small stipend, there were limited seats at each university/track every year. At some of the top universities, there would be as many as 10 to 15 students competing per seat ([Jacoby, 1971](#)).

The educational landscape in Ukraine was largely similar. Ukraine continued to support public education and provide stipends for students after gaining independence. Due to limited seats, many private universities opened

([Bunina, 2013](#)). Students making the decision to apply to university around 1990 and around 2004 would have felt uneasy about the future due to the circumstances described earlier. Having the opportunity to delay the draft provided a valuable chance to wait and see what the next few years would bring without the risk of being on the front lines. Inadvertently, this increased the educational attainment for the populace as a whole, even if the driving motivation had little to do with gaining more human capital.

With the fall of the Soviet Union, the higher education system in Ukraine expanded and several private universities began to open between 1992 and 2000. This rise in quantity did not necessarily translate to quality ([Shandruk and Shatrova, 2015](#)). While private universities were becoming more available, they were viewed as less prestigious and respected than the public ones (not to mention, they did not offer any stipends like public universities did). These universities generally provided lower quality education and their graduates had lower chances of a successful career after graduation and were not particularly sought after. In 2013, for example, despite making up 29.5% of all universities in Ukraine, they only accounted for 11.7% of all university graduates ([Kupets, 2016](#)). These private universities were possibly the only chance for desperate students who hoped to get a draft deferment but did not think they would do well enough on entrance exams for a public university. The added cost of tuition fees however, means that most students would strive for a public university, which is free and provides a stipend.

While the increase in private universities allowed for more opportunities to gain education, the reason so many opened is likely due to the higher demand, driven by men hoping to avoid the draft (not due to more men seeking a higher education simply because more universities were available). After all, with the prestige continued to be offered by free, public universities, there would be no reason for so many private universities to open if there would be no one to attend them. I discuss this reasoning more in the robustness check section when I look at the outcomes for women, who were not impacted by conscription policy changes, but should show a response to any changes in educational opportunities.

### **3. Conceptual Framework**

Upon high school graduation, each adolescent faces a decision: gain more schooling, or enter the job market, with the goal of maximizing the net present value of life time utility. The conscription policy I look at changes



the usual risks associated with this decision (uncertainty around future wages for college major, uncertainty about the job market in the future, etc.) by also allowing individuals to account for their present safety. Men facing conscription now had the opportunity to delay the risk of seeing combat by pursuing more schooling. As this change is only for men, returns to education, the availability of education, and other factors are expected to remain mostly unchanged for women, within the confines of dynamic effects in human capital for men.

When the goal is to avoid the draft and thus maximize utility through maximizing one's safety, the quality of university and the major choice is not as important. A student pursuing higher education as a means of draft postponement has to consider the costs and risks of applying to different universities and majors and weigh them against the delay of being drafted for military service. There would be little point in delaying applying to a university by a year if a student did not think he would get into his top choice. Any individual not enrolled in university who turned 18 by the call-up date would be drafted for service immediately, unless he had a deferment due to family or health problems. In order to get a student deferment and delay the draft, a student may find it more worthwhile to apply to a much less prestigious university and not a major/track that is particularly interesting or has a chance of higher earnings in the future. This decision centers around a trade-off between today's safety and potential earnings in the future from attending a better university / studying a more in-demand major. How much each individual ends up valuing his future payoffs versus current safety depends on how much he discounts the future and his own personal level of risk-taking.

It is also worth mentioning that the types of students who were influenced to go to university in order to evade the draft were on the fence for whether or not they wanted to pursue higher education. Individuals who had already planned to continue their education would have gone to university regardless of whether or not student deferments were available. Similarly, individuals who expected they had virtually no chance on entrance exams and/or were already on a vocational track were unlikely to suddenly change course. The estimates from changes in educational attainment around the years I focus on come from the individuals who were marginal in choosing between continuing on to college and going straight into the labor force.

This self-selection into higher education due to a desire for safety and aversion to fighting impacts government-level decision making as well. Un-

der peaceful circumstances, conscription with costly deferments allows for an efficient allocation of conscripts. Only individuals who have high returns in the civilian labor market take on the costs of deferment (such as going into higher education) and thus the “wrong” individuals are not conscripted. During less peaceful or politically unstable times, risk (fighting) averse individuals are much more willing to take on the costly deferments, even if their returns to the civilian labor market are much lower than the typically “wrong” individuals. As a result, much less of the population is able to be drafted and the costly deferments are no longer successfully sorting the two groups based on civilian productivity and ability. This results in a quantity vs. quality trade-off for the military, where on one hand, fighting averse individuals sort themselves out, but on the other, these same individuals could still have been useful as sheer numbers for menial work. When larger numbers are needed, educational deferments are no longer as powerful of a tool to sort out the individuals who have high labor productivity. To further sort individuals, governments would need to spend additional costly resources, while removing educational deferments entirely risks potentially losing individuals with very high civilian labor market productivity. During a war, numbers can make a difference between potentially winning or losing. Governments and policy makers need to carefully consider the incentives university deferrals create for individual decision-makers during times of conflict and the mis-allocations in the military force they create. In a time of national vulnerability, such as Ukraine’s current war with Russia, it may even be in a country’s best interests to roll university deferrals back.

#### 4. Empirical Strategy

I estimate two separate local linear regressions for individuals within cohorts that made the decision to attend university around the two politically unstable time periods in Ukraine: 1990 and 2004. Under the Soviet Union and in Ukraine, a student had to be 6 years old by September 1st to start school. I define each cohort as individuals born September through August of the following year and assign each cohort their respective high school graduation year (cross-referenced with the high school graduation year listed for each respondent in the ULMS for accuracy). For example, the cohort that made their decision to attend university in 1990 will have students born in September 1972 through August 1973. The educational outcomes for this cohort will be represented by “1990” in all graphs. Similarly, the cohort

that made their decision to attend university in 2002 will have students born in September 1984 through August 1985 and all educational outcomes for this cohort will be represented as "2002" in all graphs. Therefore, I run the following specification for individual  $i$  in cohort  $c$ :

$$Y_{ic} = \alpha + \tau D + \beta_1 r_{ic} + \beta_2 D r_{ic} + \Theta T + \Gamma X_{ic} + \epsilon_{ic} \quad (1)$$

Here,  $Y_{ic}$  represents educational attainment. I define treatment as graduating high school during a politically unstable time, represented by the binary treatment indicator  $D$ , which takes on a value of 1 when a cohort applied to college following 1990 and 2004, respectively. The running variable  $r_{ic}$  is the cohort, or the year an individual graduated high school. I include an interaction between  $r_{ic}$  and the treatment indicator to allow the slope to vary on either side of the discontinuity.  $T$  is a birth-month-year time trend, and  $\Gamma X_{ic}$  is a set of individual-level covariates. This set of covariates includes the level of parental involvement in an individual's education, whether or not the individual was born in a more rural or urban area, the level of risk taking in a lottery game set-up, whether or not the individual worked while still in high school, whether they believed themselves to be a good student relative to the rest of the class, and parental education.

In following standard regression discontinuity design (albeit with the caveat of using a discreet running variable), I assume that cohorts on both sides of each cutoff (1990 and 2004) are extremely similar to each other, so treatment (exposure to a politically unstable time) is as good as random. I compare the similarities of the cohorts graduating before and after each political instability to make sure there is no other factor driving the jump in instability. Summary statistics of observable covariates for treated and control cohorts can be found in Tables B.1 and B.2 of the appendix. I also assume that cohorts had no way of anticipating or acting on the upcoming instability, given that it would be incredibly difficult for most students to graduate earlier or to get themselves back by a year or more in grade school. It was rare for students to be held back a year, with the rigid Soviet system instead opting to either push students through to graduation anyway or to fail them out. Density graphs for cohorts around 1990 and 2004 are provided in [Appendix C.1](#). One of the drawbacks of using a regression discontinuity is that my estimates will be relevant for the cohorts closest to 1990 and 2004. These findings may not be generalizable for earlier or later cohorts which may somehow be significantly different from the cohorts in my study.

For my main estimates, I work with robust standard errors, clustered at the birth year and month, as is standard practice when using a discrete running variable. However, [Kolesár and Rothe \(2018\)](#) suggest that due to the limited number of values close to the cutoff threshold in cases such as this, clustering by the running variable understates the statistical uncertainty associated with the estimates. This can lead to incorrect claims of the statistical significance of estimates and results that are not robust in cases of model misspecification. Instead of the conventional Eicker-White (EHW) heteroskedasticity-robust standard errors, the authors recommend using a nearest neighbor standard error set up with a bound on the second derivative of the conditional expectation function. In the robustness section, I provide my main estimates using the alternative confidence intervals [Kolesár and Rothe \(2018\)](#) recommend, using their STATA package `rdhonest`.

## 5. Data

I use the Ukrainian Longitudinal Monitoring Survey (ULMS), collected in a joint effort by the Institute of Labor Economics (IZA) and the World Bank ([Institute of Labor Economics \(IZA\), 2014](#)). A statistically representative sample of the Ukrainian population at the national level, the ULMS is a panel data set comprised of about 8,500 individuals between the ages of 15 and 72. Responses were collected across four waves from 2003-2012 at the household and individual level and include information on employment, unemployment and job search, education, and health. Sampling weights are provided for each of the four waves to ensure that any estimates are nationally representative. Since I use a regression discontinuity design, I focus on just the 2012 questionnaire to maximize the number of individuals who had made the decision to go to college by then. The last cohort to make their decision to pursue higher education that I use was born in late 1991 and 1992. Any individuals born after this would not have had the chance to graduate high school in time to make this decision and/or answer the survey questions on higher education. Since I am able to observe birth year and month, I group cohorts by academic year rather than simply birth year. If a student was 6 years old prior to September 1st, they would have started school that year. Meanwhile, any students born the same year, but who turn 6 years old after September 1st, would have to wait until the following year before starting school. For example, an individual born any day of the month prior to September 1st, 1976, would apply to university in the summer of 1993,

while an individual born after September 1st in that same year would have to wait one year before going to school and would be in a later cohort, applying to university in the summer of 1994.

The data set I use provides me with a categorical variable for the highest education an individual has completed, which I convert to years of education (i.e., a high school diploma is completed in 11 years, a bachelor's degree is equivalent to 15 total years of education). It is worth mentioning that under the Soviet Union, the first higher-education diploma was a specialist degree, typically completed in five years. This falls somewhere between a bachelor's and a master's degree and is usually equivalent to a master's degree in the US. Even as Ukraine adopted the use of bachelor's and master's degrees, the specialist degree continued to be offered in most Ukrainian universities until 2016. I convert specialist degrees to 16 years of total education and define individuals with specialist degrees as having at least a bachelor's degree.

Tables 1 and 2 provide summary statistics for the covariates I use for men who graduated high school around 1990 and 2004, respectively. To accurately reflect the bandwidth of  $\pm 6$  years that I use throughout this paper, Table 1 only includes individuals who graduated high school between 1985 and 1995, while Table 2 is restricted to individuals who graduated high school between 1999 and 2009. Besides birth year and parental education, which are represented in years, all the other covariates listed are presented as a percentage. For example, a value of 0.53 for "Born in Village" for the pre-1990 cohorts means that on average, 53% of the individuals who graduated high school before 1990 were born in a village. For more discussion on the components of each of the covariates I include, see the appendix [Section B](#).

In general, the groups of cohorts are fairly similar to each other, with the only statistically significant difference (besides birth year) being in parental education. The parents of treated cohorts (graduating post-1990 or post-2004) are more highly educated on average. This can be explained by the overall upwards trend in educational attainment, which I control for in my estimates. I include a check for the smoothness of parental education across the cutoff in Appendix [Section C.2](#).

## 6. Results

I first run a preliminary check to see if there is a significant difference in education outcomes between both groups of cohorts around 1990. I use an indicator for whether or not an individual received at least a high school

Table 1: Summary Statistics of Covariates Around 1990

	Pre - 1990			Post - 1990			Diff
	N	Mean	SD	N	Mean	SD	
Birth Year	167	1969.56	1.44	208	1975.04	1.78	5.480***
Parents Involved	167	0.59	0.49	208	0.54	0.50	-0.048
Born in Village	167	0.53	0.50	208	0.46	0.50	-0.065
Born in City	167	0.38	0.49	208	0.44	0.50	0.065
Risk	167	0.18	0.39	208	0.14	0.35	-0.035
Patient	167	0.20	0.40	208	0.16	0.37	-0.039
Work Before Age 15	167	0.08	0.27	208	0.12	0.32	0.038
Good Student	167	0.29	0.46	208	0.34	0.47	0.043
Father's Education	166	10.50	2.36	207	11.29	2.02	0.785***
Mother's Education	167	10.41	2.72	207	11.17	2.01	0.756***

*Note:* Besides birth year and parental education, which are represented in years, all other covariates in the summary statistics table are presented as a percentage.

Table 2: Summary Statistics of Covariates Around 2004

	Pre - 2004			Post - 2004			Diff
	n	mean	sd	n	mean	sd	
Birth Year	230	1983.70	1.45	276	1989.03	1.75	5.333***
Parents Involved	230	0.63	0.48	276	0.67	0.47	0.044
Born in Village	230	0.39	0.49	276	0.39	0.49	0.004
Born in City	230	0.47	0.50	276	0.53	0.50	0.056
Risk	230	0.14	0.35	276	0.18	0.39	0.038
Patient	230	0.17	0.37	276	0.22	0.41	0.052
Work Before Age 15	230	0.07	0.25	276	0.08	0.27	0.010
Good Student	230	0.41	0.49	276	0.47	0.50	0.054
Father's Education	228	11.40	1.70	267	11.57	1.80	0.166
Mother's Education	230	11.62	1.86	275	12.07	2.12	0.444**

*Note:* Besides birth year and parental education, which are represented in years, all other covariates in the summary statistics table are presented as a percentage.

diploma as well as whether or not the individual received at least a bachelor's degree. As expected, Table 3 shows that on average, cohorts who graduated high school after 1990 are more educated. This difference does not stem from a change in the percentage of men finishing their high school degree, however. Instead, it is driven by the post-1990 cohort having a larger percentage of individuals with at least a bachelor's degree.

Table 3: Preliminary Comparison of Average Educational Attainment Around 1990

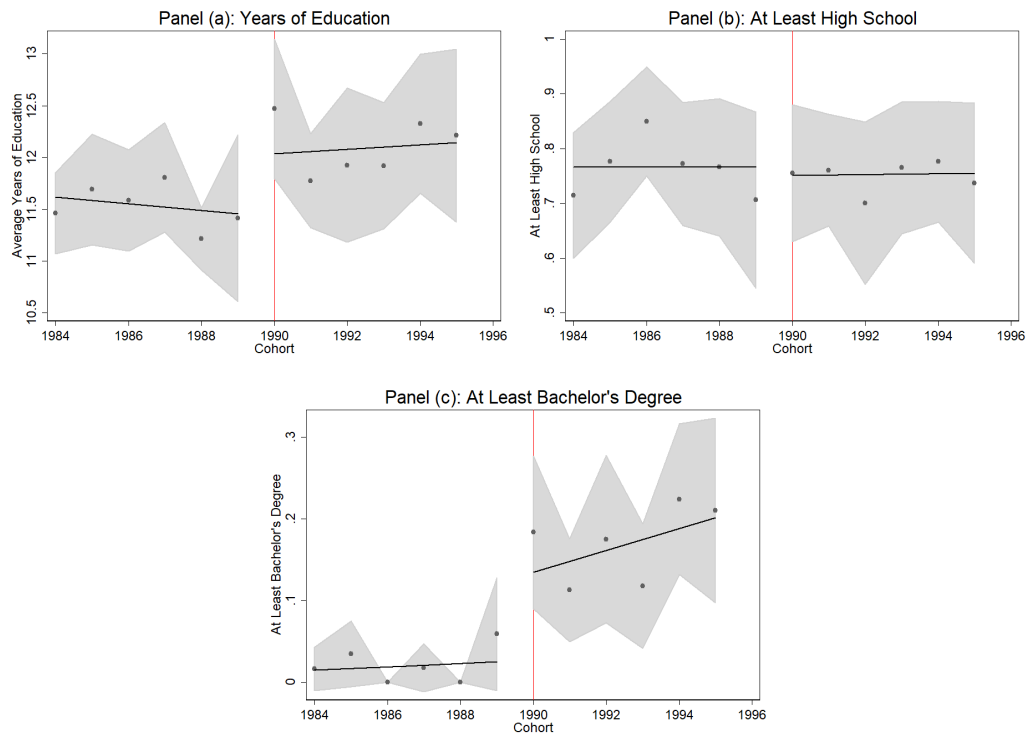
	Pre - 1990			Post - 1990			Diff
	N	Mean	SD	N	Mean	SD	
Years of Education	167	11.54	1.91	208	12.24	2.35	0.697***
At Least Highschool	167	0.77	0.42	208	0.75	0.43	-0.012
At Least Bachelor's	167	0.02	0.13	208	0.18	0.38	0.160***

*Note:* This table estimates the mean and standard deviation for each educational outcome for men in the control cohorts (graduating before 1990) and the treated cohorts (graduating after 1990), as well as the difference between the two groups. To match the bandwidth of  $\pm 6$  years that I use for my estimates, this sample is restricted to men who graduated high school between 1985 and 1995.

Graphically, I present the discontinuities in educational attainment for men around 1990 in Figure 1. Each point represents the average educational attainment for each cohort, which is the running variable along the horizontal axis. For example, the cohort that applied to university in 1994 had about 12.4 years of education on average. For that same cohort, a little over 20% of the men received at least a bachelor's degree and about 78% of them received a high school diploma. The shaded area represents the 95% confidence interval around each regression.

Starting from panel (a), there is a jump up in average years of education around 1990, by what looks to be a little under a year. There is no such discontinuity when looking at the percentage of men with at least a high school diploma (panel (b)). This is to be expected, given that the benefits of delaying military service only applied to university students. If a student was on the margin of graduating high school, the delay in the draft would not influence his decision. Finally, panel (c) shows that there is a discontinuity in the percentage of men who have at least a bachelor's degree around 1990, matching the jump in average years of education.

Figure 1: Differences in Education Outcomes Around 1990





For cohorts who choose to attend university around 2004, I repeat the process and show the preliminary check in Table 4. On average, cohorts that graduated high school after 2004 were more likely to get at least a bachelor's degree. This is not reflected in the years of education, but it is important to keep in mind that the younger cohorts have not had the opportunity to obtain as many years of higher education as the older cohorts. For the cohorts who made their decision to attend university after 2007, by the 2012 survey year, they likely have not completed their diploma yet and have not had the chance to pursue an even higher degree at that. While I cannot extrapolate how many years it would take these individuals to finish their bachelor's degree, I count those currently enrolled in a bachelor's program as "holding" at least a bachelor's degree for my estimates around 2004. By the time I see these individuals in 2012, they are already halfway through their studies and would most likely graduate, given that the dropout rate is highest for first-year university students. With time and a more recent data set, the difference in the average years of education between the two groups would be statistically significant.

Table 4: Preliminary Comparison of Average Educational Attainment Around 2004

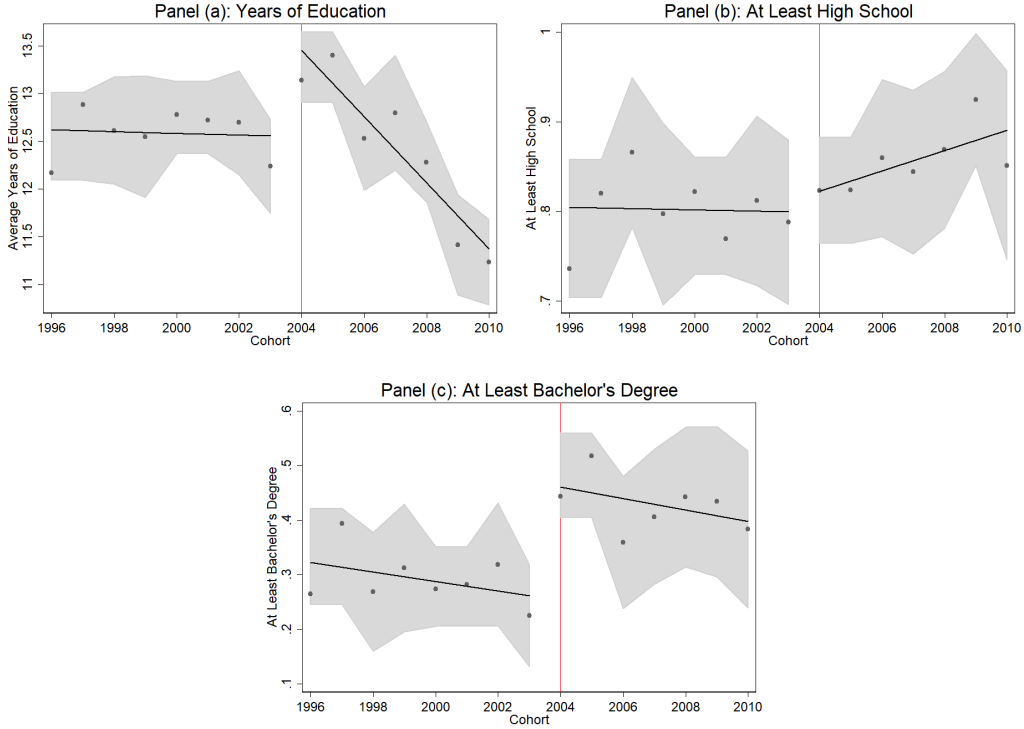
	Pre - 1990			Post - 1990			Diff
	N	Mean	SD	N	Mean	SD	
Years of Education	230	12.71	2.34	276	12.76	2.35	0.049
At Least Highschool	230	0.83	0.38	276	0.86	0.35	0.036
At Least Bachelor's	230	0.30	0.46	276	0.49	0.50	0.188***

*Note:* This table estimates the mean and standard deviation for each educational outcome for men in the control cohorts (graduating before 2004) and the treated cohorts (graduating after 2004), as well as the difference between the two groups. To match the bandwidth of +/- 6 years that I use for my estimates, this sample is restricted to men who graduated high school between 1999 and 2009.

I show the discontinuities in educational attainment graphically for cohorts choosing to attend university around 2004 in Figure 2. Just as with the cohorts around 1990, there is a jump up in the average years of education at 2004 in panel (a). After this, the average years of education begin to decline, but as mentioned earlier, this is because the younger cohorts have not yet had the time to obtain all the years of education they planned on.

With a more recent data set, the tail end of educational attainment would likely look flatter, although the initial jump in level around 2004 would remain. As expected, panel (b) shows there is no discontinuity around 2004 when looking at the percentage of men with at least a high school diploma. When looking at the percentage of men with at least a bachelor's degree in panel (c), there is a sizable jump around 2004, which looks to be about 20 percentage points. The tail end of the percentage with at least a bachelor's degree also begins to dip down by 2012, but as mentioned earlier, I count individuals currently enrolled in university as "holding" their degree, so the drop-off is not as sharp for later cohorts as it is in panel (a).

Figure 2: Differences in Education Outcomes around 2004



The results from my regression discontinuity specification are in Table 5. I include results for graduates around 1990 and 2004 (estimated separately). Columns (1) and (3) provide the average educational outcomes for the untreated cohorts (those making their higher education decisions during a relatively more stable time) as reference for the size of the effects estimated

in columns (2) and (4) around the cutoffs of 1990 and 2004, respectively. Applying the `rdrobust` package, which automatically includes a data-driven bandwidth selection (`rdbwselect`), I find an bandwidth of  $\pm 6$  years is optimal for both my 1990 and 2004 regression discontinuity. [Calonico et al. \(2014\)](#). This number does seem a little bit larger than one would expect, so I explore alternative specifications with smaller bandwidths in the robustness check section.

Table 5: Periods of Instability and the Impact on Educational Attainment

	Pre-1990 Mean (1)	1990 Estimate (2)	Pre-2004 Mean (3)	2004 Estimate (4)
Years of Education	11.57	1.010** (0.47)	12.69	0.602* (0.35)
At least Highschool	0.78	0.015 (0.09)	0.85	-0.072 (0.06)
At least Bachelor's	0.02	0.165*** (0.05)	0.44	0.171*** (0.06)
Observations		375		506

*Note:* Columns (1) and (3) provide the mean for untreated cohorts for comparison. Columns (2) and (4) estimate a local linear regression around 1990 and 2004 (separately) with an optimal bandwidth of 6 years. Both estimations include a time trend and all covariates discussed in the methodology section. Standard errors are in parentheses and clustered at the individual birth year and month level. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

Each of the rows in Table 5 represent a different measure of educational attainment. As expected, I do not find any statistically significant impact of delaying the draft on attaining at least a high-school diploma in either 1990 or 2004. However, I find that the cohorts making the decision to attend university after 1990 achieved about a year more of education on average than the cohorts choosing to attend university prior to 1990. Gaining a year of education is a tremendous increase for a policy, and shows just how strongly the opportunity to delay the draft impacted men's higher education decisions. The increase in average years of education is smaller around 2004, but is still more than half a year's increase and could be driven by the fact that younger cohorts have not had the time to pursue all the education they would like to.

For both 1990 and 2004, I find a strong impact on the percentage of men who received at least a bachelor's degree. On average, the post-1990 cohorts

saw a 16 percentage point increase in the percentage of men who had at least a bachelor’s degree, with a similar 17 percentage point increase for the post-2004 cohorts. Put another way, cohorts graduating high school during times of uncertainty were nearly 5 times as likely to receive their bachelor’s degree. This is a large increase and suggests that the highly unstable situation around 1990 and 2004 in Ukraine created a powerful incentive for men to take advantage of the draft deferment from attending university.

The opportunity to delay being drafted until after graduation provided a valuable means of achieving safety in the present for men during politically unstable times around 1990 and 2004. A lack of confidence in the future was enough to create a roughly 16 percentage point increase in the percentage of men who pursued tertiary education in cohorts that made the decision to apply to university around those years. Whether or not this decision was followed by attending quality universities and useful majors/tracks is a different case. It appears that payoffs in the future from attending a more prestigious university or studying a major with better labor prospects were nowhere near as high as the payoffs from being safe today and for the foreseeable future.

## 7. Robustness Checks

Following the guidelines for alternative confidence intervals suggested by [Kolesár and Rothe \(2018\)](#), I present my main estimates using `rdhonest` in Table 6 below. In the case of both the 1990 and 2004 regression discontinuity specifications, my standard errors increased a small, negligible amount. However, my estimates remain consistent and highly statistically significant.

The wider the bandwidth in a regression discontinuity design, the higher the chances that the individuals on the two ends furthest from the discontinuity are significantly different. Due to the already small size of my data set, the large bandwidth of  $\pm 6$  years selected by `rdbwselect` helps maximize power. However, this does feel like a fairly wide frame of reference. As a robustness check, I include different bandwidths in Table 7 for the cohorts choosing to attend university around 1990 and 2004. Around both 1990 and 2004, the effect of the delay in the draft is larger with a smaller bandwidth. This is expected, since these cohorts are the closest to the cutoff, when political instability was at its highest in Ukraine. I lose statistical significance for years of education estimates around 2004, but this is likely due to the same issue mentioned earlier, that individuals graduating closer to the survey year have not had the opportunity to gain as much total education as earlier co-

Table 6: Robustness Check: Alternative Confidence Intervals Using Rdhonest

	Estimates around 1990		Estimates around 2004	
	(1) Original	(2) Rdhonest	(3) Original	(4) Rdhonest
Years of Education	1.010** (0.47)	1.261** (0.54)	0.602* (0.35)	0.853** (0.46)
At least Highschool	0.015 (0.09)	0.052 (0.11)	-0.072 (0.06)	-0.054 (0.07)
At least Bachelor's	0.165*** (0.05)	0.188*** (0.05)	0.171*** (0.06)	0.221*** (0.09)
Observations	375	375	506	506

*Note:* All columns estimate a local linear regression around 1990 or 2004, with an optimal bandwidth of 6 years and include a time trend and all covariates. Columns (1) and (3) provide the original estimates with the robust standard errors provided by rdrobust, while columns (2) and (4) apply the alternative confidence intervals via rdhonest. Standard errors are in parentheses and clustered at the individual birth year and month level. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.0

horts. Overall, it appears that if anything, using a larger bandwidth of +/- 6 years underestimates the effect of delaying the draft on educational attainment (a considerable takeaway when the effect I find in my main estimates is already so large).

Table 7: Robustness Check: Alternative Bandwidths

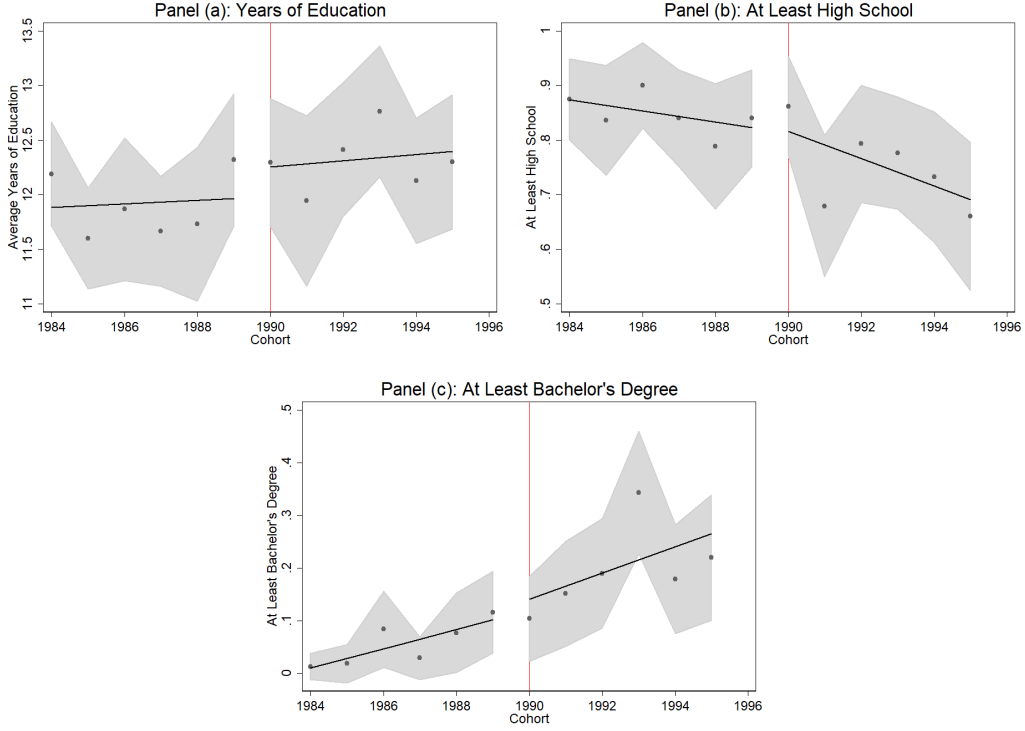
	Estimates around 1990			Estimates around 2004		
	(1)	(2)	(3)	(4)	(5)	(6)
	BW of 6	BW of 5	BW of 4	BW of 6	BW of 5	BW of 4
Years of Education	1.010** (0.47)	1.255** (0.55)	1.440** (0.68)	0.602* (0.35)	0.571 (0.39)	0.684 (0.47)
At least Highschool	0.015 (0.09)	0.052 (0.10)	0.052 (0.12)	-0.072 (0.06)	-0.077 (0.07)	-0.088 (0.08)
At least Bachelor's	0.165*** (0.05)	0.169*** (0.06)	0.186*** (0.07)	0.171*** (0.06)	0.168*** (0.06)	0.218*** (0.07)
Observations	375	310	236	506	424	328

*Note:* All columns estimate a local linear regression around 1990 or 2004 and include a time trend and all covariates. Columns (1) and (4) provide the original estimates from my main specification around 1990 and 2004 using the optimal bandwidth of 6 years for comparison. All other columns show alternative estimates with smaller bandwidths. Standard errors are in parentheses and clustered at the individual birth year and month level. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.01.

While I am unaware of any simultaneous programs related to education that might likewise cause a discontinuity around 1990 and 2004, I double check this by observing educational outcomes for women. Any sudden changes in how easy it is to be accepted in universities or increases in anticipation of joining NATO and thus having potentially better labor outcomes should be reflected in educational attainment for women as well. This is especially true given that women traditionally have much higher levels of education than men do in Ukraine. For example, the surge in private universities suddenly opening their doors after Ukraine's independence should theoretically lead to a sudden increase in educational attainment for both men and women. Figure 3 demonstrates that there is no noticeable jump in any of the education outcomes for women around 1990, which is to be expected, since women are not drafted in Ukraine and a policy delaying the draft would have no impact on them. This also suggests that there were no

other sudden changes in the availability of education and other education-related policies.

Figure 3: Regression Discontinuity in Women's Education Outcomes around 1990



I also check educational outcomes for women around 2004. Figure 4 shows the results graphically; at best, there is a kink in average educational attainment around 2004, but still no discontinuity for any of the education outcomes I look at. I run regressions around 1990 and 2004 for women to check that the estimates match the lack of a discontinuity graphically. I follow the same specifications as I do for men and present the results in Table 8. None of the estimates are statistically significant and support the idea that there were no jumps in expectations of better labor outcomes or education policy changes around the two cutoff years I focus on. Given these results, one may think women to be an ideal control group to instead run a difference-in-difference specification. However, women's education is on a completely different, rapidly increasing trend line during these decades, and would unfortunately serve as a poor control for men.

Figure 4: Regression Discontinuity in Women's Education Outcomes around 2004

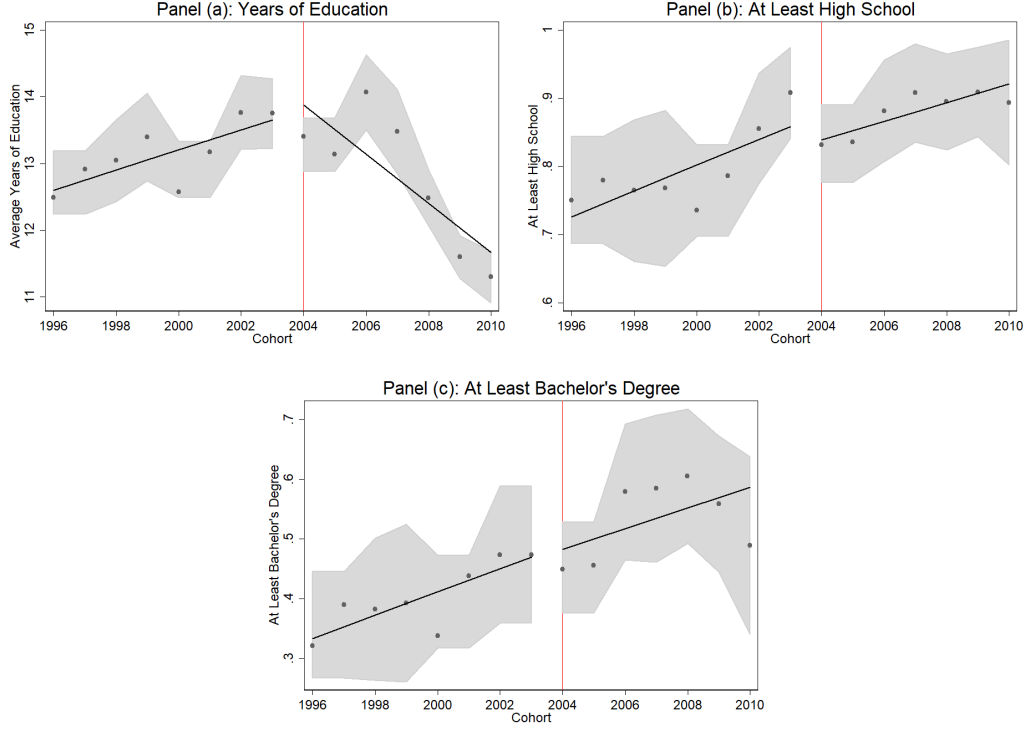


Table 8: Robustness Check: Political Instability and Educational Attainment for Women

	Pre-1990 Mean (1)	1990 Estimate (2)	Pre-2004 Mean (3)	2004 Estimate (4)
Years of Education	11.85	0.303 (0.53)	13.34	-0.686 (0.46)
At least Highschool	0.84	0.081 (0.08)	0.81	-0.031 (0.03)
At least Bachelor's	0.07	0.081 (0.08)	0.43	0.130 (0.10)
Observations		375		506

*Note:* Columns (1) and (3) provide the mean for untreated cohorts for comparison. Columns (2) and (4) estimate a local linear regression around 1990 and 2004 (separately) with an optimal bandwidth of 6 years. Both estimations include a time trend and all covariates discussed in the methodology section. Standard errors are in parentheses and clustered at the individual birth year and month level. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$



Lastly, I check my estimates when including a higher polynomial fit in Table 9. I use a first degree polynomial as the default, but check a second and third degree polynomial specification instead. Columns (1) and (4) show the main estimates (using a first degree polynomial) from Table 5 for comparison. In particular for the percentage of men with at least a bachelor's degree, I find much larger estimates that still remain statistically significant when using a higher degree polynomial. However, this is not reflected in the years of education and overall, it is not particularly convincing that a second- or third- degree polynomial is a better fit.

Table 9: Robustness Check: Alternative Polynomial Fit

	Estimates around 1990			Estimates around 2004		
	(1)	(2)	(3)	(4)	(5)	(6)
	1st degree	2nd degree	3rd degree	1st degree	2nd degree	3rd degree
Years of Education	1.010** (0.47)	1.849** (0.89)	1.377 (1.54)	0.602* (0.35)	0.721 (0.61)	1.336 (1.18)
At least Highschool	0.015 (0.09)	0.143 (0.17)	0.172 (0.37)	-0.072 (0.06)	-0.106 (0.11)	-0.042 (0.20)
At least Bachelor's	0.165*** (0.05)	0.193** (0.08)	0.278** (0.12)	0.171*** (0.06)	0.190* (0.10)	0.495** (0.23)
Observations	375	375	375	506	506	506

*Note:* All columns estimate a local linear regression around 1990 or 2004 using a 6 year bandwidth and include a time trend and all covariates. Columns (1) and (4) provide the original estimates from my main specification around 1990 and 2004 using a first degree polynomial. All other columns show alternative estimates with a second or third degree polynomial specification instead. Standard errors are in parentheses and clustered at the individual birth year and month level. \* $p < 0.10$ , \*\* $p < 0.5$ , \*\*\* $p < 0.0$ .

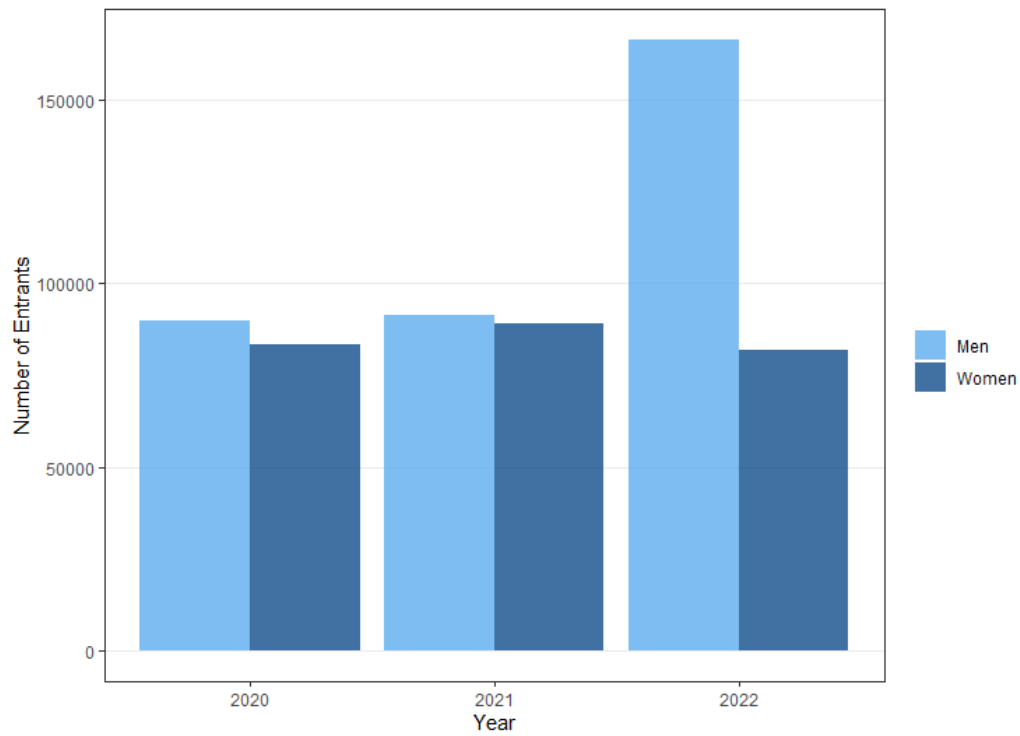
## 8. Discussion

Unfortunately for Ukraine, 2004 was not the last instance of political instability. After Russia's annexation of Crimea in 2014, Ukraine was hit by a Russian invasion in February 2022, starting a war that is still ongoing. In March of that year, President Zelensky signed a decree that made all men ages 18 and up eligible for conscription and prevented any men ages 18 - 60 from leaving the country. However, the policy that allowed full-time university students to delay the draft until after graduation remained in place ([Verkhovna Rada of Ukraine, 2022](#)). While micro-data on education and labor outcomes of Ukrainian citizens has not been gathered in the recent decade, there was a push in 2020 from the Ukrainian Ministry of Education and Science to collect uniform data on universities and their entrants. This allows me to check if my predictions on instability and higher education from the previously unstable time periods in Ukraine's history still hold in a more recent setting and are not unique to the time periods I study.

Using restricted data from the [Ministry of Education and Science of Ukraine \(2020 - 2022\)](#), Figure 5 shows the totals of first year entrants to private universities at the start of each academic year. I specifically focus on private universities because of the much more competitive nature of public universities in Ukraine. As mentioned in an earlier section, public universities are perceived as more prestigious and have fewer seats available. For individuals seeking to avoid the draft, neither the quality of the university nor the major matters. And with a much higher chance of being accepted in a private university, I expect that any sudden changes in university enrollment would mainly be reflected in private universities. As Figure 5 shows, after Russia's invasion in early 2022, the number of male entrants nearly doubled that year, while the number of female entrants stayed the same.

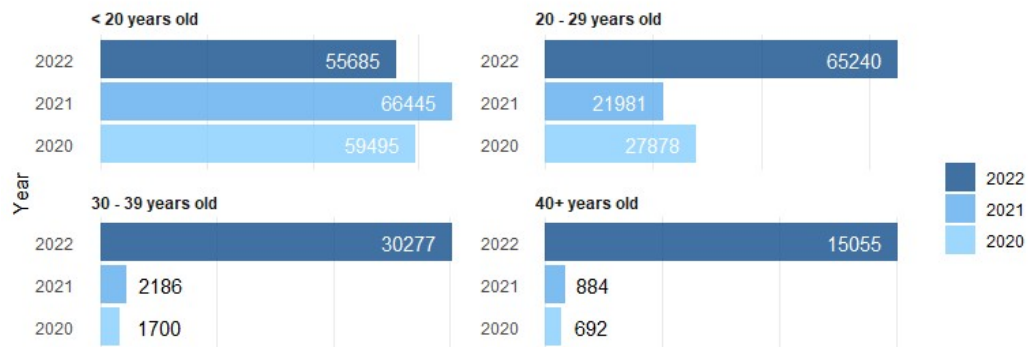
Older cohorts were the driving force behind this sharp increase in entrants, as can be seen in Figure 6. While men could not previously be conscripted once they were older than 27, now all men are suddenly faced with the same dilemma as when they originally graduated high school. Except, having already made the decision about higher education earlier in their lives, these men are already well established in the labor market and the earnings they must forgo are much higher. In order to qualify as a full time student and receive a draft deferment, an individual may not work full-time and must attend daytime classes. Given how most standard bachelor's degrees take 4 years, this means at least 4 years without a steady flow of income. Men are

Figure 5: Number of Private University Entrants by Gender



Source: Ukraine Ministry of Education and Science

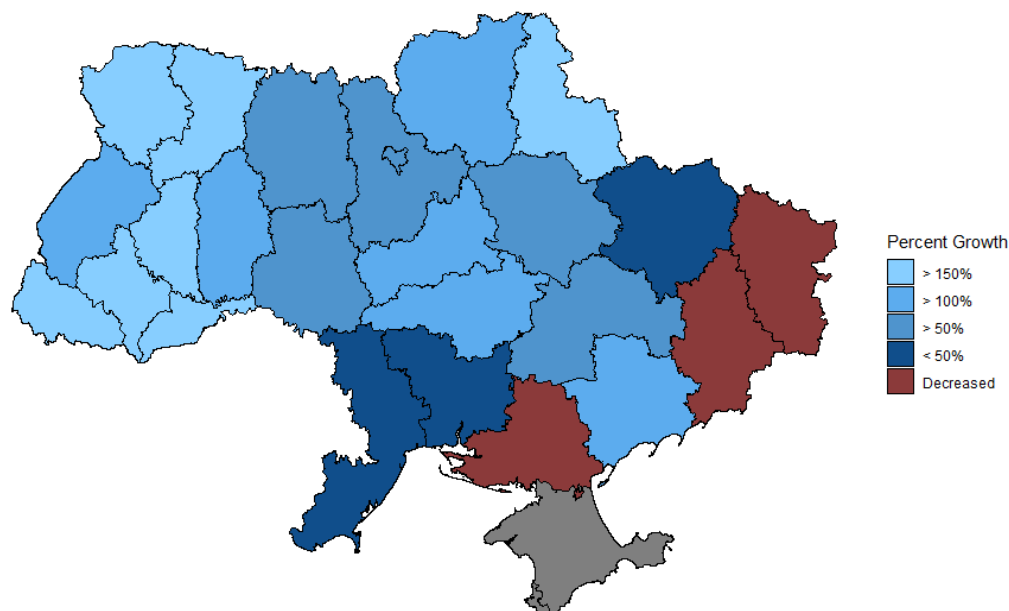
Figure 6: Number of Male Private University Entrants by Age



Source: Ukraine Ministry of Education and Science

generally the primary breadwinners in Ukraine; prior to the war, the labor force participation rate for working age women was particularly low at 53 percentage points, compared to the 65% labor force participation rate for men ([Anastasia et al., 2022a](#)). For married men, it is possible that the main bread-winning role shifted to their wives. The fact that so many households chose to give up their main source of income for several years highlights just how important safety is and may potentially put a lower-bound on how much households are willing to pay (lose in this case) to achieve it. On a larger scale, with so many men unable to work, either due to active duty or avoiding the draft, the labor supply will likely see a dramatic shift to include more women. Unfortunately, there is no data currently available to see shifts in the composition of the labor market at the moment, but this would be interesting to explore in a future paper.

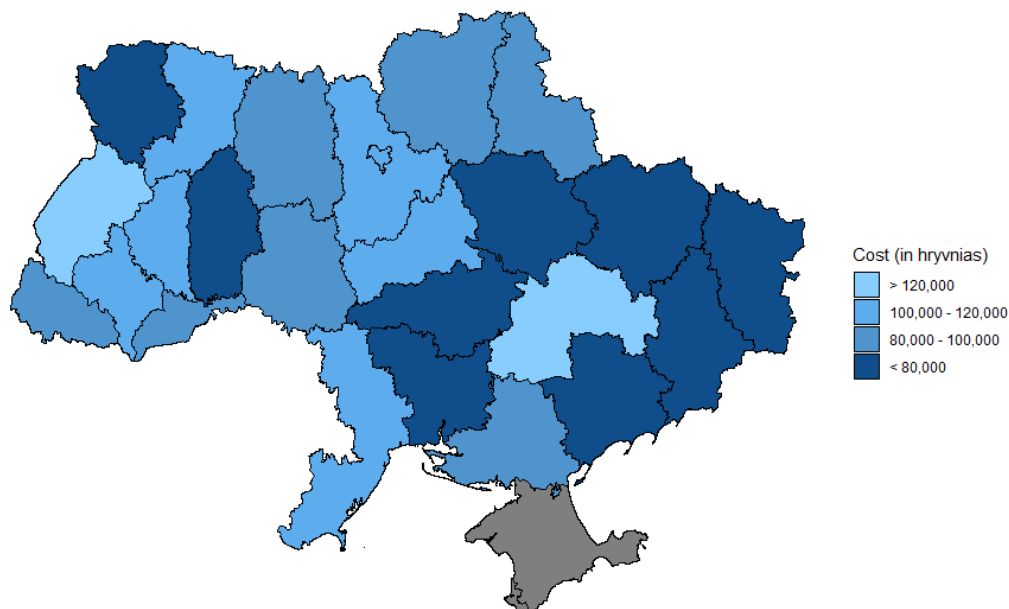
Figure 7: Percentage Increase of Male Private University Entrants from 2021-2022 by Region



*Source:* Ukraine Ministry of Education and Science

The increase in university entrants is not uniform throughout the country. With the eastern regions of Ukraine under direct invasion, refugees fled westward. About one third of the population left their homes, with most

Figure 8: Average University Price by Region



moving to another region ([Anastasia et al., 2022b](#)). It should come as no surprise that the increase in university entrants is more heavily concentrated in safer regions of Ukraine. Using region-level shape files put together by [Hijmans, Robert J. \(2015\)](#) and the same entrant data from the [Ministry of Education and Science of Ukraine \(2020 - 2022\)](#), I plot the percentage increase in male entrants from the start of the 2021 academic year to 2022 in Figure 7. The regions furthest to the west have some of the largest increases in their entrants at over 150%, while the regions heavily hit by fighting or located close to it saw a decrease. Note that Crimea is grayed out as it has not been under Ukraine's control since Russia annexed it in 2014.

Such a large increase in demand for universities towards the west would inevitably lead to a price increase. Using a the government-sponsored website, [Education.ua \(2023\)](#), I compiled the average university price (by major) of studying for all four years at a university in Ukraine. These prices come from the tuition posted for the 2023 - 2024 academic year across 298 universities (both public and private), excluding medical schools, law schools, and art schools, which all have rigorous admission policies and are much more expensive than standard universities. Very few universities kept data

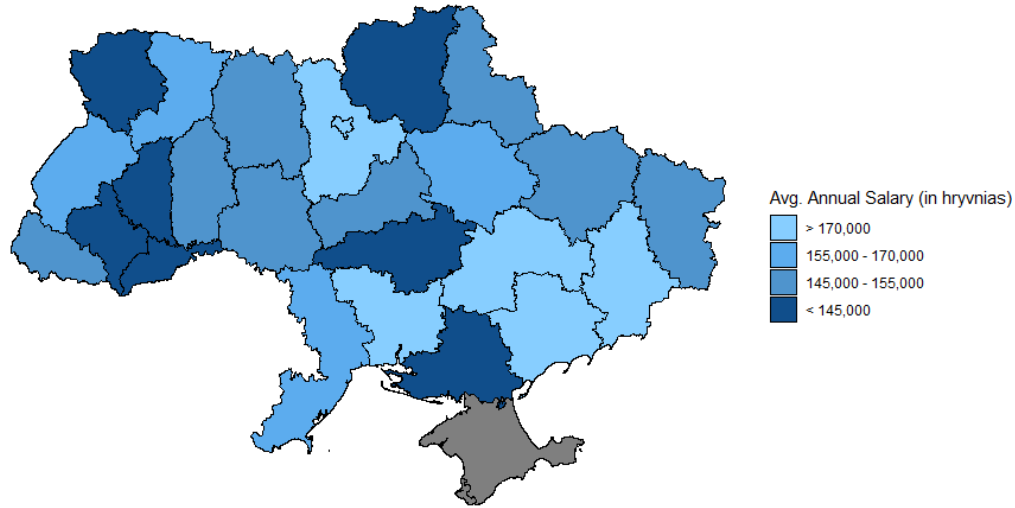
on their website about tuition prices from previous years. However, 2023 is only one year from the war and should accurately reflect the time it would take universities to adjust their prices to the increased demand from the previous year. Figure 8 shows the average university price across Ukraine, ranging from 60,000 to over 120,000 Hryvnias (equivalent to roughly \$1,600 and \$3,200 respectively in 2023); the much lighter, and thus more expensive areas, are mainly located to the west, where the number of entrants increased the most too.

To put the values into perspective, I use the most recent salary data available in Figure 9 to show the average salary by region ([State Statistics Service of Ukraine, 2022](#)). First, this noticeably looks like an inverse of the university prices in Figure 8. Some of the wealthiest regions in Ukraine are in the region the capital is in, Kyiv, and towards the east. Eastern Ukraine is far more industrialized and has richer and better farmland, although many of these industries have been ground to a halt while fighting continues ([Yakov Feygin, 2014](#)). In terms of average salary as compared to university prices, 145,000 Hryvnias is about \$3,900 while 170,000 Hryvnias is \$4,600. The cost of attending 4 years of university would cost a bit less than one year's salary for the average citizen, assuming they do not choose the most expensive university/major.

For individuals that are older and have had the chance to save, this is quite feasible, although it will likely eat up a solid portion of their savings and retirement fund. For younger individuals in their 20s, who likely have not had the chance to save as much, the impact will be devastating. Most likely, they will have to take out loans to cover the tuition costs. And while not an impossible amount, this is still a significant sum of money that will take away from saving towards a house and retirement later in life. Likewise, the older cohorts may have to work longer after the war to make up for the lost wages initially.

The impact of the war on prices and interest rates is also an important factor to consider. Many businesses, particularly those in industries such as metallurgy, mining, and engineering, have been unable to export their goods due to supply chain issues. This has led to more than half of all Ukrainian businesses decreasing staff and a bit over a third paying lower wages by the end of April, 2022. The situation is made even worse from the high inflation which usually accompanies conflict (and its funding). While variable across the country, raw food prices increased by 28.9 percent and fuel by 57.8 in the year after the war started. The National Bank of Ukraine also increased

Figure 9: Average Salary by Region



its main interest rate in June, 2022 from 10 to 25 percent. The goal was to stabilize the exchange rate and increase the attractiveness of investments in Ukrainian assets (Slaviuk and Bui, 2022). But, this creates an even heavier cost for individuals who would need to take out loans to pay for university.

Meanwhile, for the households that gave up their main source of income for safety, the much higher cost of living will sap away savings even faster. Many individuals will likely have to work longer before retiring in order to make up for these losses. Perhaps, the additional degree in higher education may even help some individuals to find better jobs as the labor market adapts to the war and its aftereffects. It is also just as likely that Ukraine will experience an even more severe mismatch in the labor market. While Ukraine's population has one of the highest shares of tertiary education in the world, average labor productivity and per capita income have remained extremely low relative to advanced economies with a similar stock of human capital. One of the main reasons for this is the persistent skill and education-job mismatch in the Ukrainian labor market. While rapid changes in Ukraine since the early 1990s rendered the skills of many adult workers obsolete, there was a simultaneous increase in the oversupply of university graduates with

irrelevant formal education and skills. The sudden availability of tuition fee-based education in public universities and alternative private universities in the 1990s opened up a lot more seats. The consequence is that several universities suffered a decrease in quality, focusing on producing graduates with diplomas but not skills (Kupets, 2016).

The literature on this topic focuses on the increase in universities as the reason for higher educational attainment in Ukraine. My work shows that while this contributed to a steady increase in educational attainment, the goal of evading the draft in times of uncertainty/instability was a key driver in sharp and sudden increases in university attendance for men. This increased demand for higher education was made possible by the willing and available increase in supply (without which, it would be much more difficult for that many men to get a university deferment from the draft). While private universities were eventually held to much stricter standards after the initial boom in the 1990's, there continues to be no shortage of private universities offering seats for men attempting to escape the draft today. Even if the diplomas received may be higher quality, it is highly likely that the degrees pursued as a means of avoiding the draft are not those that will be in demand in the next coming years. Nonetheless, as long as there is an available supply of universities, the powerful incentive that draft deferment with higher education provides in the face of political instability (whether that be at an intensity of a war or simply the anticipation of one) will have long-lasting impacts at both the individual- and nation-level.

The most recent addendum to Ukraine's draft deferral policy provides a potential solution to draft avoidance through higher education. As of May 18, 2024, the deferral does not apply for men receiving a second or third bachelor's degree. Currently, a draft deferment is granted only to students who are studying full-time to obtain a higher level of education than the previous one (i.e., if an individual already has a bachelor's degree, he must study at a master's degree level or higher to obtain the deferral). Graduate programs have a higher barrier to entry, but likewise, have a longer period of potential safety if one directly pursues a doctoral degree. It is too soon to observe the impacts of this policy change on graduate student enrollments and thus is beyond the scope of this paper for now. However, the potential impacts on the labor market mismatch may be even more severe if a large enough percentage of the population motivated by the strong desire to avoid the draft manage to enroll in graduate programs (assuming enough schools are willing and able to expand their graduate programs). What is clear for



now is that the desire for personal safety is incredibly powerful; while this section has by no means been an accurate estimate of just how much people value their safety, it does provide some basic insight into how much people are willing to give up to stay safe for the foreseeable future.

## 9. Conclusion

Several countries currently have compulsory military service laws in place, typically implemented via draft. While some are considering abolishing these laws, other countries are debating whether or not to reinstate them, especially in the face of conflict, such as with the current war between Russian and Ukraine. With many of these conscription policies offering some form of leniency for students, this creates an interesting set of incentives to pursue higher education. Yet, there appears to be some discord in the literature on whether or not compulsory conscription increases university enrollment or not. I look at the changes in university incentives that come from delaying military conscription. While this creates incentives to attend university now, especially during times of instability in a country with an uncertain future, this comes at the cost of attending a less prestigious university and/or studying a major with worse labor outcomes.

Using a regression discontinuity design around two separate instances of instability in 1990 and 2004, I estimate the effect of having the opportunity to delay the draft until graduation on higher educational attainment for men. I find large, statistically significant increases in educational attainment for cohorts making the decision during and shortly after these unstable periods of time. It would seem that for several men, the safety of the present heavily outweighed the loss of earnings in the future, leading them to apply to lower quality universities and less in-demand majors. This is unsurprising – if one’s country is on the brink of collapse, then one does not think too far ahead about what will be and rather focuses on being safe right now. The unexpected result of this, due to the specific set of circumstances with a draft deferment for university students and the number of universities rapidly increasing following Ukraine’s independence, is the significant increase in the number of men with higher levels of education.

The presence of actual conflict along with draft deferment creates a unique situation where older cohorts are also faced with a decision between current earnings and their safety. Except, having already established themselves in their careers, going to university at this point has a much higher opportunity

cost. As the recent data on university entrants shows, safety in the present continues to be highly desirable, even at the cost of a lower quality of life for individuals and their households. With more data hopefully available on actual educational attainment in the future, it will be interesting to recreate my regression discontinuity approach for cohorts who chose to attend university around 2022. With the most recent addendum to the draft deferment policy, it would be even more interesting to study the impacts on graduate enrollment as the war continues. Seeing how many individuals would be willing to go through the higher costs of graduate education can give a closer estimate to how much people value their safety in times of crisis. All of this leaves space for future work to study the resultant shifts in the labor market composition, both due to so many men suddenly being unable to work and their re-qualification to other fields and potentially higher degrees (raising a question of just how applicable these new degrees will even be in a recovering, post-war economy).

## **Appendix**

The appendix provides additional information as well as tables and figures to support this paper's findings. Section A includes more historical background to better understand the political climate of Ukraine and the Soviet Union around 1990 and 2004. Section B has additional tables referenced in the paper and Section C has additional figures.

## Appendix A. History

1990

Faced by the Soviet-Afghan war, which started in 1979, the Soviet Union found itself with a noticeably dwindling pool of available draftees for 1980, mainly due to the drop in 1961 - 1969 birth rates. Prior to this, university students enjoyed fairly generous deferments: while all able-bodied male citizens were expected to serve two years in the armed forces, university students only had to serve 18 months and were not called up until after graduation. However, in order to make up for the shortfall of draftees during the war, student deferments were suspended starting from 1982. Any men between the ages of 18 and 27 could be drafted on a semi-annual basis, either in late spring or late fall. University students often had their studies interrupted for nearly two years, leaving them behind and scrambling to catch up.

As part of the *Perestroika* and the movement to finally bring the Soviet-Afghan war to an end, Gorbachev passed a USSR-wide law on July 11th, 1989, which delayed the draft for all full time students in universities and college-level institutions until they completed their studies. The rationale behind this movement was to transfer resources from “guns to butter,” i.e., produce a more educated populace who would contribute to the labor force of the USSR and strengthen the economy. This included a movement towards a smaller, professional military, manned entirely by volunteers, which would eventually eliminate the need for a draft entirely. Gorbachev’s goal was never realized due to the unraveling and eventual fall of the USSR a few years later ([Odom, 1998](#)).

While Ukraine officially became independent from the Soviet Union on August 24, 1991, the movement towards this independence started years earlier. Gorbachev’s reforms during the *Perestroika* had opened up small political spaces for the Ukrainian dissident movement. What started as a series of informal groups scattered across the country quickly consolidated into a powerful opposition against the Communist Party of Ukraine (CPU) by 1990. At the head was the Ukrainian Popular Movement for Restructuring (the Rukh). The CPU attempted to prevent the publication of the Rukh draft program in every possible way, but the Rukh kept the CPU on the defensive, forcing it to move in the direction of accommodating public opinion ([Kuzio, 1999](#)). As with any transitional period, however, there was no shortage of uncertainty for what the future held at the time. Many people feared that these political developments might lead to an explosion of violence.

The system could hit back, leading to mass repressions. There could be a civil war breaking out Yugoslav-style between Eastern and Western Ukraine, traditionally split between the “Catholic” and Pro-European/Polish West and the “Orthodox” and Pro-Russian East. The Soviet Union Ministry of Interior Affairs further incited fears by issuing warnings that there could be imminent ethnic violence against Russians and Jews inspired by the Rukh (Hrytsak, 2010). Fortunately, Ukraine did not spiral into an outbreak of violence and continued on to take the first steps towards a more democratic governing system.

*2004*

The close ties with Russia were not easily broken. Ukraine grandfathered in a lot of laws and policies that were in place under the USSR. The president and the parliament of Ukraine continued to be heavily influenced by Russia and several high ranking officials in Ukraine were Russian. In the first decade after gaining independence, Ukraine suffered through an economic slump, but did not do much to move away from Russia in order to not “rock the boat.” Dissatisfaction was growing, however, and came to a head during the monumental election year of 2004 (the Orange Revolution). A constitutional reform in April 2004 prevented the president at the time, Leonid Kuchma, from serving more than 2 terms. In his place, Kuchma and the Russian President Vladimir Putin fiercely promoted Viktor Yanukovych (the Prime Minister under Kuchma’s presidency) for the upcoming presidential election. A representative of the Donetsk oligarchic elite, Yanukovych had support from the two most populous provinces in the East, along with support from the oligarchs, who wanted to maintain the status quo. His main opponent was Viktor Yushchenko, who ran as an independent and was pro-Western (having EU and US support), pledging to move Ukraine closer to the EU with the goal of joining NATO. Yushchenko experienced a lot of popular support (in contrast to Kuchma’s unpopular presidency), but was strongly disliked by the oligarchs. From 1999 to 2001, Yushchenko had served as Prime Minister of Ukraine, and became known for his reforms which promoted privatization, lowering inflation, balancing the budget, and reducing government bureaucracy. While these reforms benefited the country as a whole, they hurt the oligarchs, and he ended up being removed from office in April 2001 by parliamentary vote. Due to Yushchenko’s popularity, the Ukrainian authorities recognized that if they allowed a free and fair election in 2004, the opposition candidate (Yushchenko) would win an absolute ma-

jority in the first round. This motivated the regime to launch the dirtiest campaign since the country's independence ([Kuzio, 2005](#)).

The first round of the election was on October 31, 2004, with most votes divided almost equally between Yushchenko and Yanukovych. The runoff vote for the election was held on November 21 and it became obvious that the regime had falsified the results when Yanukovych was declared the winner. Authorities had completely underestimated the outrage that a stolen election would create when crowds swarmed Kyiv's Independence Square and its surrounding streets, numbering more than half a million. This sparked the beginning of the Orange Revolution: a series of protests that followed throughout November into early January of 2005, until a re-vote was ordered by Ukraine's Supreme Court for December 26, 2004. Yushchenko was declared the official winner on January 10th, 2005, ending the Orange Revolution ([Benoit and Klyukovski, 2006](#)).

Just as with the movement towards Ukraine's independence, the tensions the country felt were at an all-time high before the election even happened. In order to evoke a violent counter-response from the opposition, the authorities employed a strategy of violence ("directed chaos") from July to October 2004 during the Ukrainian presidential election campaign. This included inciting regional and inter-ethnic conflict, assassinations, violence against the opposition, counter-revolution, and use of the security forces. A secretly taped conversation between a member of the Yanukovych shadow campaign and a Russian political technologist revealed discussions about how the authorities should incite conflict and pit Western against Eastern Ukraine. The goal was to destabilize the situation in the regions of Ukraine and drag Yushchenko into it. On top of this, Yushchenko was nearly fatally poisoned on September 5th, 2004, causing him to lose a month of campaign time. A second assassination attempt was uncovered in the form of a planned bombing of his election headquarters. Russia provided extensive covert and overt support for the Ukrainian authorities and as a result, Ukraine was close to violence on a number of occasions both during the election campaign and during the Orange Revolution. Yushchenko and his supporters staunchly maintained a strategy of non-violence throughout all of this time and fortunately, bloodshed and a possible civil war were avoided in the end ([Kuzio, 2010](#)).

## Appendix B. Covariates

I control for parental involvement in student education throughout grade school as a way to account for how focused on education the individual’s family is / how much education is stressed in that household. Parents who think education is important are much more likely to pay attention to how their child is doing in school, which in turn may influence that child’s decision to continue on to higher education. I also control for the region an individual was born in as well as the type of settlement (a village, city, or town). While under the Soviet Union a minimum school quality was rigorously enforced, village schools began to degrade after the fall of the Soviet Union and typically have worse funding and educational outcomes. Along with this, I control for whether or not the individual considered themselves a good student relative to their class (an average student, above average, etc.). This perception of self would likely influence whether or not the individual thought he had a chance at getting into the university he chose. Whether or not a student had to work prior to age 15 is also an important indicator for family socioeconomic background. The Soviet Union provided a small stipend, but if a family needed its children to work when they were under age 15, this stipend would likely not be enough to help the family get by. It appears that in both groups, a minority (only about one tenth) of the sample worked before age 15.

I also include a measure of risk-taking behavior. The survey asked a hypothetical question for participants: if they were offered 100,000 Hryvnias (equivalent to \$12,516 USD in 2012), and whatever amount they put in the lottery had a 50% chance of being doubled, what amount would they include [The World Bank \(2023\)](#). I defined the “risk takers” as individuals who would put at least 50% of that amount into the lottery. In addition to this, I look at a measure of time discounting. Survey participants had to choose hypothetically receiving 3,600 Hryvnias (\$451 USD) today or 7,200 Hryvnias (\$901 USD) one year from now. The “patient” individuals are the ones who would wait one year for the higher amount. These measures are important to control for, since risk-loving individuals are more likely to take chances with higher ranked universities while individuals that heavily discount the future are likely to choose a worse university/major in favor of getting draft deferment immediately.

Finally, I include controls for parent education. Parents with a higher level of education are not only likely to promote the value of education, but

also encourage or expect their children to continue their studies in university. Given that a regression discontinuity design is power hungry and that I have less observations for the education levels of both parents, I create a composite control. If both parents have a higher level of education (at least a bachelor's degree), I record this as "2," if only one parent has at least a bachelor's, I record this as "1," and if neither parent has at least a bachelor's degree, I record this as a "0." In this way, even if the educational attainment is missing for one parent, I still have an observation for parental education overall for each individual.

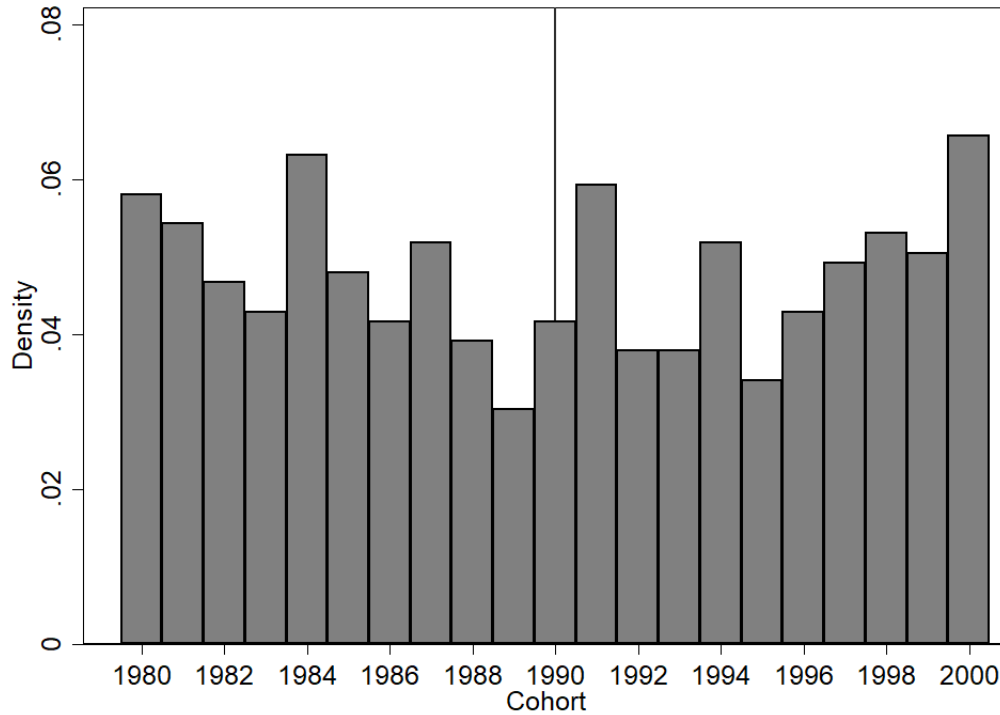


## Appendix C. Additional Figures and Tables

### *Appendix C.1. Density of Cohort Observations*

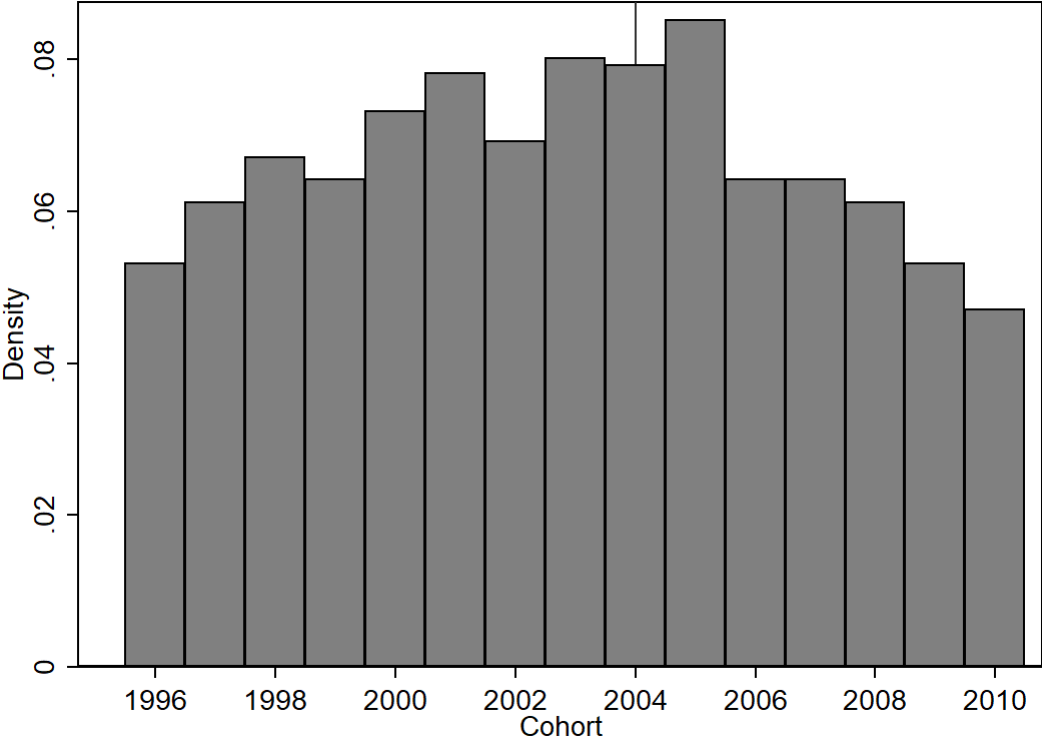
Figures C.1 and C.2 below show the density for each cohort group included in my analysis. I have less observations from individuals who made the decision to attend college in 1989, but I do not believe this is due to anything systematic, as I similarly observe fewer individuals in the 1992, 1993, and 1995 cohorts. Participants for the Ukrainian Longitudinal Monitoring Survey were chosen at random and no specific age group/cohort was particularly focused on. However, this could partially be a reflection of the fact that birth rates were lower for the 1980 cohorts and decreasing [Odom \(1998\)](#), thus leaving a smaller pool of individuals to survey from those cohorts. Meanwhile, the distribution of observations for the cohorts around 2004 is generally normal.

Figure Appendix C.1: Density of Cohort Observations around 1990



In a more formal, direct test, I apply [McCrary \(2008\)](#) to double check for manipulation of the running variable around the two cutoff years I look

Figure Appendix C.2: Density of Cohort Observations around 2004



at. I fail to reject the null for the 2004 cutoff, suggesting manipulation is unlikely. However, I find a coefficient of 15.62 with a standard error of 2.39 and a p-value of 0.018 for the 1990 cutoff. Successfully rejecting the null hypothesis in the McCrary test suggests possible manipulation. In this case, for there to be manipulation in cohort size, people would have had to be aware this conscription policy change would occur specifically in 1989 two decades earlier in order to change their fertility accordingly. The early 1970's in the Soviet Union were not marked by any particular conflict, excess mortality, or a recession. It is possible that the 1973 oil crisis, which initially benefited the Soviet Union as an exporter of oil to the West, improved economic outlook and increased fertility around that year (leading to a larger graduating cohort in 1990) [Ofer \(1987\)](#). Regardless, the McCrary test is unlikely to have failed due to manipulation related to conscription policy; in this case, it is either a statistical anomaly, or can tentatively be explained by positive economic outlooks surrounding the oil crisis in the Western world.

### *Appendix C.2. Smoothness of Covariates*

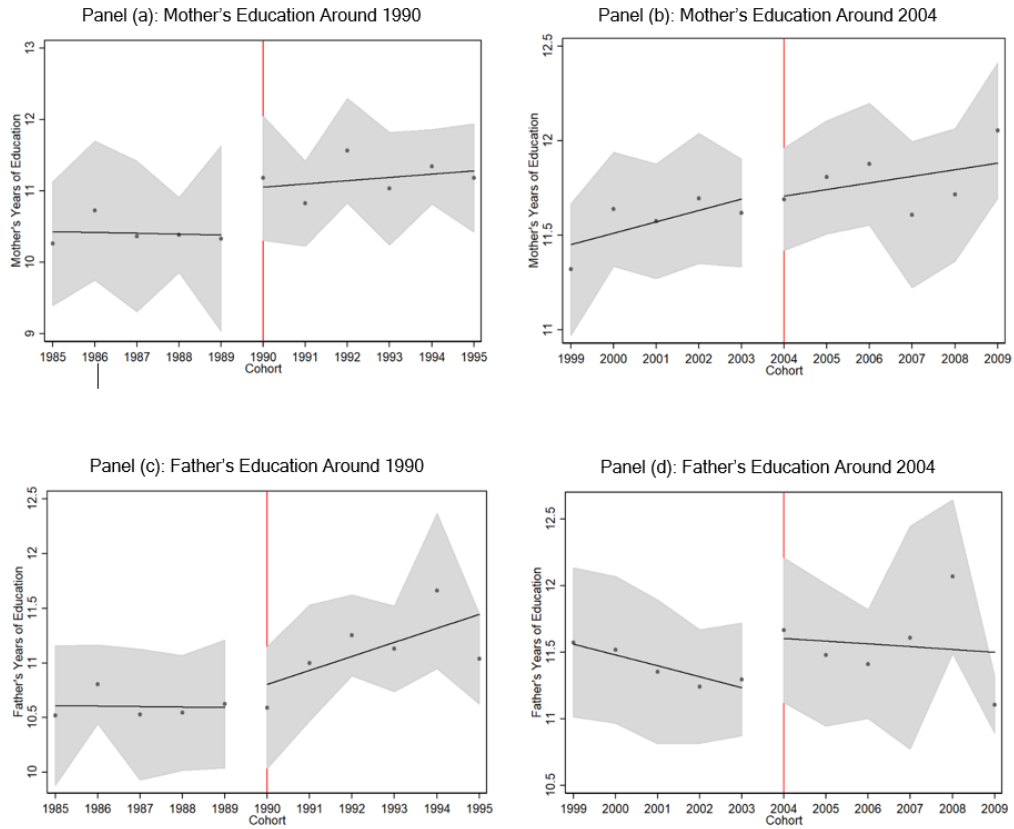
Figure C.3 shows that although the average values of these covariates have a statistically significant difference between the pre-1990 and post-1990 and pre-2004 and post-2004 cohorts for parental education, there is no discontinuity at either 1990 or 2004. I further test this by running running local linear regressions around each cutoff point with the outcome variable now being parental education. Table C.1 shows the results, with estimates around the 1990 cutoff presented in column (1) and estimates around the 2004 cutoff in column (2). Similar to my main specification, I include a 6 year bandwidth and control for the time trend. I do not find any statistically significant results, suggesting that parental education is not discontinuous at the cutoffs I use throughout this paper.

Table Appendix C.1: Regression Discontinuity Estimates around Parental Education

	(1) 1990 Estimates	(2) 2004 Estimates
Mother's Education	0.034 (0.28)	0.035 (0.18)
Father's Education	0.159 (0.26)	0.234 (0.18)

*Note:* All estimates follow the same framework as the regression discontinuity estimates in the main paper, with a bandwidth of 6 years and controlling for a time trend. Standard errors are in parentheses and clustered at the individual birth year and month level. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.01

Figure Appendix C.3: Smoothness of Parental Education around 1990 and 2004



*Note:* All figures include a regression of the running variable (cohort) on parental education, following the same framework as the regression discontinuity estimates in the main paper. The shaded area in each figure represents the 95% confidence interval around each regression.

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