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The Impact of Mandatory Military Service on Labor Outcomes. Evidence from Spain. *

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Abstract

Using Spanish administrative records, I study the impact of Military Service (MS) on several labor outcomes for men born between the years 1968 and 1973. To address a concern of endogeneity in MS, a national lottery is used as a source of variation. The results reveal, differently from OLS or Fixed Effects estimates of the impact of MS, that an allocation out of service through the lottery is associated with significant benefits. Firstly, being spared from service increases the probability of being in the labor market (1.6pp), the likelihood of being employed (1.7pp), tenure in the last job (0.15 years) and monthly earnings (1.9pp). Secondly, the effect is not restricted to the years of active service, but for extensive margins (employment and labor force participation), it wears off over the years. However, the impact on some earnings measures is present over the complete period under analysis. Thirdly, I present evidence that avoiding MS through the lottery is associated to an increase in labor market experience (0.2 years) and the likelihood of holding a professional or technical degree (2.8pp). Finally, I explore the heterogeneity across educational levels and whether location of service and military branch affect the size of the penalty.

Keywords: Military service, conscription surplus, labor market.

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1 Introduction

By using Spanish administrative data and a monthly panel that extends over 20 years, I study the impact of compulsory military service on labor outcomes for a sample of native male Spaniards born between the years 1968 and 1973. Specifically, a national lottery used to randomly allocate an excess of conscripts out of military duties is exploited to address the usual concerns of endogeneity in the treatment.

Despite the fact that some European countries, Spain included, abolished compulsory conscription at the turn of the century, a new scenario[1] has made some of these countries consider reinstating mandatory conscription, and others, to forgo its abolition.[2] The diversity of positions among policymakers with respect to military service is mirrored by widespread evidence in the academic literature about the impact of military service on different dimensions. In fact, there are several suspected channels behind the effect of mandatory military service on individual's working life.

Even if we restrict our attention to studies addressing the endogeneity in military participation, a great degree of heterogeneity in this labor penalty[3] is observed.[4] For the US, the evidence coming from the Vietnam draft lottery era reveals a considerable negative impact on labor market earnings associated to veteran status in the short-run (Angrist, 1990), however, this impact tends to wear off over time (Angrist & Chen, 2011; Angrist *et al.*, 2011[5]). Also for the US, but looking at the impact

[1]Some of these factors are related to the rise of terrorism or other threats to national security, together with increasing pressure for military resources in the context of an aging population. While the annexation of Crimea by Russia has provided some sectors in Eastern Europe with arguments for reinstating military service, among Western Europe voices supporting the return of some form of conscription, the arguments have been based on the values that could be promoted by military service (Bieri, 2015).

[2]See for example, http://www.straitstimes.com/opinion/the-return-of-military-national-service-in-europe

[3]Bingley *et al.* (2020), citing Albrecht *et al.* (1999), list three reasons for a labor penalty to be associated to this interruption. First, a loss of experience and its consequent effect on wages. Second, individuals who foresee this interruption might adjust their investment plans and occupational choice. Finally, a labor interrruption is associated with a human capital depreciation.

[4]For this review, I do not distinguish between peace and wartime military service although the effects can differ. First, beyond the direct effect on mortality, wartime military service is expected to be associated with a larger penalty on several dimensions. Second, in part due to this expected greater cost, governments have put in place programs to compensate these losses. Such programs, however, might reduce or enhance a negative effect of being a war veteran. While a scholarship or loans can reduce negative labor market effects by increasing human capital (Angrist & Chen, 2011), incentives associated to veteran compensation programs can reduce labor participation (Angrist *et al.* 2010;Autor *et al.* 2011; Siminski 2013), for example.

[5]Angrist *et al.* (2011) find earning losses for a sample of white Vietnam-era conscripts in the 1970s and 1980s. By the early 90s, it is not possible to observe a "conscription penalty." They also reproduce earlier draft lottery

of voluntary military service, Angrist (1998) shows an increase in the probability of employment (positive earnings) in the years after the service, but with modest long-run gain earnings for nonwhites and a reduction among white veterans.[6] Also the evidence outside of the US points to a heteregeneous effect across countries, population and outcomes. On the negative side, Imbens & van der Klaauw (1995), Siminski (2013), and Bingley *et al.* (2020) report a negative effect on selected labor outcomes for the Netherlands, Australia and Denmark, respectively. [7] Grenet *et al.* (2011) and Bauer *et al.* (2012), nevertheless, using a RD-design do not find a significant effect of the re-establishment of conscription after WWII on earnings in Britain and Germany, respectively.[8] Finally, Card & Cardoso (2012) using matched employee-employer data for Portugal,[9] estimate an insignificant impact on wages for men with higher education, but a positive significant one for individuals with only primary education (4 to 5 percentage points). That is, despite the heterogeneity in the estimates of the cost of military service in the labor market, a significantly greater penalty has been reported among individuals with higher human capital/ability (Bingley *et al.*, 2020).[10] However, for individuals with lower human capital/ability, the cost is lower or in some situations a positive effect is observed (Angrist, 1998; Card & Cardoso, 2012).

Partially responsible for this heterogeneity in labor market outcomes, we expect that military

estimates, with no effect on disability rates. Moreover, Angrist *et al.* (2011) also show no effect on employment probability over the complete period under analysis.

[6]Two identification strategies are used in the analysis. The first one is by restricting the analysis to a sample of applicants to the armed forces, where the source of variation comes from the actual enlisting rate of the candidates. A second strategy used an IV approach with an unintentional change in a screening test score scale as the instrument in the analysis.

[7]Imbens & van der Klaauw (1995) report that those cohorts with a higher fraction of conscripts faced approximately a 5 percent reduction in earnings ten years after conscription. Siminski (2013) reveals that military service is associated with a large reduction of 37 percentage points in the probability of employment for Australian Vietnam veterans in their 50's. Specifically for this last study, the timing of this effect and the mirroring movement in disability pensions rolls, suggest the incentives introduced by a compensation program as one of the potential channels.

[8]Bauer *et al.* (2012) for Germany, find neither a significant impact on wages or employment.

[9]The sample is composed of Portuguese men born in 1967 with work history that goes prior to conscription (age 21). Specifically, information prior to conscription is used to control for ability differences between conscripts and non-conscripts.

[10]Bingley *et al.* (2020) show for Denmark that military service is associated with a negative effect on earnings, which is driven by individuals with higher ability. Specifically, the measure of ability comes from the Armed Forces Qualification Test (AFQT), taken before a lottery that is used as a source of randomization. The authors find a significant reduction in earnings among individuals with higher AFQT and an insignificant effect for those individuals at the lower part of the distribution of ability. Specifically, they find that individuals at the top quartile of the ability distribution face a 7 percent reduction in earnings. Moreover, a reduction in years of education as well as a delay in education are suggested as potential channels explaining at least in part these results in earnings among higher ability individuals.

service would also alter labor market outcomes indirectly through changes in human capital accumulation. Specifically, an ambiguous effect on education is expected. First, for some individuals, military service means acquiring some skills that are valuable in the labor market (Card & Cardoso, 2012) which might enable a substitution out of formal education or in other cases for some individuals, military service can interfere with formal education (Cipollone & Rosolia, 2007).[11] Secondly, for other individuals, acquiring more education means delaying military obligations with consequent benefits that in some cases could mean a reduction in time of conscription, less demanding tasks or even completely avoiding conscription duties (Card & Lemieux, 2001[12]; Maurin & Xenogiani, 2007[13]; Bauer *et al.* (2014)[14]; Torun & Tumen, 2016[15]). Finally, military service enables some credit constrained individuals to access government loans to fund college education (Bound & Turner, 2002; Simon *et al.*, 2010; Angrist & Chen, 2011[16]; Barr, 2014; Barr, 2016) with a consequent increase in educational levels.

Military service might also affect other margins of human capital beyond education and in this way, have a later effect on the labor market. First, military service can affect the health of individuals directly (Hearts *et al.*, 1986)[17] or indirectly by increasing riskier health behaviors (Bedard &

[11] Cipollone & Rosolia (2007) studying social spillovers in education, provide evidence for Italy that men exempted from military obligations were more likely to graduate from high school. Two channels are proposed by the authors. First, since an important fraction of individuals are behind in their schooling, military service led many to interrupt their education. Second, military service reduces the number of years over which they can amortize their investment.

[12] Card & Lemieux (2001) comparing educational attainments of men with respect to women, find a positive effect associated to the risk of induction, consistent with draft-avoidance behavior.

[13] Maurin & Xenogiani (2007) find for France that the end of conscription, the year 1997, is associated with a reduction in high school graduation, years of education and the fraction of young individuals studying. They also show that affected cohorts have lower entry wages. Moreover, these effects are stronger among people with a low socio economic background.

[14] Bauer *et al.* (2014) for Germany, show that individuals affected by the return of military service after WWII were more likely to obtain a university degree in comparison to those individuals who were not exposed to compulsory duties.

[15] Torun & Tumen (2016) find for Turkey that a paid exemption to avoid compulsory military service is associated with a reduction in years of education among individuals who could profit from this benefit. Consistent with the reduction in years of education, a drop in the probability of getting college education and labor income is also reported.

[16] Angrist & Chen (2011) find marked gains in schooling for Vietnam veterans. These gains are attributed to the use of the GI Bill rather than military service avoidance behavior. Despite this gain in human capital accumulation, they do not observe an earnings differential in favor of Vietnam veterans. The authors explain these results as a consequence of the flattening profile of earnings over working life and the low schooling return associated to the GI Bill.

[17] Hearts *et al.* 1986 report that Vietnam veterans have larger mortality rates immediately after Vietnam where this increase in mortality is concentrated in suicide and motor-vehicle accidents. However, Siminski & Ville (2011) and Dobkin & Shabani (2009), studying the impact of the Vietnam-Era military service on different health outcomes for Australia and the US respectively, do not find a significant effect. Siminski & Ville (2011) concentrate on mortality

Deschenes, 2006).[18] Second, for individuals probably at risk of marginalization, compulsory conscription might "*incapacitate*" or "*induce*" them to follow a criminal path (Galiani *et al.*, 2011[19]; Hjalmarsson & Lindquist, 2016[20]). Finally, consistent with the negative effect on the labor market and on human capital, evidence for the US reveals that among lower skilled Vietnam veterans larger federal income transfers and higher disability rates are observed (Angrist *et al.*, 2010). However, this pattern among Vietnam veterans is not only explained by worse health but also by the incentives themselves associated to the veterans disability compensation program (Angrist *et al.*, 2010; Autor *et al.*, 2011).

This paper expands on the literature about the impact of military service on several dimensions. First, I use a source of quasi-experimental variation in military service that has not been used before. Specifically, a randomization coming from a national lottery used over five years (1987-1991) to allocate individuals out of the military service (in the case where there was a surplus of conscripts), and the destination of service that is, the armed forces branch and whether or not they had to serve in their provinces of residence, is exploited. In fact, although the use of lotteries to estimate the impact of wartime military service is common, fewer studies are found with this source of variation when evaluating peacetime military service (Bingley *et al.*, 2020). Secondly, I

rates while Dobkin & Shabani (2009) use several outcomes related to risk factors (tobacco and alcohol consumption), self-reported health, activity limitations and heart conditions among others. The authors of these two studies are cautious about the interpretation of these findings. First, the estimates are highly imprecise. Second, a finding of no effect on health outcomes might reflect the success of compensation programs. Finally, the results on mortality come from a survival sample of veterans several years after the draft.

[18]These authors, for WWII and Korean War veterans, not only find an increase in mortality 20 to 50 years after service, but they explain this increase through the channel of an increase in smoking among veterans.

[19]Using the randomization of men to conscription in Argentina, Galiani *et al.* 2011 find a positive effect on the probability of observing a criminal record. Specifically, they find that results are driven by crimes against property and white collar crimes. The authors use a sample of men born between 1958 and 1962. Since two of these cohorts had to participate during the Malvinas war in 1982, the authors can study differences between peacetime and wartime military service. Although a larger effect is found for wartime service, the authors can also identify a significant effect among those individuals serving in peacetime.

[20]Hjalmarsson & Lindquist (2016), using Swedish administrative data, also find a positive impact of military service on a criminal career (convictions). The authors use the randomization of getting tough draft officers as an instrumental variable for military service. Specifically, they find that those individuals undergoing military service are more likely to be convicted of a crime between the ages of 23 and 30 (post-service). Moreover, they show that these results are driven by individuals with criminal backgrounds prior to conscription, and those with parents with lower levels of education. They find that military service is also associated with lower labor earnings, a higher participation in welfare and an increase in claims for unemployment benefits. For some of the specifications, a positive effect on earnings is found for individuals without criminal records prior to conscription or those with parents with higher levels of education. Finally, for all groups, it is found that military service reduces sick leaves and claims for disability benefits.

build a monthly panel that extends over twenty years of the working life for affected cohorts, which allows us to distinguish short and long run potential effects. Also, several labor outcomes beyond earnings are analyzed simultaneously which enable us to study the impact on other dimensions suggested by policymakers. Thirdly, I study the heterogeneity of the impact of military service on two dimensions. First, I do so by educational levels, since the effect of military service is a function of the opportunity cost which differs by the level of human capital of the individuals. Second, I do so according to the place of service, specifically whether or not conscripts had to fulfill service in their province of birth, and whether or not the effect differs across the branch of the armed forces. Finally, I provide evidence for Spain, a country for which we do not have previous evidence.

The results reveal, first, that the lottery associated to the allocation of the surplus of conscripts effectively shifted the probability that some individuals would go through military service. Specifically, individuals with a birthday spared from military duties through the lottery, were 4 to 6 percentage points (pp) less likely to go into military service. Secondly, the results reveal that differently from OLS or Fixed Effects estimates of the impact of conscription, an allocation out of service through the lottery is associated with significant benefits in the labor market. Specifically, being spared from service increases the probability of being in the labor market (1.6pp), the likelihood of being employed (1.7pp), tenure in the last job (0.15 years) and monthly earnings (1.9pp). Thirdly, the impact is not restricted to the years of active service, however, for extensive margins like employment or labor force participation, it wears off over the years. The impact on earnings measures, on the other hand, is present over the complete period under analysis. We also observe that the impact on unemployment is non monotonic and this fact is responsible for missing an influence of military service when looking as a whole at the period under analysis. Fourthly, I present evidence that avoiding military service through the lottery is associated to an increase in labor market experience (0.2 years) and the likelihood of holding a professional or technical degree (2.8pp). The analysis by level of education reveals that the impact on extensive margins is larger for less educated individuals and can be explained by the loss of market experience. The effect on earnings, however, is larger for the group of individuals with higher levels of education and cannot be explained by this loss of experience. Finally, we observe that the impact on earnings is larger

for individuals who serve in the Air Force or Navy. In fact, among these individuals, it is observed that military service is associated with an increase in the likelihood of suffering from some degree of disability.

The paper is organized as follows. Section 2 briefly sketches the military service system in Spain during the period under analysis, specifically, the source of variation in the treatment under analysis. In Section 3, I describe the empirical strategy and in Section 4, the data and the selected outcomes in the analysis. In Section 5 , I present the results, and Section 6 concludes.

2 Mandatory military conscription in Spain

Military conscription was abolished in Spain in 2001, putting an end to 230 years of obligatory military service.[21] In this paper, I focus attention on the conscription period 1988-1992. During these years under analysis, the military service process used to start with individuals, approximately two years before conscription, registering in their respective town halls.[22] After inscription, provisional lists were constructed based on those individuals who did not postpone the military service or did not claim conscientious objection.[23] Later, on the bases of a medical check-up, a final list was prepared and approximately one year before conscription, the final destination of future conscripts was decided by a lottery. Finally, the year individuals turned 20 or 19 years of age depending on the cohort year (see Table 1), these newly selected conscripts were incorporated into the different branches of the armed forces over different calls.

There are two reasons for choosing this period of conscription, 1988-1992, over others. First,

[21] King Carlos III introduced conscription in approximately 1770, however, it was not until the 1812 constitution that a mandatory military service for the whole (male) population was in place. After the Spanish Civil War, the law governing conscription (Recruitment Law of 1940) established that military service would have a duration of 24 years divided into two years of active service, and 20 years in a role as an army reserve. A reform in 1968 reduced the total duration of the mandatory military service to 18 years (18 months of active service, and 16 as an army reserve). In 1984, the military service was reduced to 12 months of active service and the period as an army reserve was established up to 34 years of age. Finally, in 1991 the period of active service was left at nine months and the period as an army reserve was limited to up to 30 years of age.

[22] After the reform of 1984, the age of conscription was set at 19. Before 1985, the age of conscription was set at 20.

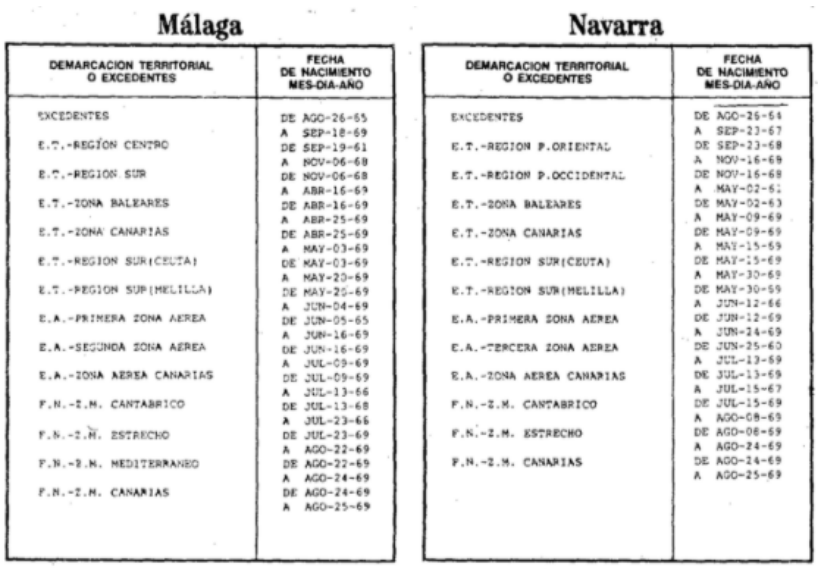
[23] Five conditions were used to defer military service: i) family economic support; ii) studies; iii) another sibling in the army; iv) residing abroad or; v) being elected to a public position by public voting. In a given year, the bulk of deferrals were related to studies. In 1990, for example, from a cohort of approximately 360,000 individuals, 160,000 were temporally excluded. From these temporally excluded individuals, 77% were due to study reasons, and approximately 0.4% claimed conscientious objection.

for this period the previously mentioned lottery was public, so it can be exploited as a quasi-experimental variation in the fraction of individuals doing the military service. In fact, there has always been some randomization in the recruitment process;[24]however, between the years 1987 and 1991, the process was implemented by a *public national* lottery.[25] In early November, with this national lottery held in in Madrid, the potential recruits were allocated to the different bodies of the armed forces, and depending on the year, released from military duties. Specifically, the drawing consisted in selecting one ball out of 366 balls, with a specific date on it. Individuals whose birthdays were just after the selected date (independent of the year of birth) up to a second date that varied across provinces, were allocated first to an army surplus and the remaining individuals were allocated to the different branches of the armed forces.[26] In the case in which a man was allocated to this army surplus, he would be exempt from military duties. A second reason for focusing on the conscription period 1988-1992, is related to the fact that there was an excess supply of individuals available for military services. Two factors can be seen as responsible for this surplus. First, during the 60's and early 70's, Spain experienced its largest fertility rate of the 20^{th} century. Secondly, before 1986, each military conscription cohort corresponded to one year of birth. However, in 1984, a reform shifted the age for the military service from 20 to 19 years of age. The implementation was done over the course of three years, 1986-1988. For each of these years (column 3, in Table 1), each military service cohort consisted in more than one year of birth. In fact, once the transition to the new age for the military service had already been reached (1989),

[24]Even before the introduction of the mandatory military service, under King Felipe V, a kind of a lottery was already in place among part of the population. This lottery aimed to draw a fifth of the men to serve the king. In fact, this target of a fifth of the population gave the name of "quintos" (fifth in Spanish is quinto) to the population of new conscripts.

[25]Prior to 1987, lotteries took place at each recruitment center. First, potential conscripts were sorted by date of birth. Once sorted, individuals were organized into groups of six where each of these groups received a correlative number from one (for the first six individuals in the list) up to N for the last group of potential conscripts. In a public event, one ball out of total of N balls was randomly chosen. The number on the extracted ball defined the individuals who were first allocated to the different bodies of the armed forces and once covering the different military needs, the remaining individuals were allocated as military surplus (excesos de cupos). That is, individuals with a number just below the one selected were those most likely to be excluded from doing the military service.

[26]After the excess of surplus had been allocated, individuals with the following birthdays were consequently allocated to the army, navy and finally to the air force. The final destinations could end up being outside the province of residence. Specifically, Spain is divided into several military regions which have changed over time. For some of the individuals, based on the result of lottery, we can also identify whether or not they had to leave their province of residence. Specifically for those individuals with a province of residence belonging to the chosen military region, it cannot be identified if military service implied a transitory displacement.



Málaga

DEMARCACION TERRITORIAL O EXCEDENTES	FECHA DE NACIMIENTO MES-DIA-AÑO
EXCEDENTES	DE AGO-26-65 A SEP-18-69
E.T.-REGION CENTRO	DE SEP-19-61 A NOV-06-68
E.T.-REGION SUR	DE NOV-06-68 A ABR-16-69
E.T.-ZONA BALEARES	DE ABR-16-69 A ABR-25-69
E.T.-ZONA CANARIAS	DE ABR-25-69 A MAY-03-69
E.T.-REGION SUR(CEUTA)	DE MAY-03-69 A MAY-20-69
E.T.-REGION SUR(MELILLA)	DE MAY-20-69 A JUN-04-69
E.A.-PRIMERA ZONA AEREA	DE JUN-05-65 A JUN-16-69
E.A.-SEGUNDA ZONA AEREA	DE JUN-16-69 A JUL-09-69
E.A.-ZONA AEREA CANARIAS	DE JUL-09-69 A JUL-13-66
F.N.-Z.M. CANTABRICO	DE JUL-13-68 A JUL-23-66
F.N.-Z.M. ESTRECHO	DE JUL-23-69 A AGO-22-69
F.N.-Z.M. MEDITERRANEO	DE AGO-22-69 A AGO-24-69
F.N.-Z.M. CANARIAS	DE AGO-24-69 A AGO-25-69

Navarra

DEMARCACION TERRITORIAL O EXCEDENTES	FECHA DE NACIMIENTO MES-DIA-AÑO
EXCEDENTES	DE AGO-26-64 A SEP-23-67
E.T.-REGION P.ORIENTAL	DE SEP-23-68 A NOV-16-69
E.T.-REGION P.OCCIDENTAL	DE NOV-16-68 A MAY-02-61
E.T.-ZONA BALEARES	DE MAY-02-63 A MAY-09-69
E.T.-ZONA CANARIAS	DE MAY-09-69 A MAY-15-69
E.T.-REGION SUR(CEUTA)	DE MAY-15-69 A MAY-30-69
E.T.-REGION SUR(MELILLA)	DE MAY-30-59 A JUN-12-66
E.A.-PRIMERA ZONA AEREA	DE JUN-12-69 A JUN-24-69
E.A.-TERCERA ZONA AEREA	DE JUN-25-60 A JUL-13-69
E.A.-ZONA AEREA CANARIAS	DE JUL-13-69 A JUL-15-67
F.N.-Z.M. CANTABRICO	DE JUL-15-69 A AGO-08-69
F.N.-Z.M. ESTRECHO	DE AGO-08-69 A AGO-24-69
F.N.-Z.M. CANARIAS	DE AGO-24-69 A AGO-25-69

Figure 1: Lottery cohort 1988. ABC newspaper

until 1992, there was no surplus to be allocated. Specifically, while the national lottery was in place, only individuals from the military cohort for the year 1988 (that is, those born in 1969 or earlier) were exposed to a lower chance of taking part in the military service. Figure 1 presents an extract from the *ABC* newspaper with the lottery's result for two of the 51 provinces in the year 1987 (cohort 1988). For this specific cohort, the randomly selected date was the 26th of August. That is, all the individuals born between this date and the 18th of September in Malaga (as is shown in the figure), or the 23rd of September for individuals in Navarra, were given the choice to avoid military service. In other words, individuals born in August or September for the military service cohort of the year 1988, had a lower probability to be drafted into service, specifically those born in September in provinces with a wider window (as in the case of Navarra relative to Malaga in the example). [27]

[27] Specifically, since we observe the province, month and year of birth, we are able to compute a predicted probability of being drafted into the military service. This probability, in particular, is one for individuals who belong to military service other than 1988, or in the case of belonging to the military cohort of the year 1988, they were not born in August or September. For individuals born in September or August and belonging to the 1988 military service cohort, the predicted probability is obtained assuming uniform distribution of births within the calendar month. That is, it corresponds to the number of days that did not fall into the window that defines the military surplus in a given province over the total number of days in the month. For example, individuals born in September in Navarra had a predicted probability of 7/30 to be drafted into military service, while this probability was 12/30 for someone in Malaga. In a previous version, I used this probability as source of variation. In this version to simplify the exposition, I use as source of variation being born in the month(s) that was (were) associated to allocation into the military surplus.

3 Empirical strategy

The main specification under analysis is the following,

$$y_{imt} = \alpha_b + \alpha_p + \alpha_m + \alpha_t + X_{it}\gamma + \beta * winner_{tbmp} + \varepsilon_{it} \quad (1)$$

with y_{imt} as one of the outcomes for an individual i, at calendar month m, and calendar year t; α_b, α_p, α_m, and α_t are fixed effects by month and province of birth, and calendar month and year, respectively; X_{it} represents other time varying individual factors.[28] Finally, $winner_{tbmp}$ is a variable taking a value, for the periods after the lottery, equal to one in the case where the month of birth corresponds to the one(s) selected by mean of the lottery as military surplus months (when there was one),[29] and zero otherwise. In this specification β, the parameter of interest, corresponds to the difference in the change of a selected outcome between individuals being born in the months associated to the military surplus and the rest of the individuals, between ages (periods) before and after the lottery. That is, β has an interpretation similar to the one in a Dif-in-Dif.[30] Specifically, in this current analysis the treatment status varies across time, and date of birth for one of the cohorts. However, differently from a Dif-in-Dif approach, the treatment/control status is randomly assigned by a national lottery based on the date of birth. However, a potential problem with the

[28]Specifically, in the preferred specification, I include age fixed effects and a dummy variable that takes a value of one in the case in which a worker reached at most elementary education, and zero otherwise. Also, in some of the robustness checks I include as well a cubic polynomial in labor experience measured in months. I opt for controlling for education through a dummy variable that indicates reaching at most elementary education, since this is a level of education that should have been reached prior to the lottery. That is, it can be considered as predetermined.

[29]Specifically, individuals born in August and September in the military cohort of the year 1988 are those who after November of the year 1987 are defined as winners (see Table 1). Moreover, since the threshold date in September differs across provinces, the predictive probability of winning the lottery, which is not more than the fraction of days in the month reserved to the military surplus should also vary across provinces. See footnote 27 for more details.

[30]Recent literature on two-way fixed effects and its link with traditional Difference-in-Difference estimator has brought to the light several issues in the estimation and interpretation of the parameter of interest (Callaway & Sant'Anna, 2019). In a general context with different periods and difference in the timing of the treatment, the estimated parameter rather than an Average Treatment on the Treated (ATT) at the center in the traditional Difference-in-Difference setting, can be expressed as a weighted average of different ATT (Wooldridge, 2005), with these weights potentially taking negative values (Goodman-Bacon, 2018). At the center of these issues, is the heterogeneity in the treatment and several groups being treated at different periods. These concerns do not apply in the current analysis. The treatment, being spared from military service through the lottery affected just one of the cohorts at one period. That is, our setting is closer to the text book Difference-in-Difference setting where the allocation of the treatment/control group is randomly defined by the lottery.

use of the date of birth as the allocation variable is its potential cofundeness with other unobserved factors. Buckles & Hungerman (2013) show for the United States, for example, that date of birth is correlated with mother's characteristics.[31] Nevertheless, since the lottery date changed over the years (and cohorts), and there was not a surplus every year , the contribution of these unobserved factors that are associated to the date of birth or the province, should be identified out of the contribution of the lottery and absorbed by the different fixed effects, α_s. The critical assumption in the analysis is that the change in the variable $winner_{tbmp}$, between the periods before and after the national lottery, does not capture the contribution of any other factor between these periods/ages. Despite the fact that this assumption cannot be tested, the randomization implicit in the lottery and the fact that we observe some individuals before its implementation, makes it easy to believe that it holds, first, and verifies that winners and no winners do not differ in observables characteristics prior to the lottery.

The previous specification can be seen as the reduced form in a model where the parameter of interest is the one associated to military service and the variable $winner_{tbmp}$ is its instrument. Specifically for a given outcome, I can estimate as well the following specification,

$$y_{it} = \alpha_b + \alpha_p + \alpha_m + \alpha_t + X_{it}\gamma + \omega * mservice_{it} + u_{it}, \quad (2)$$

where $mservice_{it}$ is a dummy variable that takes a value of one for all the months after an individual was identified as doing the military service, and zero otherwise. That is, the impact of military service, ω, is identified using the variation from the change in the probability of being drafted the year when there was a surplus, for those individuals who saw their chance of doing the military service reduced, which differs across birthdays. For all the specifications, we cluster the standard errors at the cell level defined by the date (year-moth) and province of birth.

[31] Specifically, they show that children born in winter are more likely to be born to a mother with lower levels of education. These mothers are also more likely to have been teen moms, and they are more likely to be Afro-American.

4 Data and Variables

The data used in this study comes from the Continuous Sample of Work Histories (CSWH) (*Muestra Continua de Vidas Laborales* - MCVL) for the period 2007-2012. The CSWH is obtained by matching several administrative registers from Social Security files, the Continuous Registry of Municipal Inhabitants, and Tax Agency records. The sample is composed of individuals, selected randomly, among all people who had some relation with the Social Security system at some point in time during the reference year (individuals who are working, receiving unemployment benefits or receiving a pension), previous to the one in which the data set is released.[32] The sample size is 4% of the universe, resulting in more than a million individuals for each year. In every release, the longitudinal structure of the sample is preserved, where less than 10% of individuals are lost or incorporated every year. For each individual in the sample, information about labor market activity goes as far back in time as Social Security records permit --since the date of first employment, or since 1980 for earlier entrants.[33] The database is constructed in such a way that workers can be tracked down through all their past employment relations registered with Social Security. Dates about the start and end of each employment contract are recorded. Using this information, I construct a monthly panel tracking the working life of each of the individuals in the sample. At every given point, we know the individual's working status and, in the case of working, the type of contract, occupation, and earnings from Social Security records.[34] Also, by using the longitudinal dimension and the fact that we can identify a worker's firm over time, we construct tenure, and labor experience. Demographic characteristics such as gender, age, education, place of birth and household composition are also available for the year of extraction.

To infer military service status, I proceed in a fashion similar to Card & Cardoso (2012). As in their case, I do not have military records that can be combined with labor market data for the

[32]Individuals registered with Social Security in order to get health benefits, those receiving welfare assistance and job seekers who do not receive benefits, are not included in the universe. Finally, civil servants of the General Administration of the State are also excluded from the reference population.

[33]The oldest cohort in the sample is composed of individuals who were born the year 1968. That is, they were approximately 16 years old in 1984. So it is reasonable to think that we have the complete working life for the sample of individuals included in the analysis.

[34]Around 10% of the Social Security earnings are top or bottom coded. Gross labor earnings from tax records, also available in the MCVL, are not subject to censoring but they are only available from the year 2004.

complete population. Instead, I use the fact that individuals' records from Social Security report "military service" among the reasons for a job separation.[35] To implement this definition, I first focus attention on the CSWH for the period 2007-2012 when "military service" was distinguished individually from other reasons as a cause for a job separation.[36] Second, I limit my attention to individuals who were exposed to the national lottery that enabled some of these individuals to be exempted from conscription. Given these, we focus on individuals born between 1968 and 1973.

Using the CSWH, I define two groups of variables. The first one is formed by seven variables characterizing the labor attachment of an individual. First, the variable "Out of SS records," corresponds to a dummy variable that takes a value of one in the case in which an individual does not have a Social Security (SS) record in a given period, and zero otherwise. The variables "Employed" and "Unemployed" are two dummy variables that indicate whether or not an individual is employed or using unemployed insurance, respectively. The following variable, "Self-employed" is a dummy variable that takes a value of one in the case in which an individual is self-employed, and zero otherwise. The fifth variable,"Tenure," corresponds to the duration with the current employer in the case of being employed, or with the last employer in the case of being unemployed or out of the labor force (without SS records). The last two variables in this group aim to capture the impact of the mandatory military service on other dimensions that several times are suggested as additional benefits/cost of conscription. First, the transfer of common values that might enable integration and help with social cohesion is often associated to military service. Also anecdotal evidence highlights the fact that military service was the time of life when a young man would be exposed to people from different regions and economic backgrounds. With this in mind, I construct a variable that indicates the migration status of individuals, "Migrated from province," taking a value of one in the case where an individual works in a province different from the province of birth.[37] Also, previous research has linked military service to worse health outcomes. So, to

[35]Art. 45 of "*Estatuto de los Trabajadores*" established the right that the worker's position had to be held while he was doing military service.

[36]From the year 2013 onward, military service as reason for job separation started to be grouped with reasons related to legal strikes, change in contract and a firm's closure.

[37]In a previous version, I also constructed a variable indicating whether or not the individual works in an autonomous community different from the one of birth and similar results were obtained. Spain is organized into 17 autonoumous communities. This political and administrative division was created with the Spanish constitution of 1978. Despite the fact that Spain is not a federal state, these communities as the name reflects, enjoy considerable

evaluate a potential health impact, I construct a dummy variable that indicates whether or not a worker suffers from any disability.[38]

The second group of variables is composed of four variables related with earnings. The first one is a dummy variable that indicates whether or not positive earnings are observed in a given month and zero, otherwise. The second variable, "Monthly Gross Income", as its name reflects, corresponds to the log of gross income for all the individuals under analysis. While this variable is closer to a concept of earnings for employees, for self-employers this measure can be influenced by the worker or reflects institutional restrictions. For this reason, I constructed two additional measures of income. First, we construct/restrict earnings to just employees in a given period. However, since the decision of becoming self-employed can be influenced by military service, the previous measure would suffer from a selection problem. In order to overcome this problem, a fourth variable on earnings includes all workers and for those working as self-employers or not employed, I input as earnings the last ones observed as employees.

The descriptive statistics for the main variables under analysis are reported in the first column of Table 2. The first element to be noticed is that approximately 14% of the individuals report a job separation motivated by military service. This magnitude is a lower bound of the incidence of military service in the whole population since I only observe military service among individuals with a job prior to the lottery.[39] Considering that every year approximately 200,000 up to 250,000 individuals were drawn into the army, the risk of military service in the population was approximately 50% over the period under analysis (with respect to the birth cohorts affected). That is, our measure of military service underestimates the fraction going into military service: an additional reason to address the endogeneity in military service.

In terms of labor market outcomes, the average monthly earnings (in euros of 2009) is approximately 800 euros, 70% of the individuals are employed over the period under analysis, with

autonomy in several dimensions such as culture-education, spending, welfare and social policy, etc. Each autonomous community is organized into one or several provinces.

[38]Specifically, I use the degree of disability reported by the employer and the causes for job separation to define whether or not an individual presents any degree of disability. Specifically, among the reasons for job separation that I use to define permanent or temporary disability, are the transition to job retirement, and reporting separation due to temporary disability.

[39]For individuals born between the years 1968 and 1973, the median age at which they are observed for the first time in Social Security records is approximately 19 years of age.

approximately 15% of the individuals working as self-employed.[40] The rest of the variables reveal that approximately 44% of the individuals have resided in a province different from the one of birth, and around 3% of the individuals are defined as suffering from some level of disability. In terms of human capital, almost approximately 30% of individuals have basic education as the highest education level and only 42% of the individuals have completed high school or have some post secondary education. Column (2), for the sample of individuals with Social Security records a year before the lottery and part of the labor force a month previous to this event, reports the same statistics for those individuals who did not "win" the lottery at the age of 17 and Column (3), the average difference between those who eventually won the lottery and those who did not before the lottery (at age 17).[41] From Column (3), we observe that lottery winners earned approximately 80€ less per month, and were more likely to live in a place different than their province of birth. From Table 1 we can observe that for early cohorts, the selected dates concentrate earlier in the year with respect to the last two years when the national lottery was in place, that is, early lottery winners were older compared to those born in the same year compared to those in later years. Columns (4) and (5) report the differences conditional on age and year for all the cohorts and the cohort of 1988 (for the only one where there was a surplus), respectively.[42] We can see now for these conditional differences that, consistent with the randomization of the lottery, there are not differences prior to the lottery between those seeing their probability of conscription reduced and the rest.

[40]Despite the fact that for every period just 15% of the individuals are observed as self-employed, over the complete period under analysis, 50% of the individuals are observed at some point as self-employed.

[41]These statistics are only reported for variables for which I have information prior to the lottery. As I already mentioned the information about education corresponds to the one reported in the municipal registry, which is not the level of education prior to the lottery.

[42]I also control for a dummy variable taking the value of one in the case in which the individual has reached at most elementary education, and zero otherwise. The results are not sensitive to the inclusion of this variable, but I include it in order to maintain consistency with the preferred specification.

5 Results

5.1 Impact of the lottery on military service

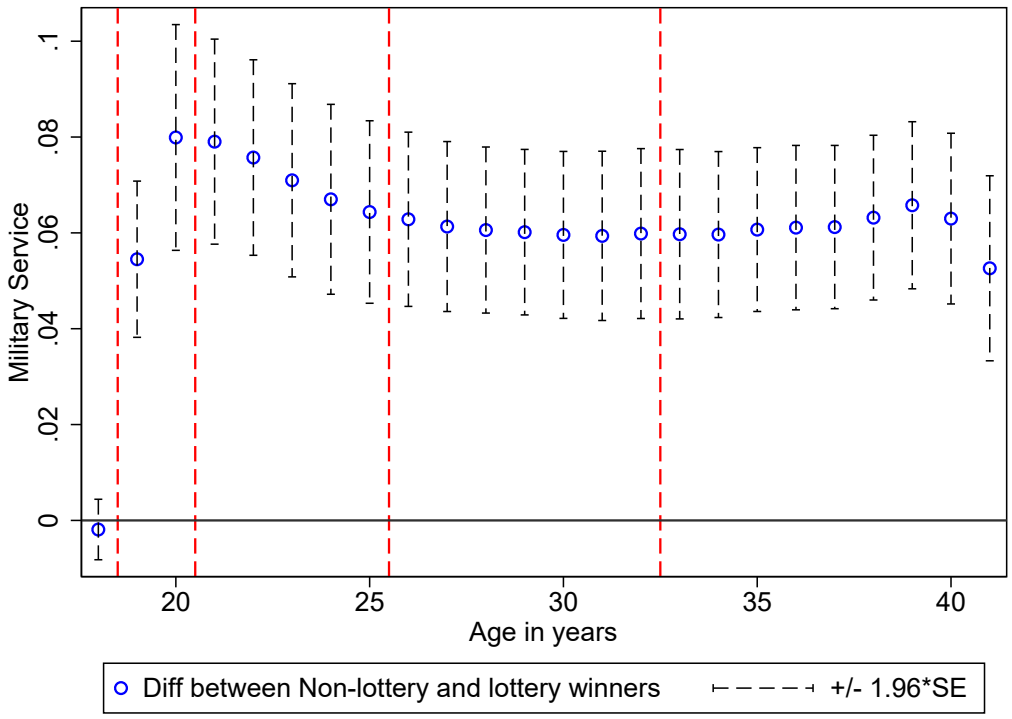
Despite having an individual monthly panel and information about military service, a valid concern is that transition into military service is observed only for a selected sample of individuals who had a job at the time of military conscription.[43] In order to address this potential selection, I combine the existence of a surplus and a national lottery used to allocate this surplus as a source of variation in military service. Specifically, the source of variation used comes from the difference in the probability of being drawn into the military service between individuals whose probability of serving in the armed forces was not reduced with the lottery, and those who did (with their birthdays just after the date selected by the lottery). Figure 2 presents graphically the source of variation used. Each of the panels depicts the difference in the fraction of individuals reporting a job separation due to military service between those individuals who did not see their risk of conscription reduced and those more likely to profit from the lottery at each age. Panel A, reports the unconditional differences, while Panel B shows these differences after all available controls were included.[44] The two first vertical dashed lines indicate the ages affected by the military service.[45] Notice that the timing is consistent with the call-up at the age of 19. Second, previous to the lottery, we do not observe differences in job separation due to military service between the two groups of individuals either in the conditional or in the unconditional specification. Finally, between the ages of 19 and 20, a sizable difference in the risk of separation due to military service appears and remains stable over the 20 years that we follow these five cohorts. Specifically, a significant 5 to 7 percentage point difference in the risk of military conscription is observed.

Table 3 presents formally the estimated impact of being born in the months associated to winning the lottery on the variable of military service. Panel A presents the estimates using all the

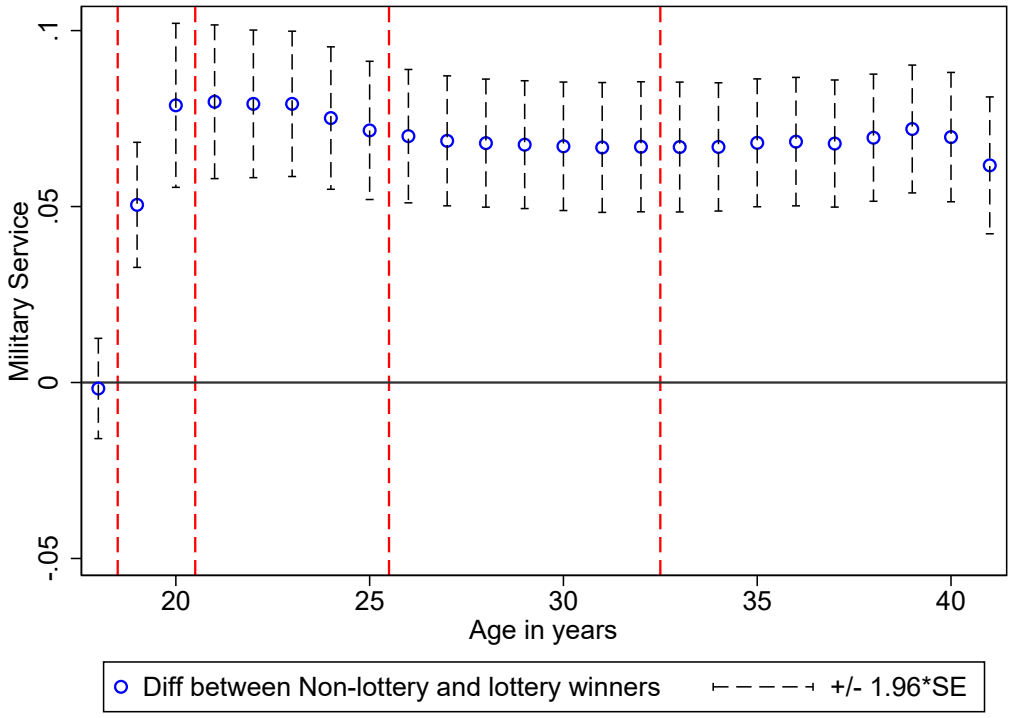
[43] For the sample of individuals continuing with tertiary education, the transition into military service is not only unobserved but also as shown by previous research (Card & Lemieux, 2001; Cipollone & Rosolia, 2007; Maurin & Xenogiani, 2007; Bauer *et al.*, 2014; Torun & Tumen, 2016), can be affected by military service. In 1990, in Spain, approximately 120,000 individuals postponed military service due to study reasons.

[44] Other controls are a dummy variable indicating at most elementary education,calendar year, calendar month, month of birth, and province fixed effects.

[45] The lottery used to take place during the second week of November. While the majority of the individuals had already turned 18 years old, those with a birthday after the lottery were still 17 at the time of the lottery.



(a) Unconditional differences



(b) Conditional differences

Figure 2: Difference in the probability of conscription between individuals according to the status of not winning the lottery and those winning it.

cohorts affected by the national lottery. Panel B shows just the military cohort of the year 1988 when there was a surplus of conscripts. Finally, Panel C presents the estimates of being born in the month selected by the lottery the years when there was not a surplus. Each column presents different specifications with the control variables reported at the bottom of the table. The first element to be noticed is the fact that for the years when there was not a surplus, being born in the months selected through the lottery does not affect the probability of going into the military service.[46] Second, the magnitude of the estimate is quite stable across the two samples (Panel A versus Panel B), and robust to the controls used (across columns). This stability is not only consistent but confirms the randomization behind the reduction of the probability that someone be drafted. Specifically, the estimates suggest that being born in the months allocated to the surplus, reduces the probability of doing the military service by approximately 4.5 to 7 percentage points. In terms of the sample mean, these estimates suggest a reduction of approximately 35%. Part of this low observed compliance is explained by the fact that the transition to military service is being observed just for those individuals working prior to the military service. Table 4, following a structure similar to the previous table, presents the estimates for the sample of individuals with records in the Social Security one year prior to the lottery. The estimate of the impact of winning the lottery doubles, suggesting perfect compliance with respect to the sample mean.

Table 5 presents the estimates by educational level. Ideally, we would like to observe the educational level reached prior to the lottery. Nevertheless, the educational level available in the MCVL is the one coming from the household registry the year when the individual is drawn into the survey. In order to circumvent this issue, I define two educational levels: whether or not a worker has elementary education[47] or less and; whether or not an individual has more than this level. This educational level should have been reached prior to the age of 18 when the lottery took place. The results by these two educational levels not only confirm a relevant variation across educational groups, but these point estimates also suggest a larger compliance among individuals with lower

[46] For the years without the surplus, the lottery just defined the branch of the armed forces where they had to serve and the region where they had to do the military service. For that reason, this last specification also includes two dummy variables that indicate whether or not the birth month is associated to infantry service and whether or not the military service was outside the province of birth.

[47] Educación General Básica (EGB) in Spanish.

levels of education. While the estimates associated to winning the lottery for the individuals with more than elementary education suggest a reduction of approximately 5 percentage points, the estimates for individuals with at most elementary education are closer to 10 percentage points. In fact, this larger compliance among the less educated is explained in part by early entry into the labor market among these individuals for whom we are more likely to observe the transition into military service. For individuals who had planned for tertiary education, that is, delaying entry into labor market, we do not observe the transition into military service. While the reduced estimates associated to equation 1 are not affected, we must be careful in the interpretation of the estimates of equation 2 that are driven by compliers with working-life prior to the lottery, who as we see, tend to have lower levels of education.

Finally, note that as in an instrumental variable approach for all samples and specifications, the F-statistic associated to the null hypothesis about the relevance of the excluded instrument is over the usual threshold, which enables us to rule out any concern about a weak correlation between military service and predicted probability of being drafted.

5.2 Labor outcomes

5.2.1 Benchmark impact of the military service on labor outcomes. OLS and Fixed effects estimates

Table 6 presents the benchmark estimates of the impact of military service on several labor outcomes. Specifically, the estimate of the population parameter reported in the table corresponds to the one for the dummy variable that indicates whether or not an individual has taken part in the military service (ω in equation 2). The upper panel presents the OLS estimates with the full set of covariates but without individual fixed effects. The bottom panel presents the individual Fixed Effect (FE) estimates.

In general, the OLS and FE estimates reveal a positive effect of military service. Both estimates, OLS and FE, reveal that military service reduces the likelihood that an individual would be out of the labor force over the period under analysis. The differences between these estimators reside in the magnitude. While OLS estimates reveal a reduction of approximately 8 pp, FE shows a

reduction of approximately 3.5 pp. Under the assumption that these omitted factors contained in an individual fixed effect(such as ability) have a positive contribution in terms of engagement in the labor market (negative effect on the probability of being out of the labor force), this larger magnitude for OLS would suggest a positive selection into the military service. Second, both estimates reveal that military service is associated with a higher engagement in the labor market, which is reflected by not only an increase in the likelihood of being employed, but also by an increase in the use of unemployment insurance. Third, consistent with a positive selection into military service, OLS estimates reveal a smaller effect on gross earnings among all workers and employees, but both OLS and FE show an increase in earnings when I use imputed earnings. Finally, both OLS and FE estimates reveal a positive impact on the likelihood of being self-employed and on job-tenure.

It is important to recall that the FE estimator would provide a consistent estimate of the impact of military service when the contribution of these potentially omitted factors are fully captured by the individual's fixed effect. Moreover, by including person's fixed effects in the estimated model, the variation that is being exploited to learn the impact of military service comes from those individuals for whom the transition from the labor market into the military service is observed. Therefore, individuals with a lower labor-attachment around the time of the military draft are less likely to be observed making this transition. That is, time-variant factors affecting labor attachment are still contained in the observed factors (ϵ_{it}) and they are likely to be correlated with the within variation of our measure of military service. Who are these individuals with a higher labor attachment at the time of conscription for whom the transition into military service is observed? Probably those with higher cost or some liquidity constraint to go on with the their human capital accumulation, or/and a higher opportunity cost of leaving the labor market. This type of selection is probably behind the observed differences between OLS and FE for the rest of the outcomes. Despite the increase in labor attachment, FE estimates still reveal a greater chance of being unemployed (a reduction of 2 pp), and they are more likely to be self employed (an 2.6 pp increase).

In order to address this potential bias presented in a model with individual fixed effects, we

use instead the variation that comes from the random allocation of the surplus of conscripts. As we have already shown in Table 3, the lottery induces a significant change in the likelihood of serving in the military. However, in order for a potential difference observed in labor outcomes between winners of the lottery and the rest of the individuals to be attributed to the impact of military service, we would need this additional source of variation to be uncorrelated with other time variant factors (still contained in the error term). Despite the fact that this assumption is not testable, a correlation with predeterminate variables would raise some concerns about the orthogonality with other unobserved factors. Table 2, columns (3) to (5), presents the sample means differences between lottery and non-lottery winners before the lottery. While column (3) reports the unconditional differences, columns (4) and (5) report the conditional differences for all the cohorts and the ones only for the 1988 cohort, respectively. As already reported, there is not a detectable conditional difference between lottery and non-lottery winners prior to the year of the lottery.

5.2.2 The reduced form impact of allocation into the military surplus on labor outcomes

The evidence in section 5.1 points to a relevant reduction in the probability of going through military service for those individuals with a birthday that makes them more likely to be sent to the military surplus. Then, do these individuals perform differently in the labor market? Before addressing this question, Table 7 inspects the impact of winning the lottery on the usual two channels seen as driving forces behind the impact of military service on the labor outcomes: market experience and education. Panel A presents the estimates of winning the lottery using the (static) specification in equation 1, while Panel B shows a dynamic specification of the impact on market experience.[48] It is important to recall that the information about education is obtained at the time individuals are included in the MCVL, that is, the estimates from a dynamic specification using educational outcomes as dependent variables are not informative about the impact of the lottery over time. Specifically, I construct four outcomes for education. The first one, "Less than Schl.

[48] In the dynamic specification, I replace the variable $winner_{tbmp}$ by four variables whose associated parameter indicates the impact of lottery at different ages. Specifically, each of these variables is the interaction of this dummy variable $winner_{tbmp}$, and a dummy variable that indicates each of the age groups: 19-20, 21-25, 26-32, and more than 32 (33+).

Graduate", is a dummy variable that takes a value of one for individuals with at most mandatory education and zero, otherwise. Second, for individuals with at most a school graduate level of education, the variable "Read & Write" is a dummy variable that takes a value one for individuals who do not have these proficiencies, and zero otherwise. A third variable, "HS or more", is a dummy variable that takes a value of one for individuals who have obtained a minimum of a high school (or equivalent) diploma, and zero otherwise. Finally, "Professional educ.," is a dummy variable that takes a value of one for those individuals reporting technical or professional training, and zero otherwise. The results reveal that individual who avoid military duties by winning the lottery see their labor market experience increased by approximately 0.23 years. Second, the dynamic specification allows us to see that this increase in market experience rather than wearing off, tends to increase over time. While an impact during the years of incapacitation (19 and 20) is not observed, the impact of the lottery is close to a third of a year for individuals older than 33. Third, we do not observe that winning the lottery is associated to differences in levels of education or the probability of reaching basic competence, such as knowing how to read and write. However, we do observe that individuals who were more likely to avoid military service see their probability of holding a professional degree increased by approximately 3 percentage points. That is, while individuals do not see their probability of going on with tertiary education affected , they are more likely to substitute a professional degree for an academic one. There are two potential interrelated reasons behind this substitution. First, general academic studies are longer than professional training, so individuals who perceived some benefits by postponing military duties, were able to do it for more years (up to the age of 25) by following this track.[49] That is, once spared from military duties, they are more likely to return to a preferred track. Finally, since the population of individuals who were surprised by the lottery are the ones who were not able to postpone military service before the lottery, the allocation into the surplus gives them an additional year which is better suited due to the duration of professional training, for a population of individuals who did

[49]Moreover, the application process for postponing military service due to studies is somewhat biased for academic degrees. Despite the fact that professional education can be used to postpone military service, the fact that studying abroad can be used to postpone military service provides additional benefits for academic studies that are the ones opening up this possibility (Ley 19/1984, Artículo 91). That is, individuals might perceive a larger expected benefit in terms of postponing military duties for academic studies.

not necessarily want an academic track in the first place. This substitution of studies might not be harmful by itself. However, in the case in which this degree substitution is associated to an educational mismatch, it might have a permanent effect on the labor market. That is, both the effect of the lottery on labor market experience and on education, together with the evidence in section 5.1 contradict the estimated positive effect from the OLS and Fixed Effect models. In fact, we are observing that those granted avoidance of military service are less likely to do it, and we consistely see them accumulating more market experience and substituting out of academic studies.

Consistent with reported benefits in terms of market experience and professional education, on the other hand, we observe in Tables 8 and 9 a positive association between a larger probability of being allocated to military surplus and extensive margins. Specifically, individuals who were allocated to the surplus are less likely to be out of the labor market, and more likely to be employed. Panel A of Table 8 shows for the complete sample of individuals a 1.6 percentage point reduction in the probability of not observing a Social Security record (7% with respect to the sample mean). Almost of equal magnitude, being spared from military duties is associated with a 1.7 percentage point increase in the probability of being employed (2.36%). Finally, being born in the months associated to the military surplus is associated with an increase in tenure in the last job of approximately 0.15 years. These results added to the negative effect of winning the lottery on the probability of going through military service suggest that military service has a negative effect on labor market outcomes with a reduction in the probability of taking part in the labor market as well as on employment. A second specification in Panel A explores the role of loss of experience as a potential channel in the negative effect of military service on labor outcomes by including a cubic polynomial in market experience.[50] A considerable drop in the impact of winning the lottery on the previous outcomes is observed, but is still significantly different from zero. Panel B in the table presents the analysis when splitting the sample according to the level of education. Despite observing an effect on labor force participation and employment for both samples, the effect is almost double among individuals who reached at most elementary education.

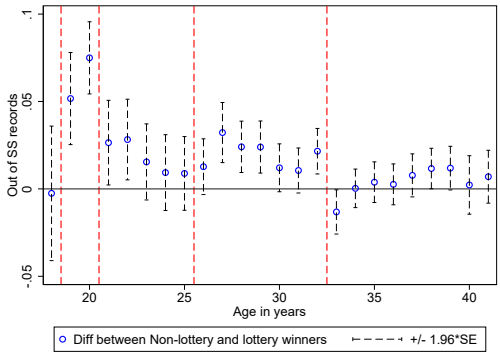
[50]This specification is not the preferred one. In fact, we can expect an inconsistent estimate since I am controlling for experience, which as I have just shown, is affected by the lottery.

We observe a reduction of 2.1 pp in the probability of being outside the labor force, and an increase of 2.4 pp in the probability of employment for less educated individuals. In fact, the evidence that the channel behind the results is the loss of experience is consistent with this larger effect among the less educated individuals. For these individuals who had already completed formal education, military service interferes with their entry in the labor market when the first year of experience had a larger return. I further explore this potential explanation in Panel C and D. In Panel C, I restrict attention to individuals who already had Social Security records a year prior to the lottery, so they had accumulated some experience in the labor market. Specifically, I report the estimates for the complete sample and for the sub-sample of individuals with lower levels of education for whom the labor market experience is the most important source of human capital. Consistent with this hypothesis, the less educated with some experience before the interruption associated to military service is not only present in generally smaller point estimates, but they are all insignificant. At the other extreme, the penalty in terms of experience should be larger in those labor markets with a larger return of experience. For Spain, De La Roca & Puga (2017) report a larger return of experience in bigger cities. Panel D reports the estimates in larger municipalities for the complete sample and the sub-sample of less educated. Again, consistent with the role of experience among the less educated, we observe the largest benefits in terms of labor force participation and employment (3.5pp).

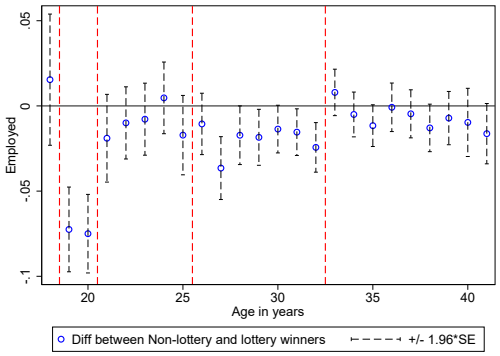
Figure 3 and Table 9 present the dynamic impact of the lottery. Specifically in Figure 3, I check the robustness of the results by analyzing the timing of the changes. A causal interpretation of the previous findings would be weakened if we found that the change in the selected outcomes would reflect a trend prior to the age of conscription. In order to examine these issues, I add a series of leads and lags to equation (1). Vertical lines are introduced as reference: 19, 20, 25, and 33. Consistent with the evidence in Table 2, for none of the outcomes do we observe a difference in the outcomes between those individuals who experience a larger probability of conscription with respect to those that who profit from an allocation to the surplus a year prior to the lottery. Also consistent with the fact that the estimated impact comes from military service duties, Panel E in Table 8 shows for the cohorts that did not face a military surplus, an impact of the lottery

close to zero with the exception for tenure in the last job, which anyway presents the opposite sign. The dynamic specification reported in Table 9 presents the estimates for four age groups:19-20, 21-25, 26-32 and over 33 (33+). First, the positive effect of the lottery (being spared from military duties) in terms of labor outcomes is largest at the ages of 19 and 20. This is something expected since these are the ages associated to active service, that is, the years when military service incapacitates individuals from civil life. Second, although we do observe an effect beyond the years of active service, it wears off over time. In fact, after the age of 33, we do not detect a significant effect on any of the selected outcomes. Third, for some of the outcomes, we observe that the effect of not winning the lottery is not monotonic. Specifically, while at the ages of 19 and 20, we observe that winning the lottery is associated with a decrease in the use of unemployment insurance (1pp), at ages of 21 to 25 the allocation to the military surplus is associated with an increase in this probability (0.7pp). In fact, this non-monotonic impact explains why we might overlook an impact on unemployment when looking at the complete working life of individuals. Fourth, Panel B in Table 9 presents the estimates of this dynamic specification when controlling for experience. As we saw in the static specification (Panel A, Table 8), there is a considerable reduction in the impact of winning the lottery. In fact, the still significant effect is restricted just to the years of active service. That is, the evidence is consistent with the idea that the penalty associated to the military service comes from the loss of experience.

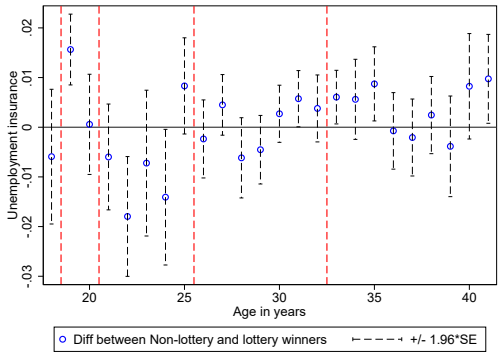
Following the same structure, Tables 10 and 11 present the results for the earnings. Panel A, in Table 10, shows, in line with the impact on extensive margins, that the allocation to the surplus increases the probability of observing positive earnings by approximately 1.7 pp, which as well as the impact on other extensive margins, goes to zero when controlling for experience. Second, we see that being given the chance to avoid military duties is associated with an increase in all earning variables. Specifically, we observe that being allocated to the army surplus increases gross earnings by approximately 2 pp for the complete sample and up to almost 3pp among employees. The dynamic specification in Table 11 shows that, similar to the previous group of outcomes, the larger effect of earnings is observed the years of active service (19-20) with an impact of approximately 4pp. Third, as for the previous group of outcomes, we observe that the impact on



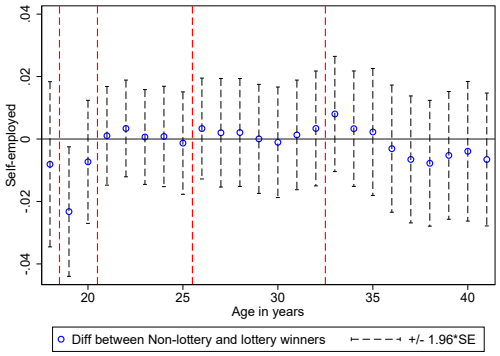
(a) Out of SS records



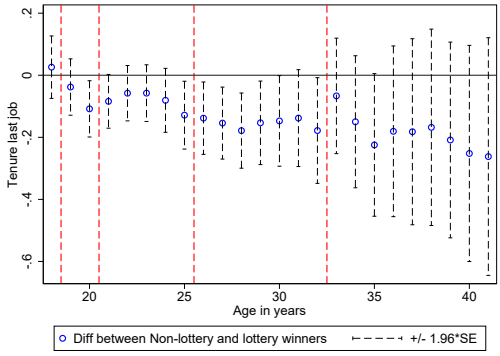
(b) Employed



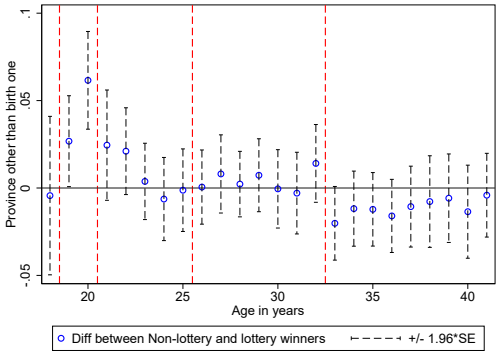
(c) Unemployed



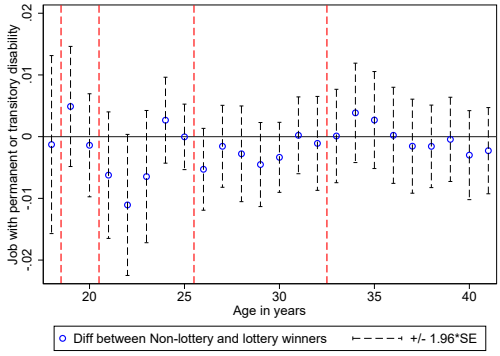
(d) Self-employed



(e) Tenure last job



(f) Migration

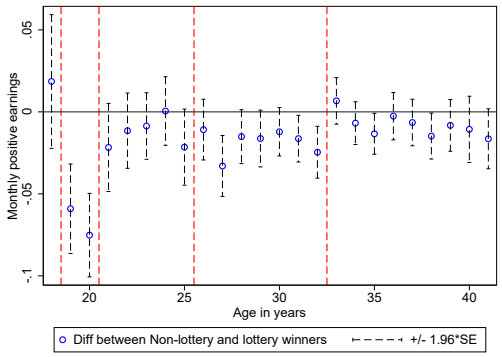


(g) Disability

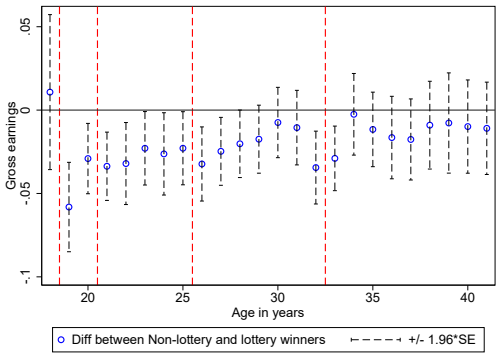
Figure 3: Dynamic effect of winning the lottery on selected labor outcomes

earnings is wearing off over the period under analysis. However, differently from extensive margins, we do observe a significant effect on earnings of employees (2pp) or for the imputed measure of earnings after the age of 33 (4pp). Finally, in line with the idea that the channel is the pass through military service, for the cohorts who did not profit from a military surplus (Panel E), the impact on positive earnings and log of earnings is not only insignificant but the point estimates are considerably smaller than the ones observed for the complete sample (Panel A). Despite the positive effect on earnings, some differences are observed in the impact of winning the lottery with respect to the one observed on extensive margins. First, the impact on earnings seems robust to the control of market experience for both static and dynamic specifications. Second, the analysis by level of education reveals a larger point estimate among individuals with more than elementary education. In fact, among the less educated, the impact on gross earnings for the complete sample and employees is not significantly different from zero. A potential explanation for this difference is that, while an experience channel is more important for less educated workers, for more educated ones (more likely to take part in the labor market independent of military status), the gains from avoiding military service are coming from an educational channel (going for professional education). In fact, when considering individuals living in larger provinces, the effect among the less educated continues to be insignificant (Panel D).

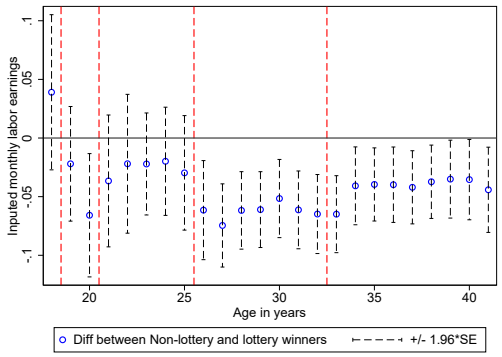
Therefore, the evidence is consistent with individuals who were not exempt from military duties facing a penalty in the labor market beyond the years of active service. First, individuals over the complete period under analysis accumulate fewer years of experience and they are less likely to continue with technical/professional training. Consistent with this positive effect on experience and human capital, being spared from military service has a positive effect on labor force participation, the probability of employment, labor earnings, and job tenure. Finally, while the effect on extensive margins is more important among less educated individuals and can be explained by the gains in labor market experience, the effect on earnings is greater among more educated individuals and cannot fully be explained by experience.



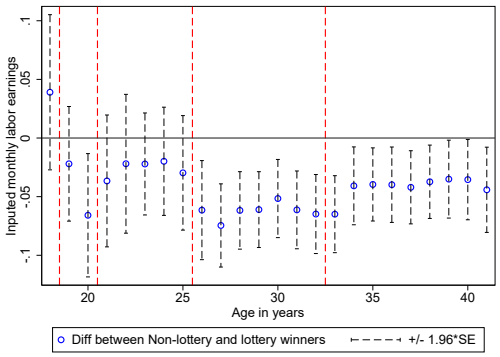
(a) Monthly positive earnings



(b) Gross earnings. All individuals



(c) Employees' earnings



(d) Imputed earnings

Figure 4: Dynamic effect of winning the lottery on non traditional outcomes

5.3 Impact of military service on selected outcomes. 2SLS

Results in Tables 8 to 11 can be seen as the reduced form estimates in a context of an instrumental variable approach with the the lottery status used as the instrument. The MCVL provides us with a proxy for military service, that is, an estimate of this treatment can be calculated. Table 12 presents the 2SLS estimates of ω in equation (2) using lottery status as an instrument for military service. Consistent with the reduced form in previous sections, we observe that military service is associated with approximately 24 pp reduction in the probability of employment in a given month. This reduction, as we saw in the reduced form, is explained by an increase in the probability of being out of the labor market, that is, an increase in the probability of being out of Social Security records. Second, military service is associated with a reduction of approximately two years of tenure in the last observed job. Finally for labor outcomes, military service is associated with an approximately 24pp (33pp) reduction in monthly total earnings (employee's earnings). Differently from OLS or Fixed Effects estimates, in Table 6, 2SLS estimates of the impact of military service reveal a sizable negative effect of military service. However, we must be cautious about the magnitude of these estimates. Recall that 2SLS estimates can be seen as the ratio of the reduced form impact of the lottery on a given outcome over the reduced form for military service (First-Stage). Firstly, as we saw from the reduced form for military service, compliers tend to be individuals with lower levels of education for whom the impact of the lottery on outcomes, larger numerators, is more important on extensive margins. Secondly, for more educated individuals where we observed a bigger impact of winning the lottery on earning outcomes, the estimates of the First-Stage are likely to give us a lower bound of the First-Stage (denominator) since the transition into military service is only observed for those who had a job previous to conscription, that is, more likely to be less educated individuals. In fact, in Panel B when the sample is restricted to individuals with lower levels of education (at most elementary education), the effect on extensive margins is practically unchanged, but the impact on earnings is cut in half and they are not longer statistically significant.

Different from other settings, the public national lottery in Spain allows us to assess the impact of two other elements of the military service. First, as in many other countries, conscripts can

complete their period of instruction in any of the three armed force branches (Infantry, Navy, or Air Force). Secondly, individuals did not necessarily have to complete their instruction in the province of residence, although authorities over time tried to make conscription be in the province of residence. Specifically, the lottery not only helped the individuals who were allocated to the surplus of conscripts, but also the armed forces branch and the military region of service. Using that information, I construct two dummy variables that are included in equation (2). The first dummy variable,"No Land Military Service (NLMS)", takes a value of one in the case in which an individual was allocated to the Air Force or Navy, and zero otherwise. The second dummy variable, "Migrate due to Military Service (MMS)", takes a value of one in the case in which an individual was sent for service in a military region that does not contain his province of birth, and zero otherwise.[51] Panel C and D present the estimates of the military branch and migration. Panel C presents the estimates for a model where these two variables (conditional on military status) enter additively. That is, the model in Panel C, lets the effect of migration and the effect of army branch be independent of military status. The model in panel D introduces the effect of these two variables just through the interaction with military service. This last model would be the appropriate one in the case in which these two dimensions would operate through military service status and be responsible for a potential heterogeneity of military service in these dimensions. However, as we mention in the previous paragraph, since we do not observe the transition into military service for all the individuals, first, and potential differences in the conscription rate across armed forces branches, it does not enable us to rule out a direct effect. The first element to be noticed is that the effect of military service (Panel C) or the direct effect of military service (Panel D) is practically unchanged with respect to the one reported in Panel A. In fact, for extensive margins, the impact of these two dimensions is of a second order magnitude and in general, insignificant. The only significant effect is observed in the additive model (Panel C) for migration status. Specifically, we observe that individuals who were allocated to conscription away from their province of birth are 0.36pp more likely to not have a Social Security record in a given month. In terms of the effect of the armed forces branch, still in Panel C, we observe that individuals allocated to the Air

[51] See footnote 26 for details.

Force or Navy are not only more likely to see reduced earnings for employees but we also see a direct positive effect on the probability of reporting/suffering from a degree of disability (0.226pp). In fact, for the second model where we let the effect of place of service (migration) and armed forces branch allocation operate through military status, we only observe an impact on these two outcomes coming from the branch of service. Specifically, we observe for employees that the penalty of military service on earnings is increased by approximately 5pp, which is approximately 20% of the direct effect when serving in the Air Force or Navy. Finally, despite not observing a direct effect of military service on job disability, individuals who were sent to the Air Force or Navy are approximately 1.4pp more likely to report a degree of disability.

6 Conclusion

By using Spanish administrative records from the Social Security, I study the impact of compulsory military service on several labor outcomes for a sample of native male Spaniards born between the years 1968 and 1973. On top of individual fixed effect, a random allocation of an excess of conscripts out of military duties through a national lottery is used to address the usual concerns of endogeneity in the treatment.

This paper expands on the literature about the impact of military service on several dimensions. First, I provide evidence for Spain, a country for which we do not have previous evidence. Second, I use for first time the randomization coming from a national lottery for five years as a source of variation in the treatment. Third, several outcomes are analyzed simultaneously, which enable us to study the impact on other dimensions suggested by policymakers. Finally, I study the heterogeneity of the impact of military service by educational levels and place of service.

The results reveal, first, that the lottery associated to the allocation of the surplus of conscripts effectively shifted the probability that some individuals would go through military service. Specifically, individuals with a birthday spared from military duties through the lottery, were 4 to 6 percentage points (pp) less likely to go into military service. Secondly, the results reveal that, differently from OLS or Fixed Effects estimates of the impact of conscription, an allocation out

of service through the lottery is associated with significant benefits in the labor market. Specifically, being spared from service increases the probability of being in the labor market (1.6pp), the likelihood of being employed (1.7pp), tenure in the last job (0.15 years) and monthly earnings (1.9pp). Thirdly, the impact is not restricted to the years of active service; however, for extensive margins such as employment or labor force participation, it wears off over the years. The impact on earnings measures, on the other hand, is present over the complete period under analysis. We also observe that the impact on unemployment is non monotonic and this fact is responsible for missing an influence of military service when looking at the period under analysis as a whole. Fourthly, I present evidence that avoiding military service through the lottery is associated to an increase in labor market experience (0.2 years) and the likelihood of holding a professional or technical degree (2.8pp). The analysis by level of education reveals that the impact on extensive margins is larger for less educated individuals and can be explained by the loss of market experience. The effect on earnings, however, is larger for the group of individuals with higher levels of education and cannot be explained by this loss of experience. Finally, we observe that the impact on earnings is larger for individuals who serve in the Air Force or Navy. In fact, among these individuals it is observed that military service is associated with an increase in the likelihood of suffering from some degree of disability.

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Table 1: Military service

Cohort	Surplus [1]	New Universe [2]	Lottery; Date [3]	Duration [4]	Age [5]
1985	25102 (13%)	Year of birth 1965	Caja de reclutas (CR); (25/11/1984)	18 months	20
1986	75448 (37%)	Year of birth 1966 and 1967 (January-April)	CR (7/11/1985)	12 months	20&19
1987	88833 (30%)	1967(May-Dec); 1968 (Jan-August)	CR (16/11/1986)	12 months	20&19
1988	22879 (10%)	1968 (Sept-Dec) and 1969	National (15/11/1987): 26/08	12 months	20&19
1989	0	1970	National (13/11/1988):26/04	12 months	19
1990	0	1971	National (13/11/1989):03/08	12 months	19
1991	0	1972	National (12/11/1990):27/11	12 months	19
1992	0	1973	National (03/11/1991):09/11	9 months	19

Table 2: Descriptive statistics

Variable	Sample mean	Non lottery winners at before lottery	Uncond diff before lottery	Conditional diff before All Lottery winners	Conditional diff before 1988 Lottery winners
	(1)	(2)	(3)	(4)	(5)
Out of LF	.23	.357	-.001	-.015	.019
	[.421]	[.004]	[.01]	[.014]	[.041]
Employed	.72	.877	.024***	-.003	-.018
	[.449]	[.004]	[.008]	[.011]	[.037]
Unemployment insurance	.052	.123	-.024***	.003	.018
	[.222]	[.004]	[.008]	[.011]	[.037]
Self employed	.152	.067	-.004	.003	-.023
	[.359]	[.003]	[.006]	[.01]	[.029]
Tenure	2.767	1.037	-.025	-.018	.054
	[3.83]	[.009]	[.019]	[.028]	[.099]
Monthly positive earnings	.699	.813	.024**	.015	-.049
	[.459]	[.004]	[.01]	[.014]	[.046]
Monthly labor earnings (all)	814.13	622.26	-77.987***	10.676	-50.625
	[715.68]	[4.446]	[8.71]	[13.219]	[39.494]
Monthly earnings employees	1338.092	779.521	-128.197***	-1.863	-23.232
	[550.933]	[3.849]	[7.614]	[11.532]	[33.215]
Inputed monthly labor earnings	1125.148	754.408	-119.007***	-8.298	-31.334
	[595.373]	[3.638]	[7.239]	[11.044]	[30.691]
Migrated from province	.446	.261	.029**	-.008	.017
	[.497]	[.005]	[.011]	[.017]	[.052]
Job disability	.028	.084	-.013**	.004	.017
	[.165]	[.003]	[.007]	[.01]	[.032]
Military Service	.141	.001	0	.002	.008
	[.348]	[0]	[.001]	[.002]	[.011]
At most elementary educ.	.28	-	-	-	-
	[.449]				
High schl or more	.426	-	-	-	-
	[.494]				

Column 1, sample means with s.d. between brackets.
Column 2, sample means at age 18 (October before the lottery) for non lottery winners.
Column 3, unconditional sample differences between lottery
winners and other individuals at age 18.
Column 4 (5), conditional sample differences for all cohorts (1988 cohort) between
lottery winners and other individuals. Covariates are age and year F.E., and a dummy
that indicates at most elementary education.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.

Table 3: Impact of winning the lottery on the probability of military service. All the individuals

	[1]	[2]	[3]	[4]	[5]
PANEL A:			Military Service, all cohorts		
Lottery surplus winner (LSW)	-.0632***	-.0633***	-.0602***	-.0679***	-.0741***
	[.009]	[.0085]	[.0087]	[.0095]	[.0086]
Obs	11757099	11757099	11757099	11757099	11722007
F-statistic	48.81	55.71	47.66	51.19	73.64
PANEL B:			Military Service, 1988 lottery		
Lottery surplus winner (LSW)	-.0453***	-.0452***	-.0423***	-.0514***	-.0562***
	[.0098]	[.0087]	[.009]	[.0107]	[.0099]
Obs	2512083	2512083	2512083	2512083	2506584
F-statistic	21.56	27.22	22.13	23.19	31.96
PANEL C:			Lottery without surplus		
Lottery winner	-.0017	-.0021	-.0016	-.002	.0023
	[.0066]	[.006]	[.006]	[.0064]	[.006]
Obs	9245016	9245016	9245016	9245016	9215423
Year& Month FE	X	X	X	X	X
Province of Birth FE		X	X	X	X
Age (cubic polynomial)			X	X	X
Month of birth FE				X	X
Experience (cubic polynomial)					X

Notes: Each column corresponds to a specification, with controls signed with an X at the bottom. Standard errors are clustered at the year-month of birth-province cell level.
Specifications in Panel C also include two dummy variables that indicate whether or not the birth month is associated to infantry service and service outside of the province.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 4: Impact of winning the lottery on the probability of military service. Individuals with a working life prior to the lottery.

	[1]	[2]	[3]	[4]	[5]
PANEL A:			Military Service, all cohorts		
Lottery surplus winner (LSW)	-.1289***	-.1259***	-.158***	-.1784***	-.1873***
	[.0229]	[.0248]	[.0255]	[.0268]	[.0244]
Obs	3559633	3559633	3559633	3559633	3544343
F-statistic	31.57	25.73	38.39	44.29	58.75
PANEL B:			Military Service, 1988 lottery		
Lottery surplus winner (LSW)	-.1638***	-.1576***	-.148***	-.1614***	-.1622***
	[.0252]	[.0262]	[.0276]	[.0255]	[.0236]
Obs	520857	520857	520857	520857	518858
F-statistic	42.31	36.23	28.74	40.14	47.09
PANEL C:			Lottery without surplus		
Lottery winner	-.0011	-.0022	.0001	-.0128	-.0104
	[.0165]	[.0156]	[.0152]	[.0165]	[.0161]
Obs	3038776	3038776	3038776	3038776	3025485
Year& Month FE	X	X	X	X	X
Province of Birth FE		X	X	X	X
Age (cubic polynomial)			X	X	X
Month of birth FE				X	X
Experience (cubic polynomial)					X

Notes: Each column corresponds to a specification, with controls signed with an X at the bottom. Standard errors are clustered at the year-month of birth-province cell level.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.
Specifications in Panel C also include two dummy variables that indicate whether or not the birth month is associated to infantry service and service outside the province.

Table 5: Impact of winning the lottery on the probability of military service by educational level

	[1]	[2]	[3]	[4]	[5]
PANEL A:	More than elementary educ.				
Lottery surplus winner (LSW)	-.05***	-.0496***	-.0472***	-.0509***	-.0539***
	[.0092]	[.0088]	[.009]	[.0101]	[.0096]
Obs	8562698	8562698	8562698	8562698	8537641
F-statistic	29.26	32.11	27.41	25.65	31.42
PANEL B:	At most elementary educ.				
Lottery surplus winner (LSW)	-.1024***	-.1044***	-.0956***	-.1126***	-.1254***
	[.0157]	[.0161]	[.0167]	[.0187]	[.0184]
Obs	3194401	3194401	3194401	3194401	3184366
F-statistic	42.26	42.01	32.82	36.32	46.56
Individual FE	X	X	X	X	X
Month and Yr FE		X	X	X	X
Age (cubic polynomial)			X	X	X
Experience (cubic polynomial)				X	X
Province of residence FE					X

Notes: Each column corresponds to a specification, with controls signed with an X at the bottom.
We define as school-dropout those with at most elementary education.
Standard errors are clustered at the year-month of birth-province cell level.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 6: Military service impact on selected outcomes. OLS and Fixed Effects estimates

	Out SS records	Employed	Unemployed	Self-employed	Tenure (yrs)	Monthly Gross earnings	Monthly employee's earnings	Monthly labor earnings All inputed
				Panel A: OLS				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Military Service N	-.08***	.069***	.009***	.01***	.761***	-.008**	-.024***	.071***
	[.001]	[.002]	[.001]	[.003]	[.031]	[.004]	[.004]	[.005]
Obs	13810824	13810824	13810824	13810824	13810824	9176768	7547730	12387141
				Panel B: Fixed Effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Military Service N	-.035***	.02***	.02***	.026***	.523***	.03***	.006	.027***
	[.005]	[.005]	[.001]	[.004]	[.029]	[.005]	[.006]	[.008]
Obs	13810824	13810824	13810824	13810824	13810824	9176768	7547730	12387141

Notes: Each column represents a given outcome specified at the top of the column. Other covariates are calendar year and month fixed effects, month and province of birth fixed effects, a cubic polynomial in age, and a dummy indicating whether or not an individual reached at most elementary education. In the Fixed Effect, all the variables fixed over time at the individual level are dropped. Standard errors are clustered at the year-month-province of birth cell.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.

Table 7: Impact of winning the lottery on market experience and education.

	(1) Experience (yrs)	(2) Less than Schl. graduate	(3) Read & Write	(4) HS or more	(5) Professional educ.
PANEL A:					
Lottery surplus winner (LSW)	.227***	.012	.007	.018	.028**
	[.075]	[.013]	[.005]	[.015]	[.014]
Obs	10628330	13810824	3860256	9950568	9950568
PANEL B:	Dynamic specification				
LSW 19-20	-.009				
	[.095]				
LSW 21-25	.144**				
	[.07]				
LSW 26-32	.23***				
	[.083]				
LSW 33+	.279***				
	[.099]				

Notes: Each column represents a given outcome whose name is specified at the top. The coefficient reported in Panel A corresponds to the variable indicating whether or not an individual is defined as a lottery winner. In Panel B, the reported coefficients are the ones of the interaction of the variable indicating lottery winners and dummy are the ones of the interaction of the variable indicating lottery winners and a dummy associated to the age group reported in the first column.
Other covariates are calendar month and year fixed effects, month and province of birth fixed effects, and age fixed effects.
Standard errors are clustered at the year-province-month of birth cell.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.

Table 8: Impact of winning the lottery on selected labor outcomes.

	(1) Out SS records	(2) Employed	(3) Unemployed	(4) Self-employed	(5) Tenure (yrs)	(6) Migrated from province	(7) Job permanent or transitory
Panel A:				Complete sample			
				Uncond. on experience			
	-.016***	.017***	-.001	.002	.151**	-.001	.001
	[.004]	[.005]	[.002]	[.007]	[.074]	[.009]	[.002]
				Cond. on experience			
	-.006**	.006*	-.001	-.002	.015	.007	.002
	[.003]	[.003]	[.002]	[.007]	[.06]	[.008]	[.002]
Obs	13754855	13754855	13754855	13754855	13754855	13754855	13754855
Panel B:				Complete sample by level of education			
Less educ.	-.021**	.024***	-.004	.009	.208*	.006	.003
	[.008]	[.009]	[.003]	[.013]	[.125]	[.015]	[.005]
Obs	3860256	3860256	3860256	3860256	3860256	3860256	3860256
More educ.	-.014***	.013**	0	-.002	.123	-.003	.001
	[.005]	[.006]	[.002]	[.008]	[.086]	[.011]	[.003]
Obs	9950568	9950568	9950568	9950568	9950568	9950568	9950568
Panel C:				Sample: Indiv. with long working lifes			
All	-.017	.023*	-.007	.037*	.508**	.013	.011*
	[.011]	[.014]	[.004]	[.02]	[.202]	[.024]	[.006]
Obs	4403652	4403652	4403652	4403652	4403652	4403652	4403652
Less educ	-.009	.014	-.006	.035	.361	.032	.014*
	[.016]	[.018]	[.005]	[.027]	[.278]	[.028]	[.008]
Obs	1836192	1836192	1836192	1836192	1836192	1836192	1836192
Panel D:				Sample: Indiv. from larger provincies			
All	-.014**	.014**	-.001	-.001	.138	.002	.003
	[.006]	[.007]	[.003]	[.008]	[.098]	[.014]	[.003]
Obs	6798984	6798984	6798984	6798984	6798984	6798984	6798984
Less educ	-.036***	.035***	0	.023	.094	-.01	.004
	[.012]	[.013]	[.004]	[.019]	[.153]	[.027]	[.008]
Obs	1653204	1653204	1653204	1653204	1653204	1653204	1653204
Panel E:				Sample: Cohorts without surplus			
	.004	-.006	.002	.003	-.116**	0	.002
	[.004]	[.004]	[.002]	[.006]	[.057]	[.009]	[.002]
Obs	7063504	7063504	7063504	7063504	7063504	7063504	7063504

Each column represents a given outcome whose name is specified at the top. Panels A and B present the results for the complete sample. Panel C onward presents the results for the samples indicated at the top of the panel and subsamples, indicated in the first column. The coefficient reported corresponds to the variable indicating whether or not an individual is defined as a lottery winner. Other covariates are calendar month and year fixed effects, month and province of birth fixed effects, age fixed effects, and a dummy indicating whether or not an individual reached at most elementary education. Standard errors are clustered at the year-province-month of birth cell.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.

Table 9: Impact of winning the lottery on selected labor outcomes. Dynamic specification.

	(1) Out SS records	(2) Employed	(3) Unemployed	(4) Self-employed	(5) Tenure (yrs)	(6) Migrated from province	(7) Job permanent or transitory
Panel A:				Uncond. on experience			
LSW 19-20	-.061***	.074***	-.01***	.016*	.069	-.042***	-.002
	[.01]	[.01]	[.003]	[.01]	[.045]	[.011]	[.003]
LSW 21-25	-.018*	.011	.007*	-.001	.084*	-.008	.004
	[.01]	[.009]	[.004]	[.007]	[.046]	[.011]	[.003]
LSW 26-32	-.02***	.02***	-.001	-.001	.158**	-.005	.003
	[.005]	[.006]	[.002]	[.008]	[.062]	[.01]	[.003]
LSW 33+	-.004	.007	-.004	.002	.191	.011	0
	[.005]	[.006]	[.003]	[.01]	[.135]	[.011]	[.003]
				Cond. on experience			
LSW 19-20	-.065***	.075***	-.01***	.018*	.1***	-.044***	-.002
	[.008]	[.009]	[.003]	[.01]	[.032]	[.011]	[.003]
LSW 21-25	0	-.005	.006	-.004	.029	.005	.003
	[.007]	[.007]	[.004]	[.007]	[.04]	[.009]	[.003]
LSW 26-32	-.006	.006	0	-.006	.033	.007	.003
	[.004]	[.005]	[.002]	[.008]	[.056]	[.009]	[.003]
LSW 33+	.002	0	-.002	-.002	-.019	.017	.001
	[.004]	[.005]	[.003]	[.01]	[.118]	[.011]	[.003]

Each column represents a given outcome whose name is specified at the top. Panel A presents the results for the prefered specification. Panel B adds a cubic polynomial in experience to the control. The coefficient reported corresponds to the variable indicating whether or not an individual is defined as a lottery winner. Other covariates are calendar month and year fixed effects, month and province of birth fixed effects, age fixed effects, and a dummy indicating whether or not an individual reached at most elementary education.
Standard errors are clustered at the year-province-month of birth cell.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.

Table 10: Impact of winning the lottery on earnings.

	(1) Monthly positive earnings	(2) Monthly Gross earnings	(3) Monthly employee's earnings	(4) Monthly labor earnings All inputed
Panel A:		Complete sample		
		Uncond. on experience		
	.017***	.019**	.027***	.045***
	[.005]	[.009]	[.01]	[.014]
		Cond. on experience		
	.006*	.017*	.023**	.031**
	[.004]	[.009]	[.01]	[.013]
Obs	13754855	9174916	7546179	12350488
Panel B:		Complete sample by level of education		
Less educ.	.024**	.012	.023	.059**
	[.01]	[.015]	[.017]	[.023]
Obs	3860256	2506173	1906082	3423592
More educ.	.014**	.022*	.028**	.04**
	[.006]	[.011]	[.012]	[.016]
Obs	9950568	6670595	5641648	8963549
Panel C:		Sample: Indiv. with long working lifes		
All	.024*	0	.027	.025
	[.014]	[.021]	[.022]	[.03]
Obs	4403652	2864158	2392703	4115572
Less educ	.014	-.01	.022	.025
	[.018]	[.025]	[.023]	[.035]
Obs	1836192	1180992	968537	1711963
Panel D:		Sample: Indiv. from larger provinces		
All	.016**	.009	.013	.022
	[.007]	[.012]	[.013]	[.018]
Obs	6798984	4463743	3883665	6206901
Less educ	.035**	-.002	.027	.067**
	[.015]	[.025]	[.026]	[.028]
Obs	1653204	1056061	860326	1503260
Panel E:		Sample: Cohorts without surplus		
	-.007	-.003	.004	.002
	[.005]	[.009]	[.01]	[.013]
Obs	7063504	5000918	4105708	6454792

Each column represents a given outcome whose name is specified at the top. Panels A and B present the results for the complete sample. Panel C onward presents the results for the samples indicated at the top of the panel and subsamples, indicated in the first column. The coefficient reported corresponds to the variable indicating whether or not a individual is defined as a lottery winner. Other covariates are calendar month and year fixed effects, month and province of birth fixed effects, age fixed effects, and a dummy indicating whether or not an individual reached at most elementary education. Standard errors are clustered at the year-province-month of birth cell.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.

Table 11: Impact of winning the lottery on earnings. Dynamic specification.

	(1) Monthly positive earnings	(2) Monthly Gross earnings	(3) Monthly employee's earnings	(4) Monthly labor earnings All inputed
Panel A:		Uncond. on experience		
LSW 19-20	.066***	.043***	.044***	.042*
	[.011]	[.011]	[.016]	[.023]
LSW 21-25	.014	.027***	.031***	.027
	[.009]	[.01]	[.012]	[.023]
LSW 26-32	.019***	.021**	.03***	.062***
	[.006]	[.009]	[.01]	[.015]
LSW 33+	.009	.013	.021*	.042***
	[.006]	[.011]	[.012]	[.015]
		Cond. on experience		
LSW 19-20	.071***	.042***	.046***	.05**
	[.01]	[.01]	[.015]	[.02]
LSW 21-25	-.003	.021**	.022*	.003
	[.007]	[.01]	[.012]	[.021]
LSW 26-32	.004	.018*	.025**	.043***
	[.005]	[.009]	[.01]	[.014]
LSW 33+	.001	.013	.019*	.032**
	[.005]	[.011]	[.012]	[.015]

Each column represents a given outcome whose name is specified at the top. Panel A presents the results for the prefered specification. Panel B adds a cubic polynomial in experience to the control. The coefficient reported corresponds to the variable indicating whether or not an individual is defined as a lottery winner. Other covariates are calendar month and year fixed effects, month and province of birth fixed effects, age fixed effects, and a dummy indicating whether or not an individual reached at most elementary education.
Standard errors are clustered at the year-province-month of birth cell.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.

Table 12: Military service impact on selected outcomes.

	Out SS records	Employed	Self-employed	Tenure (yrs)	Migrated from province	Job permanent or transitory disability	Monthly Gross earnings	Monthly employee's earnings
PANEL A:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Military Service (MS)	.2318***	-.2441***	-.02326	-2.19297*	.02037	-.02173	-.24934*	-.33911**
	[.0798]	[.08916]	[.10352]	[1.18889]	[.13334]	[.03507]	[.12804]	[.13648]
Obs	13810824	13810824	13810824	13810824	13810824	13810824	9176768	7547730
PANEL B:	Sample of individuals with at most elementary educ.							
MS	.19039**	-.21825**	-.08336	-1.8807	-.05119	-.02906	-.09893	-.16499
	[.08424]	[.09453]	[.12064]	[1.16503]	[.13853]	[.04566]	[.12109]	[.13014]
Obs	3860256	3860256	3860256	3860256	3860256	3860256	2506173	1906082
	Impact of Armed Forces Branch and Place of Service							
PANEL C:	Additive model							
MS	.23621***	-.24703***	-.01498	-2.17143*	.02239	-.02078	-.25971**	-.3496**
	[.08018]	[.08966]	[.10373]	[1.19358]	[.13329]	[.03511]	[.13016]	[.13974]
NLMS	-.0029	.00185	-.00021	.0085	-.00677*	.00226**	-.00539	-.00804*
	[.00253]	[.00276]	[.00338]	[.03344]	[.00398]	[.00099]	[.00429]	[.00482]
MMS	.00361*	-.00236	.00402	.00566	.00454	-.00075	-.00288	-.00161
	[.00219]	[.00237]	[.00279]	[.02933]	[.00357]	[.00087]	[.00365]	[.0042]
PANEL D:	Multiplicative model							
MS	.19648***	-.20766***	-.04716	-2.16951**	-.04882	-.01018	-.18912*	-.26948**
	[.06557]	[.07294]	[.09285]	[1.04743]	[.10973]	[.03386]	[.11414]	[.1269]
MS*NLMS	-.01699	.00963	-.00013	.07723	-.03815	.01349**	-.03601	-.05489*
	[.01605]	[.01754]	[.02241]	[.21665]	[.0254]	[.00651]	[.02503]	[.02905]
MS*MMS	.02286	-.01442	.02567	.00224	.02525	-.00368	-.0154	-.00635
	[.01422]	[.01543]	[.01879]	[.19466]	[.02364]	[.00583]	[.02155]	[.02548]

Each column represents a given outcome specified at the top of the column. Panel A and B, 2SLS estimates of the impact of going through Military Service (MS) with the lottery winner status as its instrument for the complete sample and indiv. less educated samples, respectively. Panel B and C present, additionally, the estimates of the impact serving in the Air Force or Navy with respespect to Infantry (NLMS), and whether or not had served in province other than one of birth (MMS). The model in Panel C uses just lottery status as instrument while in Panel D, additionally its interaction with NLMS, MMS and the these two variables in levels. Other covariates are calendar month and year fixed effects, month and province of birth fixed effects, age fixed effects, and a dummy indicating whether or not an individual reached at most elementary education. Standard errors are clustered at the year-province-month of birth cell.
* $p < 0.1$; ** $p < 0.05$;*** $p < 0.01$.