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Heterogeneity of the Effects of Compulsory Military Service on Income: Evidence from Russia

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Abstract

This paper summarizes evidence on the effects of military service on income and wage using individual level data on Russian males from RLMS survey. The main finding is that an additional year of military service decreases the wage of young people on average by 12%. This result was possible to obtain using the legal decrease of the term of compulsory military service in Russia in 2008. I also examined the effect of the whole military service. I found that on average the income of military veterans is lower. However, the difference is not statistically significant. It is significant only for the subpopulation of males who studied at college and were born in city and it is negative. Using IV approach I managed to obtain the result that military service decreases the wage of males of ages between 30 and 45 on average by 30%.

Contents

1 Introduction

The effects of military service are of great importance for policymakers. One needs to know these in order to decide whether the army veterans need to be given some sort of compensation from the government. If the effects are indeed negative one needs to determine the ways of fair compensation for the veterans. It may be the case that compulsory military service has especially negative consequences for males because it requires all of them to serve in army, including those whose opportunity costs of it are very high. This research deals with the effects of compulsory military service in Russia.

In recent time there were several papers devoted to the effects of compulsory military service on earnings (Card and Cardoso, 2012; Angrist and Chen, 2011; Angrist et al., 2011; Grenet et al., 2011; Paloyo, 2010), education (Keller et al., 2009; Bauer et al., 2009), health (Dobkin and Shabani, 2009; Autor et al., 2011) and even crime (Galiani et al., 2011).

The conclusions of various researchers about the effects of military service on earnings are different. Berger and Hirsch (1983) studied earnings of Vietnam-era veterans and found that only persons who had no complete high school education benefited from having veteran status while the overall difference in earnings for all the rest was very small. Later, Angrist (1990) showed that in early 1980s the earnings of white Vietnam-era veterans were lower than those on non-veterans by roughly 15% and suggested that the difference might be attributed to lower value of military service experience in the view of civilian labor market. However, Angrist and Chen (2011) showed that 50 years old Vietnam-era veterans' earnings only slightly differs from that of non-veterans.

Imbens and van der Klaauw (1995) reported negative effects of compulsory military service on earnings in the Netherlands. In contrast, Albrecht et al. (1999) found positive wage premium of veterans in Sweden. Bauer et al. (2009) and Grenet et al. (2011) found no effect at all for West German and British veterans. Card and Cardoso (2012) reports results similar to that of Berger and Hirsch (1983) for Portuguese veterans born in 1967. More precisely, they found significant 4-5 percentage points increase in the wages of men with only primary education and no significant effect on the wages of men with higher education.

The conclusions on the effects of military service on health are more consistent among various researchers. A certain number of papers document greater health problems of military service veterans in United States. Card (1987) showed that US Vietnam-era veterans suffer from posttraumatic stress disorder oftener than non-veterans. McKinney et al. (1997) documented greater smoking rates among veterans. Hoge et al. (2004) found higher rate of mental health problems among veterans served in Iraq and Afghanistan. Using draft eligibility lottery in order to deal with omitted variable bias, Hearst et al. (1986) found negative health effects of military service. In particular, the authors showed 4% increase of mortality rate among eligible men. Bedard and Deschênes (2006) applied instrumental variables approach and found that mortality rates were higher among veterans of World War II and Korean War that those among non-veterans. Moreover, they showed that the main reason for higher mortality rates were increased smoking rates caused by military service. However, Dobkin and Shabani (2009) did not find statistically significant effect of military service on health of Vietnam-era veterans.

The above variety of conclusions about the effects of military service is probably caused by the differences of military service in different countries and periods. Various countries provide different benefits for veterans and the military service in different countries provide various occupational training. For example, Card and Cardoso (2012) mention that in Portugal conscripts may undertake occupational training in professional driving, cooking and emergency medical support. Moreover, the conscripts are guaranteed that the training is equivalent to civilian one.

My research is devoted to study of the effects of Soviet and Russian military service. I use several estimation strategies in order to examine the effects of military service on income and wages. This paper benefits existing literature for several reasons. First, the law which decreased the term of compulsory military service after 2007 provides unique natural experiment which allows me to estimate the effect of of decreasing the term of compulsory military service by a year on wage. Second, this paper is the first research on the effects of Russian compulsory military service. The conscription system in Russia was created by Peter I in 18th century. Since that time and until nowadays the military service is mandatory. Only the term of service was gradually decreasing and since 2008 it is only 1 year.

The rest of the paper is organized as follows. Section 2 describes data set and certain modifications of it. Section 3 reports summary statistics of various variables from the data set. Section 4 contains the findings about correlations between income and military service. The estimation strategy is OLS. Section 5 is devoted to the estimation of the effect of an additional year of compulsory military service on wage. The estimation strategy is difference in difference. Section 6 contains the results applying IV approach to estimate the long-run effects of military service on wage. Section 7 concludes. Section 8 contains the appendix describing the procedure of correction wages and incomes for inflation.

2 Data and variables

The data source used in this research is the Russian Longitudinal Monitoring survey (`http://www.cpc.unc.edu/rlms`), rounds 5-20 which cover period from

1994 to 2011[1]. I will use only data on males. This survey provides nationally representative data on more than 10000 adults per year. The sample of dwellings obtained as a random draw from the population of the census of 1989 is surveyed every year. In order to keep national representation feature of the data, new dwellings are added in the rounds of survey.

There are various variables used in the regressions in the next sections. A closer look at the data set revealed that the majority of people report their answers to survey questions not in all rounds. That is in data set for many individuals some variables have some values in several rounds and undefined in all the rest rounds. While for some variables the reported values cannot be used to fill their values in all the rounds where they are undefined[2], for some this is the case and this was done. I define two types of variables. The first type is fixed variable. This is a variable the value of which for every person should be the same for all rounds. Examples of such variables are birth year, place of birth, the year of entering/finishing the military service. The variables of this type are easy to be extended to all rounds. If the values of such variable are defined in some rounds and are the same, then the undefined values of this variable may be replaced by this value. The second type is consecutive dummy variable. This is a variable which takes only values 0 or 1 and may not be the same during all the rounds but if it takes the value of 1 in some round it cannot take zero value in any other rounds. The examples of such variable are indicators of having complete college/university education, having done military service, having ever been in hospital. A variable of this type can only be extended in the following way. Its values may be set to zero for all rounds up to the last one when its value is defined and is equal to zero. Its values may be set to one for all rounds starting from the first one when its value is defined and equal to 1.

There are certain requirements of consistency for these type of variable to be extended. All the defined values of fixed variable should be the same. For the consecutive dummy variable it must not be the case that its defined value is equal to zero if in some previous rounds one of its defined values is equal to one. Simply speaking, the first 1 should follow the last 0. However, the answers reported by some persons do not satisfy these requirements. There are people who first report that they have college education and then in one of the next rounds report the opposite. Also, for some people the indicator of birthplace type changes from round to round. The extended versions of variables for such people copy the original reported values. I denote these people as people giving inconsistent answers (PGIA). In what follows I always use extended versions of variables keeping the original values for PGIA. I do not exclude PGIA from regressions because after

[1]There were no surveys in 1997 and 1999.

[2]For example, person's weight, height, health evaluation.

extension the number of observations corresponding to PGIA is very small.

3 Summary statistics

Here I present summary statistics on various variables of interest. The variables are

- *army* = 1 if a person served in military service and 0 otherwise;
- *armyyb* is the year when a person began their military service;
- *armyye* is the year when a person completed their military service;
- *bornInCity* is equal to 1 if a person was born in city and 0 otherwise;
- *city* is equal to 1 if a person was interview in city (which is equivalent to living in city) and 0 otherwise;
- $logWage = \log(1 + wage)$;
- $logIncome = \log(1 + income)$;
- *evalhl* is a person's evaluation of their health condition[3]; *age* is a person's age;
- *experi* is proxy for work experience[4];
- *college* = 1 if a person has college of university degree and 0 otherwise.

The extended versions of variable contains prefix *ext*. This is done only in this section. In all regressions I use extended versions of variables without writing *ext* in their names.

The income and wage variable are corrected for inflation and expressed in terms of year 2000 prices. See appendix for brief description of the correction procedure.

The variable *army* is a consecutive dummy. However, because of its importance and extremely small number of observations on it, I extend it not like all other consecutive dummies. Namely, let $army'$ be the extension of *army* obtained by the

[3] takes the integer values from 1 (very good health) to 5 (very bad health)

[4] *experi* is equal to *age* - 18 for people without college degree and *age* - 22 for people with college degree

procedure for consecutive dummy extension as described in the previous section. Then, the extended version of *army* is obtained as

$$extArmy_{it} = \begin{cases} 1, & \text{if } t \geq extArmyyb_{it}, \max_t\{armyyb_{it}\} = \min_t\{armyyb_{it}\}, \\ & \text{and } extArmyyb_{it} \text{ is observed,} \\ 0, & \text{if } t \leq extArmyyb_{it}, \max_t\{armyyb_{it}\} = \min_t\{armyyb_{it}\}, \\ & \text{and } extArmyyb_{it} \text{ is observed,} \\ army', & \text{if } \max_t\{armyyb_{it}\} \neq \min_t\{armyyb_{it}\}, \\ & \text{or } extArmyyb_{it} \text{ is not observed.} \end{cases}$$

The summary statistics presented in table 1. The numbers of observations for variable related to military service are small because the questions about military service were asked only in rounds 14 and 20. The total number of different males in the data set is 11318.

Table 1: Summary statistics.

Variable	Mean	St. D.	Min	Max	# of obs.	# of PGIA
army	0.6237	0.4845	0	1	8997	45
extArmy	0.6693	0.4705	0	1	46357	45
armyyb	1981	15	1935	2011	5520	262
extArmyyb	1979	15	1935	2011	30775	262
armyye	1983	15	1938	2011	5517	283
extArmyye	1981	15	1938	2011	30491	283
bornInCity	0.3974	0.4894	0	1	39863	817
extBornInCity	0.3775	0.4848	0	1	69831	817
city	.4020	.4903	0	1	74082	
logWage	8.0024	0.9046	0	11.5740	36240	
logIncome	6.2935	3.1732	0	12.4086	71113	
experi	22	16	0	78	56204	
evalhl	2.6907	0.7352	1	5	73866	

4 Income and military service correlations

In this section I use OLS estimators in order to look at correlations between income and military service dummy controlling for several factors which are known to have effects on income. I restrict the sample to males of age between 25 and 65 years (in order to focus on working age) who were interviewed in years after 1997 (in order to ignore periods of high inflation and 1998 crisis). All the regressions presented in this section are estimated using tobit model. The standard errors estimated using clustered sandwich estimator by individual level (in this and all the next sections).

First, I consider the following regression model:

$$\begin{aligned}\log(1+\text{income}_{it}) = \beta_0 + \beta_1 \mathrm{I}(\text{Served in army})_{it} \\ + \beta_2 \text{experi}_{it} + \beta_3 \mathrm{I}(\text{Live in city})_{it} + \beta_4 \text{evalhl}_{it} \\ + \beta_5 \mathrm{I}(\text{Have college degree})_{it} + \beta_6 \mathrm{I}(\text{Was born in city})_{it} \\ + \sum_t \delta_t \mathrm{I}(\text{round}_{it} = t) + \sum_r \gamma_r \mathrm{I}(\text{region}_{it} = r) + u_{it}.\end{aligned}$$

The results of estimation of βs are presented in table 2. There is no statistically significant correlation between military service and income. The signs of all the rest coefficients are standard.

Now I look at the correlation between income and military service in various subpopulations. First I consider the subpopulation of males with college or university degree and that without such degree. This is done through the estimation of the following single regression model:

$$\begin{aligned}\log(1+\text{income}_{it}) = r_{0,it} + r_{1,it} \mathrm{I}(\text{Have college degree})_{it} \\ + \sum_t \delta_t \mathrm{I}(\text{round}_{it} = t) + \sum_r \gamma_r \mathrm{I}(\text{region}_{it} = r) + u_{it},\end{aligned}$$

where

$$\begin{aligned}r_{m,it} = \beta_{m,0} + \beta_{m,1} \mathrm{I}(\text{Served in army})_{it} \\ + \beta_{m,2} \text{experi}_{it} + \beta_{m,3} \mathrm{I}(\text{Live in city})_{it} + \beta_{m,4} \text{evalhl}_{it} \\ + \beta_{m,5} \mathrm{I}(\text{Was born in city})_{it},\ m = \overline{0,1}.\end{aligned}$$

The sign of $\beta_{0,1}$ shows the sign of correlation between income and military service dummy for the males without college degree while the sign of the sum $\beta_{0,1} + \beta_{1,1}$ shows that for the males without college degree. I do not split fixed effects of year and region into subpopulations fixed effects in order not to include too many unknown parameters in the model.

The estimates of βs are shown in table 3. Since in this section I am interested only in correlation between income and military service, I summarize the estimates of $\beta_{0,1}$ and $\beta_{0,1} + \beta_{1,1}$ with their p-values in table 4.

The signs of estimates in table 4 look very intuitive. However none of them is statistically significant even at 10 % level.

Table 2: Income and army – whole population (estimates)

VARIABLES	
I(Served in army)	-0.0480
	(0.0764)
Work experience	0.00527*
	(0.00274)
I(Live in city)	2.126***
	(0.213)
Health self-evaluation	-0.267***
	(0.0474)
I(Have college degree)	0.695***
	(0.0692)
I(Was born in city)	0.106
	(0.0733)
Constant	8.160***
	(0.251)
Observations	21584
Number of persons	4973

Standard errors adjusted for clusters formed by individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Income and army – 2 subpopulations (estimates)

VARIABLES	Without college degree (m = 0)	With college degree (m = 1)
I(Served in army)	0.00268	-0.173
	(0.0906)	(0.137)
Work experience	0.00464	0.000306
	(0.00306)	(0.00519)
I(Live in city)	2.152***	-0.312**
	(0.203)	(0.138)
Health self-evaluation	-0.266***	0.0790
	(0.0509)	(0.0935)
I(Was born in city)	0.137*	-0.175
	(0.0812)	(0.137)
Constant	7.010***	0.806***
	(0.246)	(0.269)
Observations	21584	
Number of persons	4973	

Standard errors adjusted for clusters formed by individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Income and army – 2 subpopulations (parameters of interest)

Have no college degree	Have college degree
0.0027	-0.1705
(0.9764)	(0.1035)

***p*-values** in parenthesis (Null hypothesis – linear combination is equal to zero).
number of obs.: 21584
number of persons: 4973

The last regression in this section is estimated in order to check the signs of correlation between income and military service for four subpopulations determined by whether a person has college degree and whether they were born in city. The reason I separate people on the basis of type of their birthplace is that people who were born not in city differ from those who were born in city in several ways. The former most probably finished school not in city which made them more difficult to enter one of top colleges. Also they may be less adapted to life in city.

The model I estimate is the following:

$$
\begin{aligned}
\log(1+\text{income}_{it}) = r_{00,it} & \\
& + r_{01,it}\mathrm{I}(\text{Have no college degree and born in city})_{it} \\
& + r_{10,it}\mathrm{I}(\text{Have college degree and born not in city})_{it} \\
& + r_{11,it}\mathrm{I}(\text{Have college degree and born in city})_{it} \\
& \qquad + \sum_t \delta_t \mathrm{I}(\text{round}_{it} = t) + \sum_r \gamma_r \mathrm{I}(\text{region}_{it} = r) + u,
\end{aligned}
$$

where

$$
\begin{aligned}
r_{mp,it} = \beta_{mp,0} + \beta_{mp,1}\mathrm{I}(\text{Served in army})_{it} + \beta_{mp,2}\text{experi}_{it} & \\
\beta_{mp,3}\mathrm{I}(\text{Live in city})_{it} + \beta_{mp,4}\text{evalhl}_{it},\ m = \overline{0,1},\ p = \overline{0,1}.
\end{aligned}
$$

The results of estimation of this regression model are summarized in table 5. The relations between income and military service for various subpopulations are measured by $\beta_{00,1}$, $\beta_{00,1}+\beta_{01,1}$, $\beta_{00,1}+\beta_{10,1}$, $\beta_{00,1}+\beta_{11,1}$. The estimates of these linear combinations along with their p-values (from F test) are presented in table 6.

The only significant estimate of regression coefficients in table 6 is that for the subpopulation of males who were born in city and have college or university degree and the sign of the estimate is negative. However, from this one cannot conclude that military service has negative effect on people's income because of self-selection issue. It may be the case that people who do military service have lower ability to study and finish good college or university because those more able have greater incentives to escape from military service and begin their career earlier.

5 The effect of an additional year of military service

In this section I concentrate on the effect of an additional year of military service on wage. On June 14, 2006 the State Duma of Russian Federation approved the

Table 5: Income and army – 4 subpopulations (estimates)

VARIABLES	$(m=0,p=0)$	$(m=1,p=0)$	$(m=0,p=1)$	$(m=1,p=1)$
I(Served in army)	-0.0615	0.0502	0.198	-0.255
	(0.117)	(0.193)	(0.172)	(0.185)
Work experience	0.00633*	0.00464	-0.00405	0.000912
	(0.00376)	(0.00750)	(0.00619)	(0.00717)
I(Live in city)	2.256***	-0.168	-0.334*	-0.517**
	(0.214)	(0.159)	(0.191)	(0.204)
Health self-evaluation	-0.249***	-0.0688	0.268**	-0.148
	(0.0645)	(0.0975)	(0.128)	(0.122)
Constant	6.910***	0.0521	0.318	1.460***
	(0.274)	(0.367)	(0.300)	(0.354)
Observations		21584		
Number of persons		4973		

Standard errors adjusted for clusters formed by individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Income and army – 4 subpopulations (parameters of interest)

	college degree	no college degree
born in city	-0.3166**	0.1365
	(0.0280)	(0.2823)
born not in city	-0.0113	-0.0615
	(0.9415)	(0.6001)

***p*-values** in parenthesis.
number of obs.: 21584
number of persons: 4973

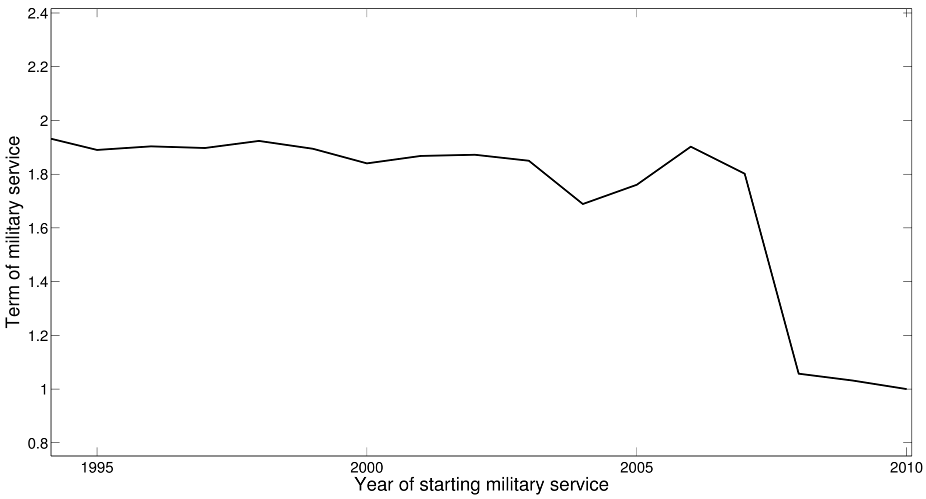

Figure 1: Terms of military service.

law on the changes of terms of compulsory military service in Russia. Males drafted between October 1, 2007 and January 1, 2008 had to serve in military force for 18 months. Males drafted after January 1, 2008 had to serve in military force for 1 year.

This change in the terms of military service is reflected in the data. In figure 1 I plot the averages of observed terms of military service against the year of starting military service.

I use this change in the law in order to evaluate the effect of additional year of military service on wage. For this I apply difference in difference methodology and estimate the following regression

$$\begin{aligned}\log(1+\text{wage}_{it}) = \beta_0 &+ \beta_1 \text{I(Served in army)}_{it} \\ &+ \beta_2 \text{I(Served in army)}_{it}\text{I(Started military service after 2007)}_{it} \\ &+ \beta_3 \text{experi}_{it} + \beta_4 \text{I(Live in city)}_{it} + \beta_5 \text{evalhl}_{it} \\ &+ \beta_6 \text{I(Have college degree)}_{it} + \beta_7 \text{I(Was born in city)}_{it} \\ &+ \sum_t \delta_t \text{I}(\text{round}_{it} = t) + u_{it}. \quad (1)\end{aligned}$$

I estimate this model on the subsample of males interviewed in years after 2008 and who were born after 1979. The restriction of year of interview is put because before 2008 there was no people who had started their military service after 2008. The restriction on birthyear is made in order to compare only males who are not very different in their life styles. The effect of additional year of military service on wage is measured by $-\beta_2$.

It is worth noting that different years of military service may have different effects on wage. It is plausible to assume that the effects of second and third years of military service are the same. However, the effects of first and second years of military service are not the same because the effect from the first year of military service includes the general effect of military service. Therefore, to be more rigor, I should say that in this section I estimate the effect of the second year of military.

The estimates of model coefficients are shown in table 7. The estimate of β_2 is positive and statistically significant at 10% level. It says that the second year of military service lowers the wage by 12% on average. Taking into account the sample restrictions I have put I may conclude that this decrease of wage is a short-run effect of second year of military service. Notice that since I control for the work experience this negative effect cannot be caused only by the loss of a year of experience.

In order to study the nature of this negative effect deeper I use difference in difference approach to see whether the second year of military service has effect of several characteristics which affect wage. More precisely, I estimate the following model

$$\begin{aligned} y_{it} = \beta_0 &+ \beta_1 \mathrm{I}(\text{Served in army})_{it} \\ &+ \beta_2 \mathrm{I}(\text{Served in army})_{it} \mathrm{I}(\text{Started military service after 2007})_{it} \\ &+ \beta_3 \mathrm{age}_{it} + \beta_4 \mathrm{I}(\text{Live in city})_{it} + \beta_5 \mathrm{evalhl}_{it} \\ &+ \beta_6 \mathrm{I}(\text{Have college degree})_{it} + \beta_7 \mathrm{I}(\text{Was born in city})_{it} \\ &\qquad + \beta_8 \log(1 + \mathrm{wage}_{it}) + \sum_t \delta_t \mathrm{I}(\mathrm{round}_{it} = t) + u_{it}, \end{aligned}$$

For y I try the following variables: I(a person smokes), I(a person had a surgical operation in last 12 months), health self-evaluation[5].

The results of estimation are shown in table 8. We see that there is no effect of the second year of military service on any of variables put in place of y. However the signs of the estimates look intuitive. We see that on average people started their military service after 2008 smoke less and are healthier.

6 Instrumental variables approach

In this section I use instrumental variables approach in order to estimate the long-run effect of military service on wage. The instrument I use is the year of

[5] in this case the variable *evalhl* is removed from the right-hand side of the regression model.

Table 7: The effect of second year of miliary service on wage

VARIABLES	
I(Served in army)	0.0601
	(0.0480)
I(Served in army)I(Started MS after 2007)	0.122*
	(0.0724)
Work experience	0.0491***
	(0.00809)
I(Live in city)	0.146**
	(0.0631)
Health self-evaluation	-0.0810**
	(0.0343)
I(Have college degree)	0.325***
	(0.0524)
I(Was born in city)	0.133**
	(0.0631)
Constant	8.017***
	(0.109)
Observations	1,627
Number of persons	967

Standard errors adjusted for clusters formed by individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 8: The effect of second year of military service on various variables

VARIABLES	I(a person smokes)	I(had a surgery in last 12 months)	Health self-evaluation
I(Served in army)	0.0350	0.00153	-0.152***
	(0.0370)	(0.00762)	(0.0400)
I(Served in army)	-0.0191	-0.00491	-0.116
I(Started MS after 2007)	(0.0723)	(0.0211)	(0.0765)
Age	0.0204***	0.000389	0.00186
	(0.00592)	(0.00144)	(0.00708)
I(Live in city)	-0.0819*	0.00194	0.0273
	(0.0471)	(0.00938)	(0.0582)
Health self-evaluation	0.0431*	-0.00966	
	(0.0240)	(0.00717)	
I(Have college degree)	-0.255***	0.00431	-0.0570
	(0.0411)	(0.00844)	(0.0466)
I(Was born in city)	0.00620	0.00444	-0.0377
	(0.0451)	(0.00910)	(0.0556)
$\log(1 + \text{wage})$	0.0000815	-0.00933	-0.0617**
	(0.0189)	(0.00611)	(0.0257)
Constant	0.0881	2.096***	2.890***
	(0.213)	(0.0548)	(0.254)
Observations	1,621	1,625	1,627
Number of persons	966	967	967

Standard errors adjusted for clusters formed by individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Figure 2: I(Served in army) and year of birth.

birth. The year of birth is correlated with the probability of being drafted because the latter became to decrease for males born in 1971 and later (see figure 2).

I would like to estimate the following model

$$\begin{aligned}\log(1+\text{wage}_{it}) = \beta_0 + \beta_1 \text{I(Served in army)}_{it} \\ + \beta_2 \text{experi}_{it} + \beta_3 \text{I(Live in city)}_{it} + \beta_4 \text{evalhl}_{it} \\ + \beta_5 \text{I(Have college degree)}_{it} + \beta_6 \text{I(Was born in city)}_{it} \\ + \sum_t \delta_t \text{I}(\text{round}_{it} = t) + u_{it} \quad (2)\end{aligned}$$

and use the year of birth as the instrument for I(Served in army). However the year of birth is strongly correlated with work experience. In order to get rid of the effects of work experience I do the following. First, I estimate 2 for males born in years from 1960 to 1970 and interview in rounds 9 and 10 (these are mainly the males of ages between 30 and 40). I use the obtained estimates in order to remove the effects of experience on wage by defining a modified wage variable:

$$\log(1+\text{wage}^m_{it}) = \log(1+\text{wage}_{it}) - \hat{\beta}_2 \text{experi}_{it}.$$

Then I estimate the following model

$$\log(1+\text{wage}^m_{it}) = \beta_0 + \beta_1 \mathrm{I}(\text{Served in army})_{it} + \beta_2 \mathrm{I}(\text{Live in city})_{it} + \beta_3 \text{evalhl}_{it} + \beta_4 \mathrm{I}(\text{Have college degree})_{it} + \beta_5 \mathrm{I}(\text{Was born in city})_{it} + \sum_t \delta_t \mathrm{I}(\text{round}_{it} = t) + u_{it}$$

for the males born in years from 1971 to 1985[6] and interviewed in rounds 19 and 20. These are the males of approximately the same age as the males for whom I estimated 2. Now I can use the year of birth as the instrument for I(Served in army) because I do not include experience in the right-hand side of the regression. The F-statistic from the first stage is 63.788 which is very high. The estimates are presented in table 9.

From the estimation we see that the military service leads to a decrease of wage by approximately 30% for males of age between 30 and 45. The sign of the estimate is consistent with all the results of the previous two sections and provides evidence in favor of negative effects of military service on wage. However there are certain drawbacks of this approach. One of them is the assumption that the effect of experience on wage is the same for the males born between 1960 and 1970 and for males born between 1971 and 1985. Another possible objection against this regression is the nature of the decrease of the probability of being drafted. This probability started to decrease for males who were born in 1971. These are males who if had done military service start it somewhere in early 1990s. There was no legal reason for the decrease of the number of draftees which means that this decrease cannot be treated as natural experiment. More careful IV estimation strategy is the topic of further research.

7 Conclusions

In this paper I provided some evidence in favor of the existence of negative effects of military service on income and in particular wage. First, using OLS regressions I have shown that there is no statically significant relation between income and doing military service in the whole population. The only subpopulation in which there is statistically significant relation is that of the males who were born in city and who have college degree. For this subpopulation the income and veteran status are negatively correlated.

[6]this year seems to be the last year of dramatic decrease of the probability of being drafted (see figure 2).

Table 9: IV estimation of the effects of military service.

VARIABLES	
I(Served in army)	-0.296*
	(0.156)
I(Live in city)	0.158***
	(0.0562)
Health self-evaluation	-0.0989***
	(0.0329)
I(Have college degree)	0.229***
	(0.0639)
I(Was born in city)	0.104*
	(0.0538)
Constant	8.476***
	(0.147)
Observations	1,833
Number of persons	1251
First stage F-stat.	63.788

Standard errors adjusted for clusters formed by individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

OLS regressions do not allow me to conclude that there is a negative effect of military service on income because of self-selection. In order to reveal the effect of military service I tried to use instrumental variables approach. This allowed to provide some evidence in favor of negative influence of military service on wages. However the approach I used has certain drawbacks and more accurate estimation strategy is one of the topics of further research.

The law approved by the State Duma in 2006 about the changes of the term of compulsory military service provided me with unique opportunity to estimate the short-run effect of the second year of military service on wage. Using this law I managed to apply difference in difference approach to show that the second year of military has negative effect on wages at least for young people. This effect is greater than the effect of loosing a year of civilian work experience. In my case the negative effect of the second year of military service is approximately 2.5 times as large as the effect of the loss of a year of civilian work experience.

8 Appendix – income and wage correction

In order to correct wages and income for inflation I need average prices for years 1991-2011. For this I used data on consumer price index (CPI) for years 1992-2011 and the prices of a fixed bundle of consumer goods and services in 2011. The description of CPI implies the following formula for it:

$$CPT_t = \frac{P_t}{P_{t-1}}.$$

Therefore I use the following iteration scheme:

$$\begin{cases} P_{t-1} & = \dfrac{P_t}{CPI_t},\ t = \overline{1992, 2011} \\ P_{2011} & \text{given.} \end{cases}$$

This scheme allows to obtain prices for years 1991-2011. The resulting prices are ones of a fixed bundle of consumer goods and services.

There were some issues with regions matching. RLMS uses old list of regions. During 2000s several changes were made in administrative division of Russian Federation. The table 10 shows which administrative units were merged. Starting from 2001 the CPI is given only for new administrative units (column 3). In all these cases I used CPI for these new administrative units for the old ones presented in RLMS classification.

Table 10: Administrative changes in 2000s.

Date	Merged AU[a]	Resulting AU
1 December 2005	Permskaya oblast, Komi-Permyatskiy AD[b]	Permskiy kray
1 January 2007	Krasnoyarskiy kray, Taymirskiy AD, Evenkiyskiy AD	Krasnoyarskiy kray
1 March 2007	Kamchatskiy oblast, Koryakskiy AD	Kamchatskiy kray
1 January 2008	Irkutskaya oblast, Ust-Ordinskiy Buryatskiy AD	Irkutskaya oblast
1 March 2008	Chitinskaya oblast, Aginskiy Buryatskiy AD	Zabaykalskiy kray

[a] administrative unit(s).
[b] autonomous district.

The income correction was done as follows. Let τ be a base year. Then for each region r and for each year t the corrected income was defined as

$$CorrectedIncome_{rt} = Income_{rt} \frac{P_{r\tau}}{P_{rt}}.$$

The wage data was corrected in the same manner.

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