

**RETURNS TO SCHOOLING UNDER FOREIGN VERSUS DOMESTIC
OWNERSHIP IN RUSSIA, 2003-2010**

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Abstract

In this study I investigate the returns to schooling in Russia 2003-10. I start with the replication of the paper by Gorodnichenko and Sabirianova (2005) by using the same data set, methodology and definition of variables. My findings show that the returns to schooling are very similar to the estimates in the original paper. They are fluctuating between 8 and 9 percent. Then I use actual years of schooling instead of imputed which decreased the bias in estimates due to lower measurement error. The new estimates for the returns to schooling became 2 percent lower. I extend my research to the investigation of the effect of privatization on the returns to schooling and I find negative effect on the returns to schooling in private companies. In contrast, I found positive correlation between the returns to schooling and foreign ownership but the coefficients are insignificant in the whole investigated period due to small number of observations.

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INTRODUCTION

Since the beginning of the transition process in all of the post-communist countries policy-makers argue about possible positive or negative effects of privatization on both workers and firms' efficiency. The firm's efficiency is a responsibility of a new private owner and it is in his/her interest to increase the efficiency and get higher profits. But firm's productivity is closely related to the workers' well-being at the company so the politicians are often afraid to give state-owned companies to private hands. The politicians and policy-makers are, first of all, afraid of possible employment cuts. They base their fears on a theory that improvement in productivity may lead to decrease in employment if constant output is assumed (Brown et al., 2010). But such negative effect on employment may be canceled out by scale effect if we assume that output grows. The increase in output may occur as a result of higher product demand or due to entering new markets. Moreover, simply if a state company which has been privatized has a good and effective organizational structure then there is no need for the new owner to change it and fire workers.

The possible change in wages on privatized company is also subject to discussion. As stated in Brown et al. (2010) the wages may decrease as a result of cost-reduction policy at the enterprise; or the wages may increase if the enterprise is efficient enough, or if it wants grow in scale and attract better workers with higher wages. So it seems logical to assume that highly educated and high-skilled workers would most probably be positively affected by the privatization.

In any case the Communist era is over and now-a-days we have a possibility to look back at the privatization process and make an empirical analysis of the effects of privatization on both workers and firms' productivity. Most of the empirical

labor economic literature describes positive effects of privatization on firms' efficiency. For example, a study by Megginson and Netter (2001 cited Brown et al. 2010) suggests that firms became more productive after being privatized. Brown et al (2006) found that privatization had positive effect on firms' productivity in Hungary, Romania and Ukraine, although they found small negative effect for Russia.

But if the effect of privatization on firms' productivity has been studied quite a lot in the labor economic literature, the effect on the workers has not been studied that much thoroughly. One of the recent studies by Brown et al. (2010) showed that domestic privatization had negative effect on employment in Hungary and Ukraine but positive effect in Russia and Romania. Wages were negatively affected in all four countries but the estimates were small in magnitude (2-4% reduction in wages). The foreign privatization in the same study had positive effects on both employment and wages in all four countries. The other research by Melly and Puhani (2008) shows positive effect of privatization on workers' wages within telecommunications and railway industries. Monteiro, Natalia (2004) also found positive effect of privatization on wages in banking industry of Portugal in 1989-1997.

The effects of privatization on employment and wages received quite a lot of attention in the past research. But what can we infer about the effect of privatization on the returns to schooling? Would years spent in school pay back more during the transition process than during the Communism? Such a question was not investigated enough in the literature. Most of the studies which investigated the returns to schooling in pre-reform and early ages of post-reform periods did not look separately at the returns to schooling on state, private, and foreign companies.

One of the studies which did look at the returns to schooling on state and privatized companies was made by Haizheng (2003) who showed that the returns to

schooling in China in 1995 were notably higher than in 1980s. The author emphasized that one of the reasons for such improvement was due to expanding private ownership in the process of transition in China. But there was also another study by Brown et al. (2006) who showed the opposite effect of privatization on the returns to schooling. The authors found small but negative effect on the returns to schooling in Ukraine in 2003.

The other researches on the returns to schooling did not distinguish between different returns to schooling on state, private and foreign companies. They concentrated mainly on the dynamics of average returns to schooling in a given country as the time spanned from planned economy to the market economy. All of the studies were based on a hypothesis that “in the absence of the wage-grid structure ... returns to schooling would increase” (Fleisher et al., 2004). Such a hypothesis found its proof in the empirical research. The full summary of the returns to schooling for 10 transition countries is presented in the paper by Fleisher et al. (2004) which covers the time period from 1975 to 2002. For example, they report that the returns to schooling increased from 1.5 to 6.1 percent in China, from 3.8 to 9.7 percent in Slovakia, from 6.7 to 9.8 percent in Hungary etc.

One of the studies, which looks at the dynamics of the returns to schooling from 1985 to 2002 in Russia and Ukraine and which I replicate in my research, is a paper by Gorodnichenko and Sabirianova (2005). They showed that returns to schooling were very low in both countries before the reform (3-4%) with a considerably high increase in Russia in post-reform period (up to 9.7 percent) and a slight increase in Ukraine up to 4.5 percent. They conclude that such a divergence in the returns to schooling is due to differences in salaries.

In this paper I partially continue the research of Gorodnichenko and Sabirianova and investigate the returns to schooling in Russia in 2003-10. I base my research on the same theoretical model, the same data survey (RLMS) and the same definition of variables which gives me the possibility to compare the estimates and follow the dynamics of the returns to schooling in the recent times. Moreover, further in my research I use the possibility to use actual years of schooling for individuals instead of imputed as it was done in the original paper. Inclusion of this variable allows reducing the measurement error and gives more trustable results.

The results of the replication are very similar to the findings of Gorodnichenko and Sabirianova (2005). The returns to schooling are fluctuating between 8 and 9 percent. When the actual years of schooling is used instead of imputed the returns to schooling become 1.5-2 percentage points lower. This suggests that imputed years of education positively bias the results.

The special focus in this study is dedicated to the research of the returns to schooling on private and foreign companies. My findings for transitional Russia show that the coefficients for the returns to schooling on foreign companies are positive but insignificant. That would mean that on foreign companies the returns to schooling are the same as on the state companies. But in my opinion they are insignificant only because of small number of observations of individuals, who work in foreign companies, in the sample.

The results of the estimation of the returns to schooling on private companies are consistent with the findings of Brown et al. (2006). They found that privatized companies paid 1.1 percent lower wages than state enterprises. In my estimation the coefficients for the returns to schooling on private companies are negative and almost always significant. I find that the returns to schooling are 2-5 percent lower on

private companies than on state-owned companies. But the results are not totally comparable with the results of Brown et al. (2006) because in my research I did not distinguish between ever private and newly privatized so my estimates were affected by both types of private ownership.

The rest of this paper is divided into the following sections. In chapter 1, I summarize and replicate the results of Gorodnichenko and Sabirianova (2005). In chapter 2, I investigate the difference in the returns to schooling on private, foreign and state companies. In Chapter 3, I summarize the concluding remarks.

CHAPTER 1 – REPLICATION OF GORODNICHENKO AND SABIRIANOVA PAPER (2005)

In Chapter 1.1 I summarize the findings of the paper by Gorodnichenko and Sabirianova (2005) who investigated the returns to schooling in pre- and post-reform period in Russia and Ukraine. I continue their research for the returns to schooling in Russia in later time period. I describe the survey and give short statistical analysis of the data in Section 1.2. In Section 1.3 I explain the theoretical model and present the results.

1.1 Summary of the replicated paper and limitations to the replication

I replicated the part of a paper by Gorodnichenko and Sabirianova (2005) “Returns to Schooling in Russia and Ukraine: A Semiparametric Approach to cross-country comparative analysis”. In their paper the authors investigated the returns to schooling in Russia and Ukraine in the period of pre-collapse of the Soviet Union and in the early ages of independence. They used ULMS (1986-2002) and RLMS (1985-2002) data sets.

They found that the returns to schooling before 1991 were almost the same in both countries: 2.8% in Russia in 1985 and 3.4% in Ukraine in 1986. But already in the first years of transition the returns to schooling in Russia substantially increased (8.1% in 1996 and 9.2% in 2002) in comparison with Ukraine (3.7% in 1997 and 4.5% in 2002). After adding more controls to the regression, the coefficients on the returns to schooling almost did not change which testifies their robustness. Then the authors employed the decomposition techniques to analyze the difference in the returns to schooling. They argued that the higher price levels (salaries) played a key role in explaining the higher returns to education in Russia.

Their findings are similar to the estimation of the returns to schooling in transition economies. Thus, Munich et al. (2005, p. 108) find that in the Czech Republic returns to education were 2.7% in 1989 and 5.8% in 1996. Junsen Zhang et al. (2005, p. 739) find that returns to schooling in urban China increased from

4,0% in 1988 to 10,2% in 2001. A similar result for China were estimated by Johnson and Chow (1997, p. 108). They found that the returns to education in 1988 were 4,02% in rural areas and 3,29% in urban areas. Also Devereux and Hart (2010) replicated a paper by Oreopoulos (2006) and after correcting for his mistakes in STATA code came to the conclusion that the returns to schooling in Britain were around 3% in 1984-1998.

So the authors showed that the returns to schooling in Russia increased substantially during the early stages of transition period. By the end of 1990s – beginning of 2000s the returns to schooling leveled off and even seemed to start decreasing in 2002. For the full list of the estimates from Gorodnichenko and Sabirianova's paper refer to tables A.5 in Appendices. But how the returns to schooling "behaved" after 2002? It is an empirical question and the answer to it is given further in this research.

1.2 Data description and definitions of variables

To explore the dynamics of the returns to schooling I use Russian Longitudinal Monitoring Survey (RLMS-HSE), which was also used in the paper of Gorodnichenko and Sabirianova. The RLMS is an annual household survey which contains such information as individuals' education and employment history, pensions, their health etc. Originally there were drawn 4718 dwellings across Russia in 1996, out of which 3973 dwellings responded. Those individuals who moved to different address from the original household, were included if it was possible to find them; and those new individuals who moved to the original household address, were added to the survey.

The organizers of the RLMS-HSE reported that the response rate in the first year of the panel survey (1996) was 84.3%, and since then was sloping downward. The individual response rate within each household was more than 97 percent in each year. I used data from 2003 to 2010 (last available year for public use). The number of non-missing observations varies from 2981 in 2003 to 5675 in 2010.

Naturally, the unresponsive rate can bias the results of the study if those individuals who did not reply to the survey were systematically different from those who replied. The short analysis, which was done by the organizers of the survey, showed that the response rate was the smallest in Moscow and Saint Petersburg, and thus the representativeness of urban areas decreased in absolute values. In 2002 the whole sample of individuals from Moscow and Saint Petersburg was 100 percent replaced by a new sample due to a low response rate in these cities. This replacement does not affect the comparison of my estimates for the 2003-2010 time period but the comparison with the estimates of Gorodnichenko and Sabirianova will be affected.

In the beginning of the replication part I define all of the variables as in the original paper to be able to compare the estimates and see their dynamics. Later on I take an advantage of possibility to use the actual years of schooling for each individual instead of imputed. In their paper, Gorodnichenko and Sabirianova had to redefine the available actual years of schooling into adjusted. It was done intentionally to increase the measurement error in the estimates for Russian data set to make the Russian estimates to be more comparable with Ukrainian estimates.

As in my research I do not need to compare estimates for Russia with estimates for Ukraine I take advantage of a possibility to include actual years of

schooling. Such variable contains lower measurement errors and thus provides more trusted results for the returns to schooling.

The full list of variables, their definitions and the short summary of statistics for the RLMS data (2003-2010) are available in Appendices, Table A.1 and A.2 (standard deviations are reported in parenthesis). As we can see from table A.2 the average wages in Russia increased from 4221 RUB (132.61 USD)¹ in 2003 to 14421 RUB (474.69 USD) in 2010. In the household survey the value of the wage variable was adjusted for inflation to June 1992 (beginning of the survey) by using the inflation index.

The average years of schooling were continuously increasing in each year with the biggest jump was from 2005 (11.7 years) to 2006 (11.9 years). Its changes are illustrated on Figure 1.1. This suggests that Russian population is more eager to receive education. This is probably because the demand for highly educated people is increasing as companies want to increase productivity.

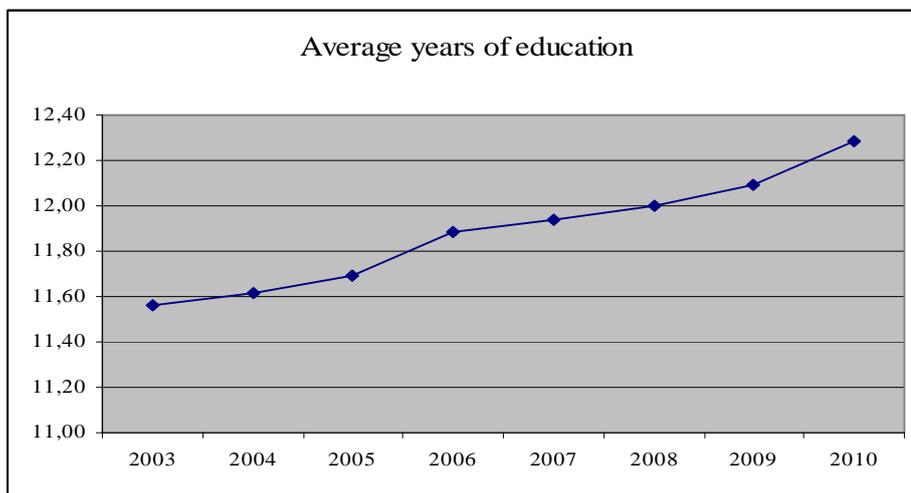


Figure 1.1 – Average years of education in Russia, 2003-2010

The average years of experience were fluctuating between 24 and 25.5 years. The average age of the respondents increased from 42.5 years in 2003 to 43.5 years

¹ The average exchange rate was 1USD=31.83RUB in 2003 and 1USD = 30.38RUB in 2010. Source: Russian portal, available at: <http://www.opoccuu.com/kurs.htm>

in 2010. The share of females was constant during 2003-2005 with a slight increase in the consequent years. The average number of hours per month raised by 5 hours from 2003 to 2007, then there was a slight decrease up to 2009 and in 2010 the number of hours per month started to increase again.

1.3 Empirical models and estimation results

To estimate the returns to schooling in Russia the authors employed a simple Mincerian model (2005, p. 333), which is specified in the equation (1).

$$\ln w_{it} = \beta_0 + \beta_1 sch_{it} + \beta_2 exp_{it} + \beta_3 exp_{it}^2 + \beta_4 female_{it} + \beta_5 capital_{it} + \varepsilon_{it} \quad (1)$$

where i - stands for individual, t – stands for time (2004), w_{it} - monthly wages after taxes, sch_{it} - actual years of schooling, exp_{it} - potential experience of individual, $female_{it}$ - dummy for individual's gender, $capital_{it}$ - dummy indicating whether individual lives in capital city or not, and ε_{it} - error term. The results of estimation by OLS are shown in 1.1 below. For the purpose of having better visual representation, the dynamics of the returns to schooling from equation (1) is illustrated on Figure 1.2. The estimates from 1985 to 2002 were taken from Gorodnichenko and Sabirianova's paper (2005, p.333). For the full list of estimates of equation (1) from Gorodnichenko and Sabirianova's paper refer to table A.5 in Appendices.

Table 1.1 – Estimation of the basic Mincerian earnings function

	2003	2004	2005	2006	2007	2008	2009	2010
Imputed years of schooling	0.150*** ² (0.016)	0.077*** (0.004)	0.094*** (0.009)	0.088*** (0.006)	0.071*** (0.004)	0.078*** (0.006)	0.081*** (0.007)	0.072*** (0.006)
Actual years of schooling	0.138*** (0.013)	0.064*** (0.004)	0.071*** (0.008)	0.072*** (0.005)	0.058*** (0.003)	0.064*** (0.005)	0.063*** (0.006)	0.060*** (0.005)

² * the variable is significant at 10% significance level, ** at 5% significance level, *** at 1% significance level

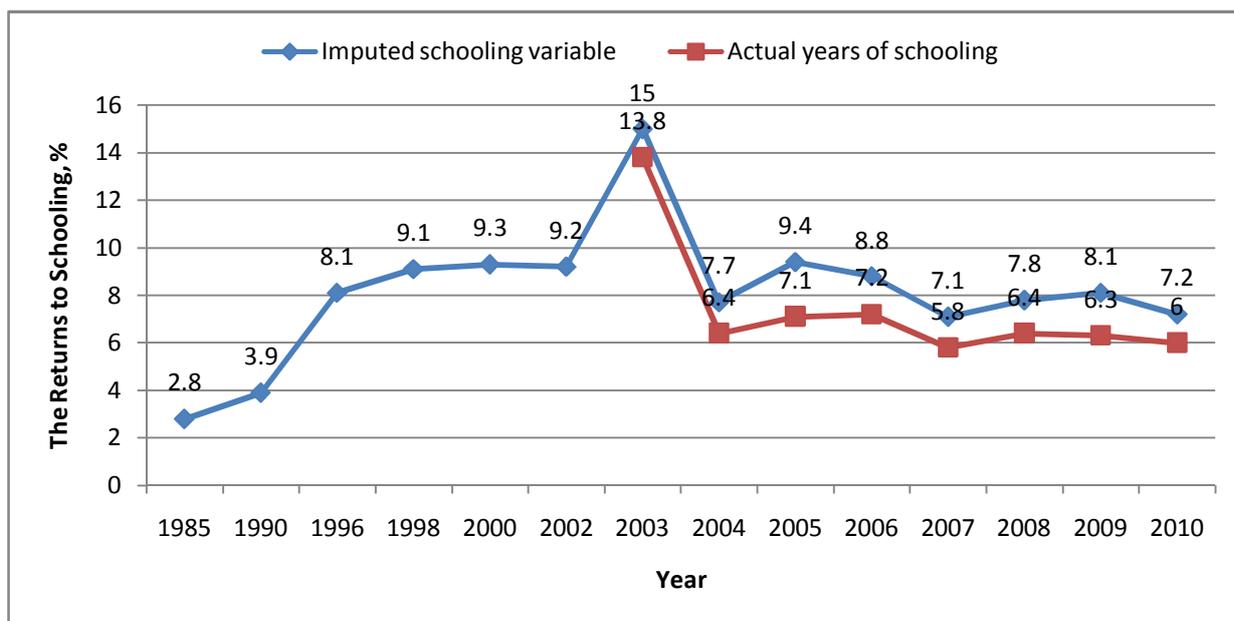


Figure 1.2 – Dynamics of the returns to schooling in Russia with imputed and actual years of schooling (data from 1985 to 2002 were taken from Gorodnichenko and Sabirianova, 2005, p.333)

The estimates for the schooling follow the upward trend from 1985 to 1998 and then level off during 1998-2002. In 2003 the estimate of the returns to schooling jumps very high – up to 15 percent (13.8 percent in other specification). It is more than 1.5 times higher than the estimate of Gorodnichenko and Sabirianova (2005, p.333) for 2002. There is no particular economic reason behind such a jump, and as it will be shown further, the jump disappears when more explanatory variables are included into regression.

To decrease bias in estimates and to investigate the Mincerian earnings function more thoroughly, the authors extended equation (1) with additional explanatory variables, which are correlated with the wages:

$$\begin{aligned}
 \ln w_{it} = & \beta_0 + \beta_1 sch_{it} + \beta_2 exp_{it} + \beta_3 (exp_{it})^2 + \beta_4 female_{it} + \beta_5 capital_{it} + \beta_6 ten_{it} + \\
 & + \beta_7 (ten_{it})^2 + \sum_{n=1}^q \alpha_k own_{n,it} + \beta_{11} state \times priv_{it} + \beta_{12} state \times foreign_{it} + \beta_{13} priv \times foreign_{it} + \\
 & + \beta_{14} state \times priv \times foreign_{it} + \beta_{15} OwnNo inf o_{it} + \sum_{m=1}^p \gamma_m size_{m,it} + \beta_i SizeNo inf o_{it} + \varepsilon_{it}
 \end{aligned} \quad (2)$$

where ten_{it} - years of tenure, $own_{n,it}$ - dummies for the ownership type (state, private or foreign), $size_{m,it}$ - dummies for the size of a firm (numbers of employees), $OwnNo\ inf\ o_{it}$ - dummy for no information on ownership type of a firm, $SizeNo\ inf\ o_{it}$ - dummy for no information on size of a firm.

The estimates for the returns to schooling with imputed and actual years of education are summarized in table 1.2 below. For the full list of estimates refer to Appendices, tables A.6 and A.7. The estimates from the first line are higher than estimates from the second line, which gives evidence that estimation with imputed years of schooling provides positively biased results. Including a variable for actual years of schooling instead of imputed decreases the measurement error and provides more trusted results.

Table 1.2 - Estimation of the extended Mincerian earnings function

	2003	2004	2005	2006	2007	2008	2009	2010
Imputed years of schooling	0.100*** (0.015)	0.081*** (0.005)	0.096*** (0.010)	0.095*** (0.006)	0.077*** (0.004)	0.090*** (0.006)	0.089*** (0.008)	0.077*** (0.006)
Actual years of schooling	0.081*** (0.013)	0.067*** (0.004)	0.075*** (0.008)	0.080*** (0.005)	0.064*** (0.003)	0.076*** (0.005)	0.070*** (0.007)	0.067*** (0.005)

For better visualization the dynamics of the returns to schooling from equation (2) is presented on figure 1.5 below. In general the returns to schooling follow a similar path as in the figure 1.2, except for 2003. In the figure 1.3 there is no sudden jump in the returns to schooling. This suggests that in 2003 omission of some explanatory variables positively biased the estimate for the returns to schooling very much. In general, for all of the years the equation (2) provides better results because it includes variables which are correlated with the wages, and their omission in equation (1) biased the estimates.

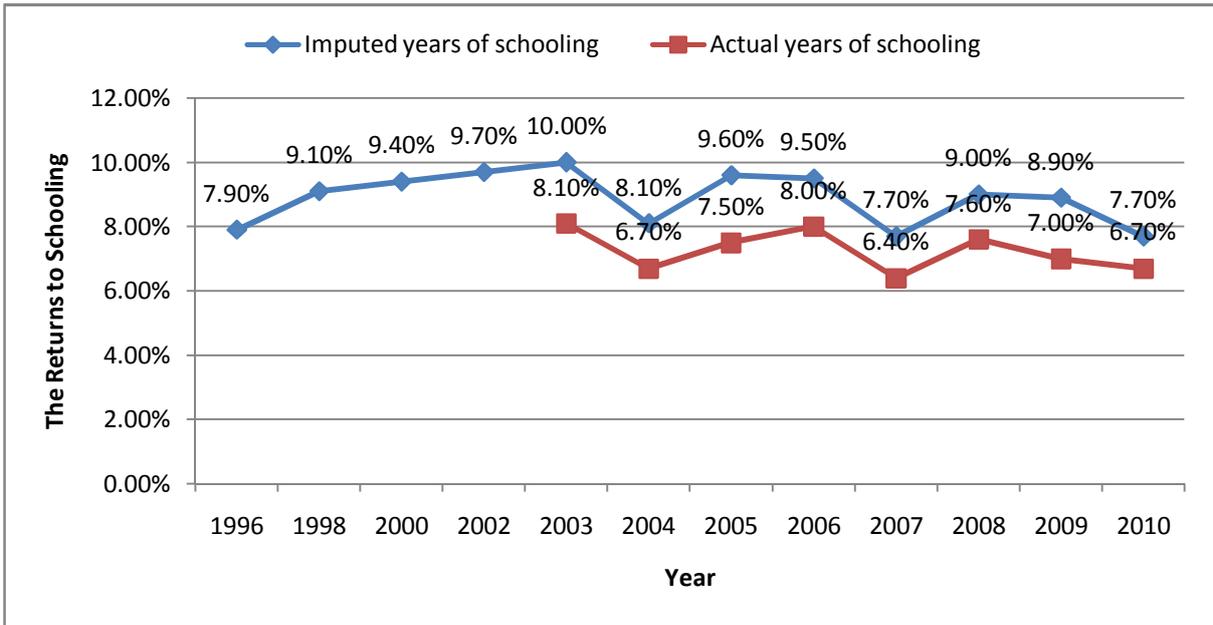


Figure 1.3 – Dynamics of the returns to schooling in Russia with imputed and actual years of schooling (data from 1985 to 2002 were taken from Gorodnichenko and Sabirianova, 2005, p.333)

The returns to schooling are cyclically fluctuating during the years of investigated period with the lowest returns in 2004, 2007 and 2010. The decrease in 2004 can be explained by high unemployment rate, which is illustrated in figure 1.4 below. When the unemployment rate is high in the country then employers can easier hire labor force and the salaries will be decreasing. So the returns to schooling will be also decreasing.

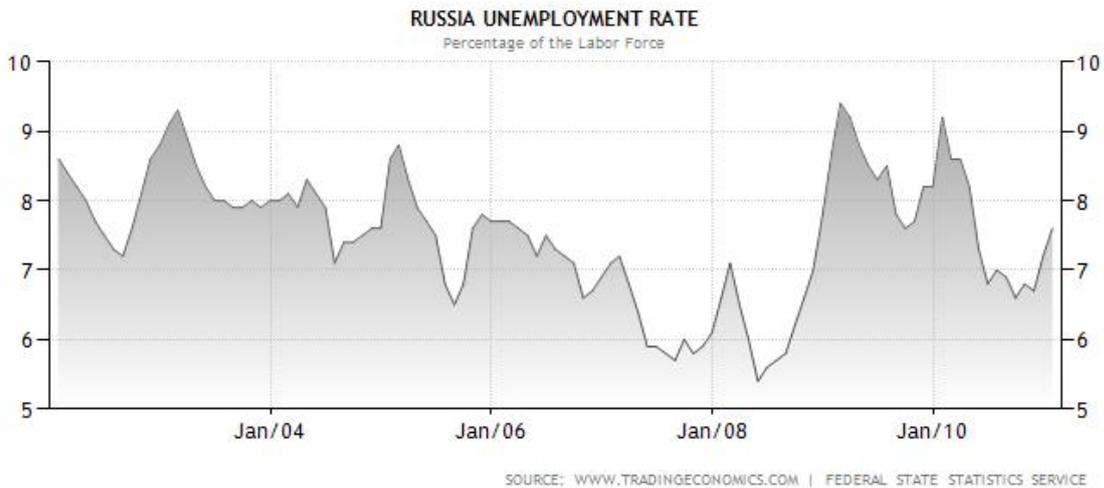


Figure 1.4 – The unemployment rate in Russia from Jan 2000 to Jan 2011 (source: Trading Economics)

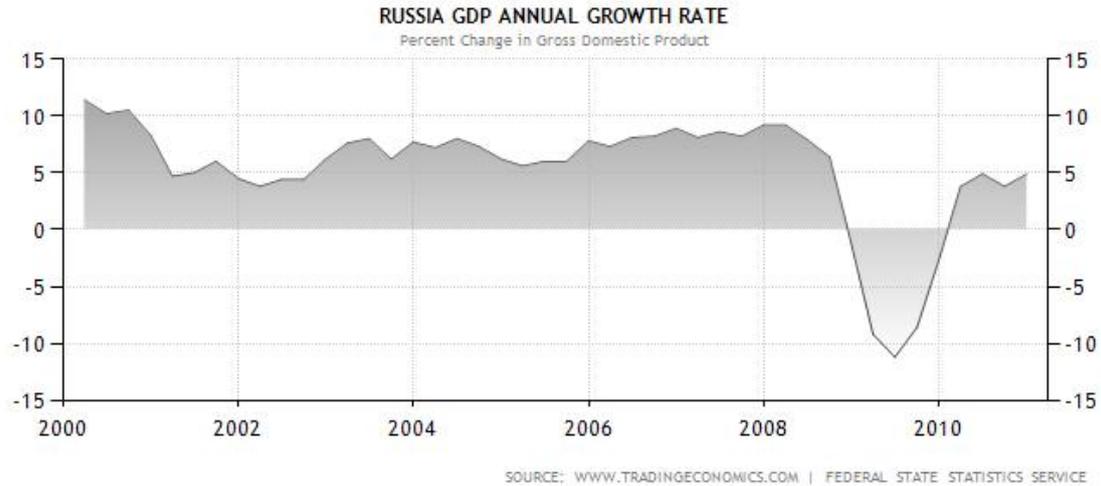


Figure 1.5 – The annual GDP growth rate in Russia, Jan 2000-Jan 2011 (source: Trading Economics)

The macroeconomic situation in Russia cannot explain the decrease in the returns to schooling in 2007. The growth rate of the GDP which is illustrated in Figure 1.5 was positive and the unemployment rate was relatively low in Russia. So there are no internal economic factors inside the country for the change in the returns to schooling. But from my point of view, the salaries, and thus the returns to schooling, could be affected by the economic crisis in the world in this year. The Russian state, private and foreign companies could decrease the salaries when they found out about the unstable economic situation in the world.

The decrease in 2009-2010 can be explained by the difficult macroeconomic situation in Russia. The Russian GDP growth rate was negative in 2009 and in the beginning of 2010 (figure 1.5). This could have a long term effect on the returns to schooling. The unemployment rate was also the highest in 2009 and in the beginning of 2010 (figure 1.4). The unemployment rate is directly connected to the returns to schooling. If the unemployment rate is high then it is easier for the employer to hire a worker, and it is also possible to pay lower wages. So the individuals with the same years of education are treated differently by the employer in economic boom and in the recession.

CHAPTER 2 – EFFECT OF PRIVATE AND FOREIGN OWNERSHIP ON THE RETURNS TO SCHOOLING

In Chapter 2.1 I elaborate on a new model for capturing the average returns to schooling. In particular, I allow the returns to schooling to differ among individuals with different years of experience. Moreover, I disaggregate the returns to schooling between different ownership types. This allows me to see the difference between the returns to schooling on state, private, and foreign enterprises. I present the results of estimation in Chapter 2.2.

2.1 Empirical model

Starting from the beginning of the transition period, when private ownership started to appear and foreign companies started to enter the Russian market, they attracted the most skilled workers by paying them high salaries. Obviously, demand for the highly educated people increased, so it would be logically if the returns to each additional year of schooling increased. Thus, Haizheng (2003) found that the returns to schooling increased in China in 1995 in comparison with the 1980s. He also found that private companies pay more to highly educated people and state companies reward more low educated people.

In contrast, Brown et al. (2006) found that privatization had small negative effect on the returns to schooling in Ukraine in 2003. So do private and multinational companies (MNC) have higher or lower returns to schooling? In order to answer this question I elaborated a model (equation 3) which captures the return for an additional year of studying on state, private and foreign companies.

$$\begin{aligned} \ln w_{it} = & \beta_0 + \beta_1 S_{it} + \beta_2 S_{it} X_{it} + \beta_3 S_{it} X_{it}^2 + \beta_4 X_{it} + \beta_5 X_{it}^2 + \beta_6 F_{it} + \beta_7 S_{it} \text{Private}_{it} + \\ & + \beta_8 S_{it} \text{Foreign}_{it} + \beta_9 \text{Capital}_{it} + \beta_{10} \text{Private}_{it} + \beta_{11} \text{Foreign}_{it} + \sum_{n=1}^3 \beta_n \text{Mix}_{n,it} + \beta_{15} \ln H_{it} + \quad (3) \\ & + \beta_{16} \text{ten}_{it} + \beta_{17} \text{ten}_{it}^2 + \beta_{18} \text{Married}_{it} + \beta_{19} \text{Size}_{it} + \beta_{20} \text{MissSize}_{it} + \beta_{21} \text{MissOwn}_{it} + u_{it} \end{aligned}$$

where i - stands for individual, t – stands for time (2003-2010), w_{it} - monthly wages after taxes, S_{it} - actual years of schooling, X_{it} - potential experience of

individual, F_{it} - dummy which equals to one if an individual is female, $Capital_{it}$ - dummy indicating whether individual lives in Moscow or not, $Private_{it}$ - dummy for privately owned enterprises, $Foreign_{it}$ - dummy for foreign owned enterprises, Mix_{it} - dummy for mixed ownership, $OwnNo\ inf\ o_{it}$ - dummy for no information on ownership type of a firm, ten_{it} - years of tenure, $Married_{it}$ - dummy for marital status, H_{it} - average number of hours per month, $Size_{s,it}$ - continuous variable for the size of a firm (numbers of employees), $SizeNo\ inf\ o_{it}$ - dummy for no information on size of a firm, u_{it} - an error term.

The functional form of schooling differs from the equation (1) and (2). In equation (3) the schooling variable is interacted with the experience and experience squared which allows for variation in the returns to schooling due to individuals' experience. It was also shown in Andren et al. (2004, p.32), that the returns to schooling were different for individuals with different years of experience. In particular, the returns to schooling had a concave form. This means that fresh graduates have lower returns to schooling than those with 10 or 15 years of experience.

The coefficients of interest are β_7 and β_8 , where schooling variable is interacted with a dummy of private and foreign ownership. These coefficients will show how much more or less private and foreign companies pay to their employees in comparison to state companies.

The returns to schooling are a complex function of individual's years of experience and type of ownership of a company in which s/he works. β_1 from equation (3) represents the average returns to education in state companies. The returns to schooling in private companies are a sum of β_1 and β_7 if an individual has

zero years of labor market experience. If s/he has some working experience then we should also add β_2 and β_3 multiplied with the number of years of working experience. The returns to schooling in foreign companies for individuals with zero years of experience is a sum of β_1 and β_8 .

2.2 Results

The results of the estimation of the equation (3) are partially presented in Table 2.1 below. For the full list of the estimates refer to Table A.8 in Appendices. Dynamics of the returns to schooling on state, private and foreign companies for individuals with zero years of experience is presented on figure 2.1. Blue line on the graph represents the returns to schooling in state firms, green line - the returns to schooling in foreign firms, and red line - the returns to schooling in private firms. The returns to schooling for individuals with 5, 10 and 20 years of labor market experience have the same dynamics but higher in magnitude. The dynamics is presented on Figures A.1, A.2 and A.3 in Appendices.

Table 2.1 - Estimation of the returns to schooling in Russia on private and foreign enterprises (equation 3)

	2003	2004	2005	2006	2007	2008	2009	2010
School, β_1	0.074** (0.037)	0.070*** (0.012)	0.109*** (0.024)	0.082*** (0.013)	0.082*** (0.010)	0.081*** (0.014)	0.083*** (0.020)	0.069*** (0.015)
School* Exper, β_2	0.006* (0.003)	0.002** (0.001)	0.000 (0.002)	0.002** (0.001)	0.002* (0.001)	0.002 (0.001)	0.002 (0.002)	0.003** (0.001)
School* Exper ² * 1000, β_3	-0.115* (0.062)	-0.050*** (0.018)	-0.031 (0.040)	-0.060*** (0.022)	-0.055*** (0.019)	-0.053** (0.024)	-0.064** (0.031)	-0.079*** (0.025)
School* Private, β_7	-0.049** (0.027)	-0.013 (0.008)	-0.006 (0.017)	-0.009 (0.009)	-0.021*** (0.007)	-0.007 (0.010)	-0.032** (0.013)	-0.023** (0.010)
School* Foreign, β_8	-0.039 (0.068)	-0.023 (0.022)	0.035 (0.052)	0.009 (0.023)	0.014 (0.020)	0.006 (0.026)	0.014 (0.035)	0.027 (0.029)

The returns to schooling for individuals with 0 years of experience

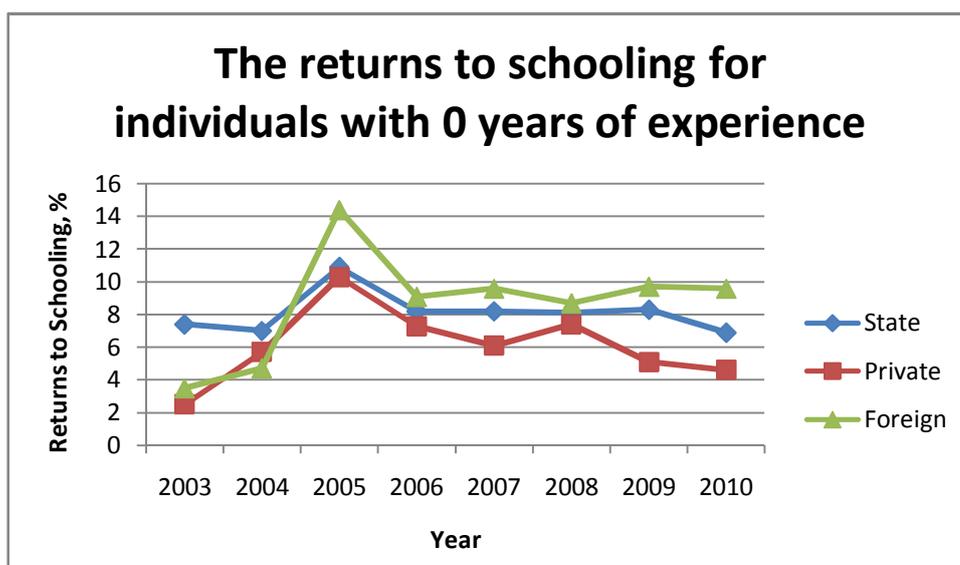


Figure 2.1 – The returns to schooling for individuals with zero years of labor market experience

The figure clearly implies that starting from 2005 foreign companies pay more for one additional year of schooling than state companies. In contrast, Russian companies with private ownership pay less than state-owned enterprises during the whole investigated period. The coefficients for returns to schooling in foreign companies are not significant but this is due to a small number of observations. In the samples there are on average 300 individuals who work for foreign companies and around 2-3 thousand individuals who work in private companies and also around 2-3 thousand of people work in state companies.

The coefficients for the returns to schooling in private companies are negative and small in absolute values. They are significant in 2003, 2007, 2009 and 2010 on 5 percent significance level. This means that in Russia there is a tendency that private companies pay less than state companies for each additional year of schooling. This is not surprising if we think of big and profitable gas- and oil producing companies in Russia, which have state ownership. Not many private companies will be able to compete in terms of salaries with such state-owned giants.

My findings are consistent with the findings of Brown et al. (2006), where they showed a negative effect of privatization on the returns to schooling in Ukraine in 2003. They found that privatized companies pay 1.1 percent lower wages than state enterprises. In my estimation of equation (3), private companies pay on average 2-5 percent less than state-owned enterprises. But the results are not totally comparable with the results of Brown et al. (2006) because in their research they included only those companies which were privatized after 1991 and excluded those companies which were established as private from the beginning. So they could capture the “true” effect of privatization on the returns to schooling.

In the RLMS it is also possible to distinguish between privatized and newly private companies by constructing a panel data and following the individual’s employment history and tenure. Such distinction between privatized and newly private companies is out of the scope of this paper but the further research would be needed to show the effect of privatized ownership on the returns to schooling.

CONCLUSION

The change in the political system is a big shock for a country and the biggest fears of the people arise from uncertainty in the future. But whether these fears have a reasonable justification or not is an empirical question. By using data from a Russian Longitudinal Monitoring Survey I investigated the returns to schooling in Russia in 2003-2010. I started with a continuation of the research of Gorodnichenko and Sabirianova (2005) of the returns to schooling in Russia by using the most recently available data.

First of all, I defined all of the variables as in the original paper to follow the changes in the returns to schooling. The results show that the returns to schooling in the recent past are very similar to the estimates of Gorodnichenko and Sabirianova for the beginning of transition period: around 8-9 percent. Then I redefined the schooling variable into actual years of education instead of imputed. It helped to decrease the bias in estimates which resulted in lower estimates for the returns to schooling.

Moving further in my research I investigated the difference in the returns to schooling on private, foreign and state companies. I found positive but insignificant effect of foreign ownership on the returns to schooling but, in my opinion, the coefficients are insignificant only because of relatively small number of individuals in the sample who work in foreign firms.

For private ownership I found negative effect on the returns to schooling. My findings are consistent with the findings of Brown et al. (2006), where they showed that privatized companies pay 1.1 percent lower wages than state enterprises. In my estimation private companies pay on average 2-5 percent lower wages than state-owned enterprises.

It is not surprising that such a finding for Russia is consistent with the findings for Ukraine because Russia and Ukraine had a long history of common development and also the same system of communist ruling. Both countries are still in the beginning of the transition period so such a type as private ownership has to develop much more. Moreover, private and foreign companies take advantage of the possibility to pay wages at the same level with the state companies with the purpose of economizing.

But the results of the two studies are not totally comparable with each other because in their paper Brown et al. (2006) used a possibility to distinguish between ever private companies and newly privatized. In this research I did not separate ever private companies from privatized due to time and space limitations. But the further research on this issue would be needed to investigate the effects of privatization on the returns to schooling in Russia.

Appendices

Table A.1 - Definitions and sources of main variables (Gorodnichenko and Sabirianova, 2005, p.347-348)

Variable	Russia
Wage	Average monthly wage after taxes at the primary job, regardless of whether it was paid on time or not. All wages are converted into roubles
Actual years of schooling	Total number of years in a school including professional courses, vocational trainings, colleges and universities
Imputed years of schooling	The variable for actual years of schooling was converted into imputed years of schooling to have consistency with Gorodnichenko and Sabirianova's estimation. 4 years was imputed for 1-6 grades, 8 for 7-9 grades, 10 for 10-12 grades, 9 for vocational schooling without secondary school diploma, 11.5 for vocation school with secondary school diploma, 13 for technical college or incomplete higher education, 15 for specialist diploma (education system of post-soviet countries), and 18 for PhD.
Potential labor market experience	Age minus years of schooling minus 6
Tenure	Number of years since an individual started the primary job
Foreign	= 1 if a company is owned or co-owned by foreign firms or foreign individuals
Private	= 1 if a company is owned or co-owned by Russian private firms or Russian individuals; or if an individual is self-employed
State	= 1 if a company is owned or co-owned by state

Table A.2 - Descriptive statistics for RLMS, 2003-2010

Variables	2003	2004	2005	2006	2007	2008	2009	2010
Wage, RUB	4221 (3905)	5291.5 (4843)	6342 (5572)	7907 (6428)	9599 (6957)	12536 (10450)	12984 (10153)	14421 (12098)
Log(wage)	7.131 (2.671)	8.284 (0.774)	9.903 (1.422)	8.670 (0.972)	8.942 (0.686)	9.140 (0.975)	9.139 (1.219)	9.257 (1.164)
Schooling	11.558 (3.498)	11.616 (3.41)	11.693 (3.432)	11.882 (3.425)	11.94 (18.63)	12.002 (3.426)	12.092 (3.358)	12.281 (3.336)
School* Private	5.760 (6.621)	6.250 (6.623)	6.347 (6.65)	6.414 (6.747)	6.904 (6.744)	7.048 (6.749)	7.284 (6.777)	7.137 (6.928)
School* Foreign	0.519 (2.617)	0.512 (2.582)	0.521 (2.636)	0.542 (2.729)	0.474 (2.550)	0.469 (2.551)	0.515 (2.67)	0.461 (2.534)
Age	42.563 (18.87)	42.2 (18.8)	42.557 (18.80)	42.771 (18.73)	42.968 (18.63)	43.310 (18.67)	43.519 (18.67)	43.511 (18.40)
Female	0.570 (0.495)	0.570 (0.495)	0.570 (0.495)	0.572 (0.495)	0.573 (0.495)	0.579 (0.494)	0.578 (0.494)	0.575 (0.494)
Tenure	6.996 (8.982)	6.815 (3.139)	7.047 (8.961)	7.002 (8.974)	6.869 (8.804)	7.052 (8.800)	6.970 (8.692)	7.219 (8.759)
Tenure2	129.59 (287.2)	56.3 (41.11)	129.93 (293.2)	129.49 (295.2)	124.69 (288.1)	127.15 (290.8)	124.12 (286.4)	128.84 (287.0)
Experience	25.022 (20.01)	24.136 (19.4)	24.881 (19.88)	24.906 (19.77)	25.044 (19.62)	25.324 (19.69)	25.440 (19.63)	25.245 (19.34)
Exper2	1026.5 (1304)	958.83 (1227)	1014.2 (1289)	1011.0 (1275)	1012.2 (1262)	1029 (1272)	1032.4 (1269)	1011.3 (1241)
School*Exp	260.51 (201.6)	256.84 (202.7)	263.82 (204.6)	269.59 (207.7)	273.76 (208.7)	278.22 (210.8)	283.25 (212.4)	286.44 (212.3)
School*Exp 2	9566.9 (10889)	9227.6 (10750)	9707.2 (11088)	9951.9 (11301)	10131 (11400)	10375 (11633)	10612 (11850)	10638 (11828)
Moscow and S.Peterbrug	0.135 (0.342)	0.141 (0.348)	0.108 (0.310)	0.120 (0.325)	0.116 (0.320)	0.115 (0.319)	0.115 (0.319)	0.102 (0.302)
private owner	0.204 (0.403)	0.219 (0.413)	0.235 (0.424)	0.238 (0.426)	0.254 (0.436)	0.273 (0.445)	0.275 (0.446)	0.271 (0.444)
foreign owner	0.018 (0.133)	0.018 (0.131)	0.018 (0.134)	0.021 (0.142)	0.017 (0.129)	0.017 (0.129)	0.018 (0.135)	0.017 (0.129)
state owner	0.284 (0.451)	0.272 (0.445)	0.260 (0.439)	0.263 (0.440)	0.264 (0.441)	0.257 (0.437)	0.246 (0.209)	0.247 (0.431)
private x foreign	0.013 (0.113)	0.012 (0.111)	0.012 (0.111)	0.012 (0.109)	0.010 (0.099)	0.010 (0.098)	0.011 (0.105)	0.011 (0.104)
state x foreign	0.005 (0.072)	0.005 (0.069)	0.004 (0.064)	0.005 (0.071)	0.003 (0.057)	0.004 (0.059)	0.003 (0.054)	0.003 (0.054)
state x private	0.047 (0.211)	0.048 (0.214)	0.045 (0.206)	0.041 (0.199)	0.045 (0.207)	0.038 (0.190)	0.038 (0.191)	0.034 (0.182)
state x private x foreign	0.004 (0.063)	0.004 (0.062)	0.003 (0.054)	0.003 (0.055)	0.002 (0.048)	0.003 (0.050)	0.002 (0.044)	0.002 (0.048)
Ownership is missing	0.555 (0.497)	0.526 (0.499)	0.570 (0.495)	0.564 (0.496)	0.546 (0.498)	0.502 (0.500)	0.511 (0.500)	0.536 (0.499)

Table A.2 - Descriptive statistics for RLMS, 2003-2010 (continuation)

Size	796.89 (3591)	862.17 (3730.4)	876.51 (4218)	3792.1 (5959)	686.86 (3205)	580.94 (2673)	584.44 (3718)	784.54 (8942)
size, 1-9	0.041 (0.199)	0.039 (0.194)	0.699 (0.459)	0.033 (0.178)	0.043 (0.204)	0.046 (0.209)	0.049 (0.215)	0.053 (0.224)
size, 10-49	0.100 (0.299)	0.105 (0.306)	0.102 (0.303)	0.106 (0.307)	0.110 (0.313)	0.119 (0.324)	0.118 (0.323)	0.123 (0.328)
size, 50-99	0.047 (0.211)	0.044 (0.204)	0.043 (0.202)	0.047 (0.211)	0.045 (0.208)	0.057 (0.233)	0.051 (0.220)	0.053 (0.224)
size, 100-499	0.087 (0.282)	0.088 (0.283)	0.089 (0.284)	0.079 (0.27)	0.080 (0.272)	0.100 (0.300)	0.084 (0.277)	0.085 (0.279)
size, 500-999	0.024 (0.154)	0.026 (0.159)	0.023 (0.151)	0.025 (0.157)	0.021 (0.143)	0.030 (0.169)	0.025 (0.155)	0.022 (0.148)
size, >1000	0.689 (0.463)	0.051 (0.220)	0.035 (0.183)	0.702 (0.457)	0.692 (0.462)	0.637 (0.481)	0.664 (0.472)	0.655 (0.475)
Size is missing	0.651 (0.477)	0.647 (0.478)	0.656 (0.475)	0.514 (0.5)	0.660 (0.474)	0.601 (0.490)	0.637 (0.481)	0.620 (0.485)
Married	0.597 (0.491)	0.59 (0.491)	0.591 (0.492)	0.588 (0.492)	0.596 (0.491)	0.593 (0.491)	0.491 (0.500)	0.509 (0.500)
Hours	255.86 (67.92)	257.46 (66.28)	259.44 (65.90)	260.07 (67.93)	261.12 (64.40)	260.47 (67.52)	259.02 (68.42)	260.23 (65.91)
ln hours	5.506 (0.292)	5.337 (0.292)	5.524 (0.273)	5.524 (0.284)	5.533 (0.262)	5.526 (0.288)	5.518 (0.295)	5.526 (0.290)

Table A.3 – Estimation of the basic Mincerian earnings function (imputed schooling)

	2003	2004	2005	2006	2007	2008	2009	2010
C	4.721*** ³ (0.209)	7.443*** (0.061)	6.992*** (0.126)	7.645*** (0.077)	8.205*** (0.052)	8.234*** (0.078)	8.073*** (0.103)	8.337*** (0.082)
School	0.150*** (0.016)	0.077*** (0.004)	0.094*** (0.009)	0.088*** (0.006)	0.071*** (0.004)	0.078*** (0.006)	0.081*** (0.007)	0.072*** (0.006)
Exper	0.129*** (0.007)	0.015*** (0.003)	0.044*** (0.005)	0.023*** (0.003)	0.014*** (0.002)	0.024*** (0.003)	0.034*** (0.004)	0.030*** (0.003)
Exper ² *1000	-2.981*** (0.144)	-0.456*** (0.057)	-0.855*** (0.110)	-0.570*** (0.065)	-0.446*** (0.045)	-0.596*** (0.064)	-0.703*** (0.082)	-0.644*** (0.067)
Female	-0.661*** (0.071)	-0.493*** (0.020)	-0.583*** (0.040)	-0.518*** (0.024)	-0.425*** (0.016)	-0.516*** (0.024)	-0.552*** (0.031)	-0.525*** (0.024)
Capital	0.788*** (0.099)	0.647*** (0.027)	0.551*** (0.056)	0.594*** (0.035)	0.589*** (0.024)	0.645*** (0.035)	0.602*** (0.046)	0.588*** (0.038)
N	4933	5977	5634	6771	6676	5785	5695	8568
R	0.149	0.254	0.089	0.157	0.246	0.157	0.104	0.096

Table A.4 – Estimation of the basic Mincerian earnings function (actual years of schooling)

	2003	2004	2005	2006	2007	2008	2009	2010
C	4.698*** (0.194)	7.525*** (0.057)	7.152*** (0.120)	7.723*** (0.072)	8.261*** (0.049)	8.309*** (0.072)	8.196*** (0.097)	8.382*** (0.076)
School	0.138*** (0.013)	0.064*** (0.004)	0.071*** (0.008)	0.072*** (0.005)	0.058*** (0.003)	0.064*** (0.005)	0.063*** (0.006)	0.060*** (0.005)
Exper	0.134*** (0.007)	0.019*** (0.003)	0.049*** (0.005)	0.028*** (0.003)	0.018*** (0.002)	0.028*** (0.003)	0.038*** (0.004)	0.034*** (0.003)
Exper ² *1000	-3.046*** (0.0001)	-0.516*** (6*E-05)	-0.942*** (0.0001)	-0.640*** (6.5E-05)	-0.507*** (4.5E-05)	-0.642*** (6.3E-05)	-0.751*** (8.2E-05)	-0.700*** (6.7E-05)
Female	-0.643*** (0.071)	-0.484*** (0.020)	-0.567*** (0.040)	-0.505*** (0.024)	-0.418*** (0.016)	-0.510*** (0.024)	-0.546*** (0.031)	-0.523*** (0.024)
Capital	0.761*** (0.099)	0.642*** (0.027)	0.551*** (0.056)	0.585*** (0.035)	0.581*** (0.024)	0.644*** (0.035)	0.604*** (0.046)	0.587*** (0.038)
N	4933	4693	4703	5719	5625	5791	5696	8568
R ²	0.153	0.253	0.086	0.158	0.247	0.159	0.102	0.097

¹ * the variable is significant at 10% significance level, ** at 5% significance level, *** at 1% significance level

Table A.5 – Estimation of basic Mincerian earnings functions, OLS (Gorodnichenko and Sabirianova, 2005, p.333)

	1985	1990	1996	1998	2000	2002
Schooling (adjusted years)	0.028*** (0.003)	0.039*** (0.004)	0.081*** (0.007)	0.091*** (0.006)	0.093*** (0.007)	0.092*** (0.006)
Experience (years)	0.019*** (0.003)	0.027*** (0.003)	0.014*** (0.005)	0.029*** (0.005)	0.045*** (0.005)	0.030*** (0.005)
Experience ² /1000	-0.378*** (0.055)	-0.554*** (0.072)	-0.335*** (0.119)	-0.629*** (0.108)	-0.991*** (0.129)	-0.724*** (0.119)
Female	-0.424*** (0.016)	-0.401*** (0.020)	-0.473*** (0.030)	-0.530*** (0.027)	-0.520*** (0.030)	-0.473*** (0.026)
Capital	0.011 (0.044)	0.095 (0.058)	0.614*** (0.060)	0.537*** (0.061)	0.634*** (0.082)	0.630*** (0.053)
<i>N</i>	4111	3776	3497	3332	3169	3341
<i>R</i> ²	0.19	0.15	0.13	0.17	0.15	0.18

Table A.6 - Estimation of the extended Mincerian earnings function (imputed years of schooling)

	2003	2004	2005	2006	2007	2008	2009	2010
C	6.075*** (0.233)	7.111*** (0.083)	6.819*** (0.151)	7.159*** (0.094)	7.746*** (0.061)	7.782*** (0.094)	7.692*** (0.127)	8.035*** (0.100)
School	0.100*** (0.015)	0.081*** (0.005)	0.096*** (0.010)	0.095*** (0.006)	0.077*** (0.004)	0.090*** (0.006)	0.089*** (0.008)	0.077*** (0.006)
Exper	0.020* (0.011)	0.015*** (0.003)	0.036*** (0.007)	0.023*** (0.004)	0.015*** (0.003)	0.031*** (0.004)	0.039*** (0.005)	0.035*** (0.004)
Exper ² *1000	-0.358 (0.281)	-0.409*** (0.084)	-0.711*** (0.169)	-0.564*** (0.101)	-0.480*** (0.066)	-0.727*** (0.100)	-0.833*** (0.133)	-0.777*** (0.103)
Female	-0.603*** (0.066)	-0.436*** (0.020)	-0.576*** (0.042)	-0.481*** (0.025)	-0.381*** (0.016)	-0.482*** (0.025)	-0.550*** (0.033)	-0.509*** (0.026)
Capital	0.643*** (0.091)	0.606*** (0.027)	0.550*** (0.059)	0.576*** (0.036)	0.560*** (0.025)	0.609*** (0.037)	0.573*** (0.049)	0.570*** (0.041)
Tenure	0.018 (0.012)	-0.020 (0.013)	0.027*** (0.008)	0.007 (0.004)	0.008*** (0.003)	-0.007 (0.005)	0.001 (0.006)	0.005 (0.005)
Tenure ²	-0.503 (0.400)	1.210 (1.026)	-0.588** (0.246)	-0.101 (0.146)	-0.169* (0.095)	0.289** (0.147)	0.099 (0.199)	-0.055 (0.152)
Private	0.322*** (0.069)	0.335*** (0.020)	0.244*** (0.044)	0.282*** (0.025)	0.293*** (0.017)	0.292*** (0.026)	0.177*** (0.035)	0.197*** (0.027)
Foreign	0.573*** (0.167)	0.292*** (0.053)	0.437*** (0.107)	0.305*** (0.060)	0.296*** (0.044)	0.459*** (0.067)	0.409*** (0.086)	0.382*** (0.069)
10-49	0.019 (0.117)	0.101** (0.040)	-0.058 (0.076)	0.125** (0.050)	0.094*** (0.029)	-0.013 (0.044)	0.126** (0.058)	0.040 (0.044)
50-99	0.019 (0.140)	0.189*** (0.047)	0.041 (0.092)	0.235*** (0.058)	0.152*** (0.036)	0.093* (0.052)	0.178** (0.070)	0.065 (0.053)
100-499	0.138 (0.121)	0.224*** (0.041)	0.074 (0.078)	0.269*** (0.052)	0.231*** (0.031)	0.173*** (0.046)	0.217*** (0.062)	0.089* (0.047)
500-999	0.180 (0.168)	0.273*** (0.053)	0.156 (0.111)	0.294*** (0.068)	0.268*** (0.045)	0.232*** (0.062)	0.148* (0.086)	0.292*** (0.069)
>1000	0.287* (0.150)	0.298*** (0.046)	0.126 (0.100)	0.200*** (0.047)	0.275*** (0.040)	0.214*** (0.059)	0.195** (0.084)	0.185*** (0.061)
N	4435	4325	4461	5393	5302	5448	5278	8014
R	0.062	0.310	0.108	0.183	0.296	0.189	0.114	0.109
a) the sample is restricted to individuals 15-59 years old, b). the variables for missing ownership type and missing size of the company are included but not reported								

Table A.7 - Estimation of the extended Mincerian earnings function (actual years of schooling)

	2003	2004	2005	2006	2007	2008	2009	2010
C	6.159*** (0.223)	7.140*** (0.080)	6.895*** (0.147)	7.186*** (0.090)	7.768*** (0.058)	7.800*** (0.089)	7.792*** (0.123)	8.014*** (0.095)
School	0.081*** (0.013)	0.067*** (0.004)	0.075*** (0.008)	0.080*** (0.005)	0.064*** (0.003)	0.076*** (0.005)	0.070*** (0.007)	0.067*** (0.005)
Exper	0.026** (0.011)	0.021*** (0.003)	0.044*** (0.007)	0.030*** (0.004)	0.021*** (0.003)	0.037*** (0.004)	0.044*** (0.006)	0.040*** (0.004)
Exper ² *1000	-0.494* (0.280)	-0.541*** (0.084)	-0.871*** (0.169)	-0.671*** (0.101)	-0.579*** (0.066)	-0.820*** (0.100)	-0.882*** (0.133)	-0.825*** (0.103)
Female	-0.586*** (0.066)	-0.422*** (0.020)	-0.560*** (0.042)	-0.467*** (0.025)	-0.373*** (0.016)	-0.475*** (0.025)	-0.543*** (0.033)	-0.507*** (0.026)
Capital	0.621*** (0.092)	0.586*** (0.028)	0.530*** (0.059)	0.558*** (0.036)	0.552*** (0.024)	0.602*** (0.037)	0.571*** (0.050)	0.562*** (0.041)
Tenure	0.020 (0.012)	-0.017 (0.013)	0.029*** (0.008)	0.008* (0.005)	0.009*** (0.003)	-0.008* (0.005)	0.002 (0.006)	0.004 (0.005)
Tenure ²	-0.557 (0.401)	1.046 (1.024)	-0.640*** (0.247)	-0.139 (0.146)	-0.169* (0.095)	0.322** (0.147)	0.078 (0.199)	-0.043 (0.152)
Private	0.391*** (0.077)	0.385*** (0.022)	0.312*** (0.048)	0.332*** (0.028)	0.337*** (0.018)	0.326*** (0.028)	0.198*** (0.037)	0.233*** (0.028)
Foreign	0.358 (0.358)	0.679*** (0.107)	0.898*** (0.204)	0.675*** (0.107)	0.451*** (0.073)	0.629*** (0.108)	0.584*** (0.146)	0.796*** (0.122)
10-49	0.014*** (0.118)	0.107*** (0.040)	-0.057 (0.076)	0.126** (0.050)	0.096*** (0.029)	-0.013 (0.044)	0.130** (0.058)	0.041 (0.044)
50-99	0.019*** (0.141)	0.194*** (0.047)	0.039 (0.093)	0.239*** (0.058)	0.154*** (0.035)	0.088* (0.052)	0.183*** (0.070)	0.062 (0.053)
100-499	0.154*** (0.122)	0.233*** (0.042)	0.072 (0.078)	0.270*** (0.052)	0.240*** (0.031)	0.175*** (0.046)	0.214*** (0.062)	0.088* (0.047)
500-999	0.211*** (0.169)	0.294*** (0.053)	0.164 (0.111)	0.297*** (0.068)	0.273*** (0.045)	0.233*** (0.062)	0.152* (0.086)	0.283** (0.069)
>1000	0.318** (0.151)	0.345*** (0.047)	0.179* (0.101)	0.208*** (0.047)	0.301*** (0.040)	0.234*** (0.059)	0.196** (0.085)	0.207* (0.062)
N	4435	4327	4461	5394	5302	5453	5279	8014
R	0.063	0.316	0.109	0.189	0.304	0.194	0.113	0.113
Notes: (a) the sample is restricted to individuals 15-59 years old, (b). the variables for missing ownership type and missing size of the company are included but not reported								

Table A.8 - Estimation of the returns to schooling in Russia on private and foreign enterprises (equation 3)

	2003	2004	2005	2006	2007	2008	2009	2010
C	4.166*** (0.930)	5.345*** (0.286)	3.940*** (0.609)	5.231*** (0.326)	5.597*** (0.266)	5.331*** (0.353)	5.597*** (0.483)	5.918*** (0.375)
School	0.074** (0.037)	0.070*** (0.012)	0.109*** (0.024)	0.082*** (0.013)	0.082*** (0.010)	0.081*** (0.014)	0.083*** (0.020)	0.069*** (0.015)
School*Exper	0.006* (0.003)	0.002** (0.001)	0.000 (0.002)	0.002** (0.001)	0.002* (0.001)	0.002 (0.001)	0.002 (0.002)	0.003** (0.001)
School*Exper ² *1000	-0.115* (0.062)	-0.050*** (0.018)	-0.031 (0.040)	-0.060*** (0.022)	-0.055*** (0.019)	-0.053** (0.024)	-0.064** (0.031)	-0.079*** (0.025)
Exper	-0.051 (0.042)	-0.007 (0.013)	0.051** (0.028)	0.007 (0.015)	0.003 (0.012)	0.014 (0.016)	0.019 (0.022)	-0.001 (0.018)
Exper ² *1000	1.080 (0.802)	0.195 (0.230)	-0.565 (0.532)	0.100 (0.290)	0.119 (0.244)	-0.103 (0.311)	-0.097 (0.412)	0.269 (0.347)
Female	-0.633*** (0.078)	-0.415*** (0.023)	-0.522*** (0.050)	-0.466*** (0.027)	-0.378*** (0.020)	-0.444*** (0.028)	-0.506*** (0.039)	-0.484*** (0.030)
School*Private	-0.049** (0.027)	-0.013 (0.008)	-0.006 (0.017)	-0.009 (0.009)	-0.021*** (0.007)	-0.007 (0.010)	-0.032** (0.013)	-0.023** (0.010)
School*For	-0.039 (0.068)	-0.023 (0.022)	0.035 (0.052)	0.009 (0.023)	0.014 (0.020)	0.006 (0.026)	0.014 (0.035)	0.027 (0.029)
Capital	0.443*** (0.110)	0.603*** (0.032)	0.520*** (0.073)	0.624*** (0.040)	0.626*** (0.031)	0.660*** (0.040)	0.688*** (0.059)	0.628*** (0.047)
Private	1.001*** (0.365)	0.507*** (0.112)	0.348*** (0.235)	0.399*** (0.126)	0.569*** (0.096)	0.374*** (0.134)	0.572*** (0.186)	0.496*** (0.140)
Foreign	1.102 (1.017)	1.030*** (0.320)	0.507 (0.764)	0.567* (0.336)	0.277 (0.294)	0.559 (0.404)	0.498 (0.514)	0.314 (0.440)
Tenure	0.031** (0.013)	-0.024 (0.015)	0.024*** (0.008)	0.011*** (0.004)	0.006** (0.003)	-0.005 (0.005)	-0.002 (0.006)	0.002 (0.005)
Tenure ² *1000	-0.842** (0.375)	1.588 (1.157)	-0.423* (0.240)	-0.173 (0.126)	-0.060 (0.096)	0.243** (0.132)	0.221 (0.178)	0.058 (0.137)
Married	-0.058 (0.089)	-0.003 (0.026)	-0.019 (0.055)	-0.021 (0.030)	0.003 (0.022)	-0.062** (0.031)	-0.097** (0.039)	-0.108*** (0.030)
ln(H)	0.416*** (0.137)	0.353*** (0.041)	0.463*** (0.089)	0.386*** (0.048)	0.374*** (0.039)	0.458*** (0.051)	0.397*** (0.070)	0.401*** (0.054)
Size*1000	0.013 (0.011)	0.010*** (0.003)	0.014** (0.006)	0.000 (0.002)	0.010*** (0.003)	0.005 (0.005)	0.005 (0.005)	0.002 (0.001)
N	2981	3043	2935	4637	3408	4091	3653	5675
R	0.0694	0.3535	0.1257	0.2043	0.3481	0.2292	0.14	0.1388

Notes: (a) Dummies for mixed ownership, no information on ownership and no information on size are included but not reported; (b) standard errors are reported in parentheses

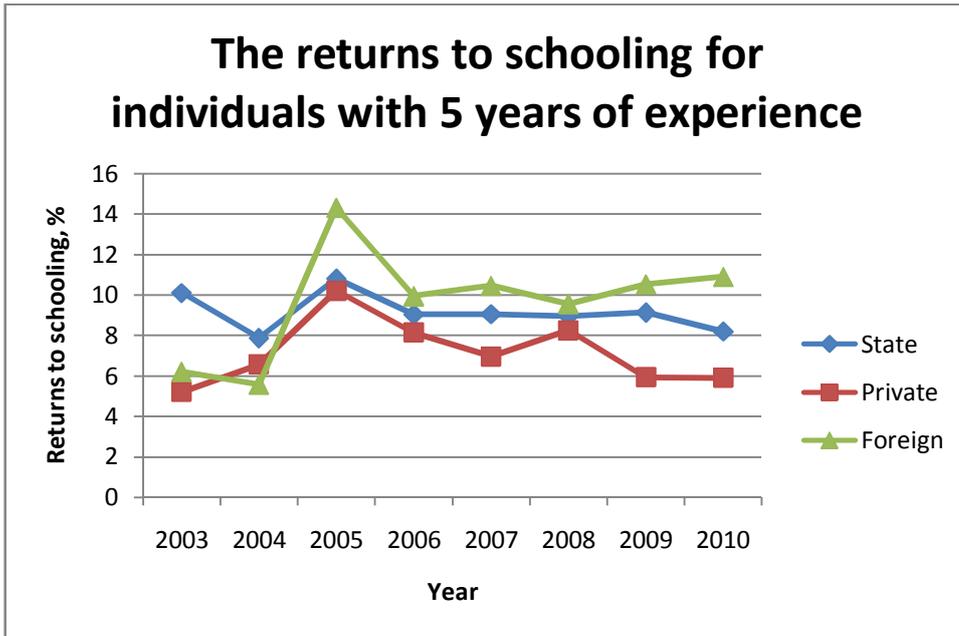


Figure A.1 - The returns to schooling for individuals with five years of labor market experience

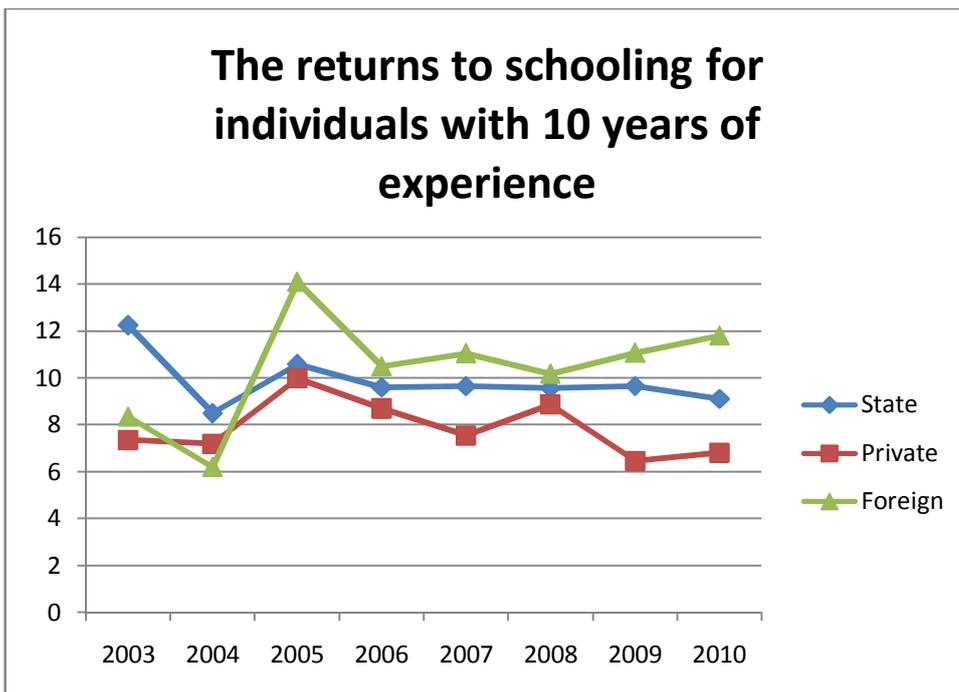


Figure A.2 - The returns to schooling for individuals with ten years of labor market experience

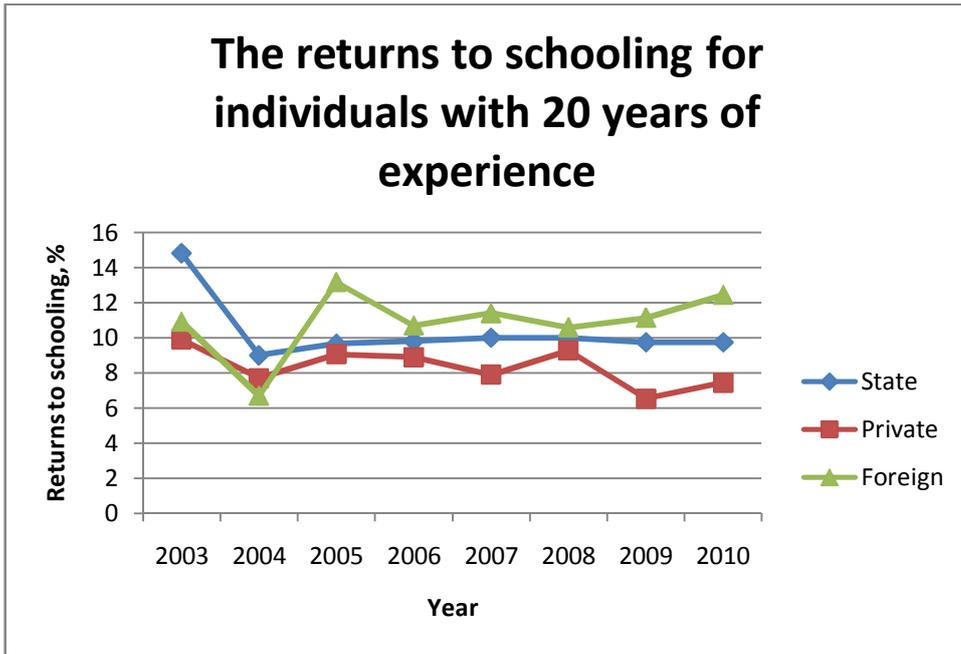


Figure A.3 - The returns to schooling for individuals with twenty years of labor market experience

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