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# The impact of student academic achievement on graduate salaries: the case of a leading Russian university

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**ABSTRACT**

This paper analyses the impact of academic achievement on future salaries by looking into the grade point average (GPA)-earnings relationship for graduates of a leading Russian university. The study is based on pooled cross-sectional graduate survey data for 2014–2015. The issue of how student academic achievement impacts future labour market rewards is analysed through academic, demographic and labour market factors. We found that there is a significant positive impact of GPA on salaries of BA graduates (9–12% wage premium for an additional GPA point) and an insignificant or negative impact for MA programmes graduates. The study depicts that this negative effect can be partially explained by employment sector-specific variables. Among the main factors which positively affect earnings of graduates is work experience. Graduates who combined study and work achieve a 30% wage premium. However, there is no evidence that combining study and work affects student academic achievement, even for those who combined studies with full-time job. Despite the higher GPA of female students, male graduates' earnings are 18% higher. Gender wage differences can be explained by gender distribution by the sector of employment: the over-representation of women in the low-paid education and science sectors and their under-representation in entrepreneurship and corporate sector.

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Academic achievement; student employment; graduates salaries; school-to-work transition; job market signaling

## Introduction

The massive expansion of higher education in Russia during the last two decades has led to a structural transformation from elite to mass higher education. According to the OECD, in 2012 Russia ranked fourth in the world in the percentage of tertiary educated adults (OECD 2016). In such an institutional structure, higher education has become a social norm for the majority of Russian households. The significance of a university diploma as a strong signal of graduate abilities and productivity has decreased.

Mass higher education leads to a strong differentiation between universities' educational standards, in terms of their quality of education and reputation. Considering this, the importance of additional labour market signals that reflect the quality of education or applicant abilities, such as work experience and the quality of education is increasing. The quality of education and applicant abilities can be measured by the selectivity of university, degree or student academic achievement.

This paper answers the following question: What is the effect of student academic achievement on their wages after graduation? How does this differ by gender groups and degree? To answer

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this question, we carried out an empirical analysis of the impact of grade point average (GPA) on earnings of recent graduates of a leading Russian university. In addition to the empirical evaluation, we are interested in an explanation of the mechanisms of this effect.

This study is the first empirical study in Russia that evaluates the impact of academic achievement on salaries of university graduates. The question of the correlation between academic achievement and salaries after graduation is one of the most important for understanding the interconnection between education and the labour market. The empirical results of this study may contribute to the discussion between universities and employers. The study of the interconnection between the educational system and the labour market may identify how the grading systems in universities and in the labour marker correlate, whether different skills and abilities in the two spheres are equally valued. The results of the empirical evaluation of the impact of student grades on future salaries reflect the coherence of higher education and the labour market.

The study is structured as follows. Section 1 presents the institutional framework of the study and discusses the institutional peculiarities of Russian higher education and labour market. In Section 2, we discuss the theoretical literature on the GPA-earnings relationships. Section 3 is devoted to the empirical literature on the impact of GPA on salaries of university graduates. In Section 4, we describe our data, formulate the hypotheses of the study and discuss the limitations and empirical problems of our study. Section 5 presents the empirical analysis of the academic determinants of graduate salaries. Section 6 explores the determinants of academic achievement. Section 7 is devoted to the analysis of the contribution of labour market and academic factors and gender issues to salaries of university graduates. The last section contains conclusions and discussion.

## The institutional framework of the study

Different studies have shown that institutions have a significant impact on the value which is attributed to education by employers and the relationship between different educational characteristics and labour market outcomes (e.g. Bol and Van de Werfhorst 2011). Russian higher education has some institutional peculiarities, which are relevant for our study. In 2003, Russia signed the Bologna agreement, which referred to Russia's transition from traditional Soviet and post-Soviet higher education system to two-step Baccalaureate-Master higher education system. Traditional Soviet higher education was a 5-years education with Specialist degree awarded after its completion. New system intends 4-year studies to get a Bachelor degree and two additional years of studies to get a Master's degree. New system was gradually implemented since 2003 and in 2011 Russia has finally switched to Bachelor-Master degree system. After 2011 Russian higher education institutions did not enrol students on the Specialists programmes, however due to 5-years lags in education process, the last Specialist students graduated in 2016.

One of the main characteristics of transition period was connected to the fact that Bachelor-Master and previous Specialist degree system worked simultaneously. While universities gradually introduced Bachelor and Master programmes they also enrolled students for Specialist degree studies (especially for technology, medicine and law specialties). This created some difficulties for students and their parents, university administration and employers. During 2010–2015 Russian labour market had to adjust to the waves of graduates of the Bachelor, Specialist and Master programmes. It created significant difficulties for the employers due to the increase of the asymmetry of information. It was very difficult to understand the differences between these graduates and to distinguish them by quality of education and productivity because employers get used to traditional Specialist system. All these difficulties have led to a bias of incentives of students and shift of their educational strategies and trajectories. Together with mass and highly differentiated by quality higher education this created powerful incentives for students to combine study and work to get additional labour market signal such as work experience which was valued by employers.

The case of **National Research University Higher School of Economics (HSE University)**[1] is of importance because this is a leading Russian university which was one of the first Russian state universities, which implemented and developed Bachelor and Master's programmes system in 1992, before Bologna agreement was signed by Russian government. HSE University is one of the leaders of Master's education in Russia, having more sensitive 10-point grading system instead of ordinary Soviet five-point grading system. The Bachelor-Master system is common for HSE University, its students and graduates and for the segment of employers which hire HSE University graduates, but for the vast majority of employers in the labour market this system was unclear. Different studies in the Russian labour market show that in general employers do not distinguish between students with Bachelor, Specialist or Master degree. This creates powerful incentives for students to minimise the efforts during studies in Master programmes and combine Master studies with full-time job.

The results of previous studies show that 80% of Master students combine study and work and tend to work more than 30 h per week that might affect their academic achievement (Roshchin and Rudakov 2017). Summarising this, we may expect significant differences in returns to academic achievement by degree caused by institutional peculiarities of Russian educational system and labour market.

## The impact of student academic achievement on graduate salaries: theoretical approach

There are a wide range of theories that propose explanations for the relation between academic achievement and graduate labour market outcomes, which are presented in overview studies (e.g. Bills 2003). Most relevant for the purpose of our study explanations of the effect of student academic achievement on future labour market outcomes can be formulated on the basis of human capital theory and job market signalling theory. Alternative view for the explanation of the GPA-earnings relationship cis presented by sociological theories: the theory of educational credentialing and theories of social reproduction (e.g. the theory of cultural capital).

According to human capital theory, academic achievement reflects the amount of human capital that was acquired through university education (Becker 1964; Mincer 1989). Depending on the individual abilities and efforts made by students during their study, individuals accumulate a different amount of knowledge and competences that can be measured by academic achievement (for instance, GPA). Hence, students with a higher GPA have accumulated a higher amount of human capital and will get a higher return on this human capital in terms of salaries. This results in a positive impact of GPA on earnings.

According to job market signalling, high academic achievement may be used for employee selection as an additional signal about applicant abilities and by this provide a return in terms of wages (Spence 1973; Arrow 1973; Stiglitz 1975). Student academic achievement (for instance diploma cum laude or high GPA) is a signal for employers about the high potential productivity of applicants or employers. Thereby it can be a tool for the selection of workers with higher abilities and potential productivity and bring economic returns in terms of higher salary for those who acquire these signals.

Student academic achievement (for instance, diploma cum laude or high GPA) is a signal for employers about the high potential productivity of applicants to employers. Thereby, it can be a tool for the selection of workers with higher abilities and potential productivity and bring economic returns in terms of higher salary for those who acquire these signals. Arcidiacono, Bayer and Hismo (2010) argue that higher education is not only tool for the selection of individuals by their abilities but plays a direct role in revealing ability to the labour market. Higher education provides graduates with opportunity to confirm their abilities to employers as the CVs of university graduates contain a wide range of information including grades, results of different tests, etc. All this information can reveal graduate abilities and confirm it to employers. Cognitive abilities

revealed by academic achievement and measured by GPA provide a return in terms of salaries in the labour market both as an element of human capital and as a signal.

Anlternative explanation of the impact of educational characteristics on labour market outcomes is given by educational credentialism. The theory of educational credentialing, which has been presented, reviewed and discussed in numerous studies (Berg 1971; Collins 1979; Bills 2003; Baker 2011; Brown and Bills 2011; Brown 1995; Bol and Van de Werfhorst 2011) proposes that degrees become an instrument for the creation of exclusionary barriers and securing access to highly paid and prestigious occupations. According to Baker (2011), 'the increasing proportion of individuals in each new generation believe in the power of degrees to both allocate individuals in the labour market and serve as job requirements throughout the occupational structure'. Rising employer requirements and the massification of higher education has led to credentialing inflation, when employers require increasing amounts of credentials to confirm the qualification, and students, knowing this, tend to achieve more advanced degrees (Baker 2011). In terms of GPA, this phenomenon is reflected by grade inflation – the sustainable growth of GPA all over the world in the last decades which eliminates the difference between students with high and low abilities, and as a result, the signalling role of GPA is decreasing (Johnson 2006). This has implications which might potentially explain the insignificant or even negative impact of GPA on salaries.

To deal with grade inflation (i.e. decreasing value of academic achievement), students tend to acquire work experience which is another important signal in the labour market that in terms of mass higher education may bring high returns (Apokin and Yudkevich 2008; Roshchin and Rudakov 2015, 2017). Moreover, there might be reversed causality: students combining study and work could get a wage premium for their work experience. Accumulation of work experience demands additional efforts and more time dedicated to work and less to study, which eventually could *negatively affect academic achievement*. According to the results of previous studies, low intensity of student employment (12–20 h a week) does not affect academic achievement and in some cases has positive impact. While intensive employment (more than 20 h a week) significantly reduces academic achievement and increases the probability of dropping out (Ehrenberg and Sherman 1987; Hovdhaugen 2015).

Another explanation of the impact of university quality or GPA on labour market outcomes is given by theories of social reproduction and more specifically by the theory of cultural capital (Bourdieu and Passeron 1977). According to cultural capital theory, higher education is seen as a tool for the accumulation of cultural capital, which will bring rewards after graduation. Depending on the amount of accumulated cultural capital, its holders may form groups of different status, which are reproduced in the process of socialisation and education. Employers who hire graduates for particular highly privileged and well-paid positions may value specific cultural resources and reward the amount of accumulated cultural capital (Kingston 1981). Higher academic achievement which can be reflected by a degree from a prestigious university or diploma *cum laude*, is one of the institutionalised forms of cultural capital and may provide higher returns. In this issue, the theories of cultural capital and credentialing overlap.

The massification of higher education has led to an increase of significance of university quality as a signal in the labour market. Employers value a diploma of an elite university as this imply rigorous selection and only the most talented students with high abilities and potential productivity can graduate from such universities. The diploma of prestigious university can be much more significant signal in the labour market than academic achievement that decreases the student motivation to take efforts and achieve a high GPA. Moreover, students studying in leading universities are more homogeneous in their abilities than students of ordinary universities due to the selection process (Hershbein 2013). Therefore, a lack of student motivation and low heterogeneity in the abilities of students from selective universities may result in *the insignificant or even negative effect of GPA on future earnings* of graduates of the leading universities. This explanation can be relevant for the purpose of our study.

Another sociological concept – theory of conventions of coordination and the composition of economic arrangements assumes the autonomy of the higher education sphere and the labour market in terms of the evaluation of different qualities of individuals (Boltanski and Thevenot 2006). In this case, it can be assumed that higher education institutions and employers may value different skills. As a result, universities and employers reward different elements of a graduate's human capital and higher academic achievement could not affect labour market outcomes.

## The impact of student academic achievement on graduate salaries: results of empirical studies

Most of the studies analyse the impact of student grades on their future salaries using standard Mincer wage equation, where the dependent variable is the natural logarithm of graduate salaries and a set of independent variables is represented by student academic achievement (grades), other educational and socio-demographic factors. The majority of researchers use GPA as a measure of academic achievement (Wise 1975; Filer 1983; Jones and Jackson 1990), but some researchers use graduation with honours (cum laude) as a measure of academic achievement (Di Pietro 2010; Freier, Schumann, and Siedler 2015).

In general, researchers have identified the positive impact of academic achievement on the salaries of graduates. For instance, Wise, using the data of a large American company in the 1960s proved that additional score of GPA increases starting salaries of graduates by 4–6% (Wise 1975). Jones and Jackson (1990) using the sample of graduates of the American university in the 1980s found 8% wage premium for additional GPA score. Freier, Schumann and Ziedler (2015) using graduates panel data in Germany (1994–2006) revealed the 14% wage premium for law students graduating with honour. Rumberger and Thomas (1993) using Recent College Graduates survey found 3–5% wage premium for additional GPA point, as James and Alsalam et al.(1989) who used National Longitudinal Survey of Youth (NLSY) data for the 1980s. Zhang (2008) revealed 6% return on GPA point using Bacalaureat and Beyond data for 1994–2003.

Considering the results of empirical studies on the impact of GPA on graduate salaries, we can conclude that in general, most of researchers have identified the positive impact of academic achievement on the salaries of graduates (Wise 1975; Filer 1983; James and Alsalam 1989; Jones and Jackson 1990; Rumberger and Thomas 1993; Pascarella and Terenzini 2005; Thomas and Zhang 2005; Zhang 2008; Bills 2003; Di Pietro 2010; Lang and Siniver 2011; Hershbein 2013; Freier, Schumann, and Siedler 2015). On average, there is a 5–7% wage premium for an additional GPA point. But there might be differences in magnitude of this impact which depends on several factors.

It is considered that the heterogeneity in return on academic achievement is mainly caused by the quality of the university, gender differences, labour market factors and the time period (short-run, long-run). Filer found that the return on good grades is higher for female graduates (Filer 1983). Some studies found no positive effect of GPA on wages for male graduates, while for female graduates the effect is positive (Rumberger and Thomas 1993). These differences can be explained by the fact that potentially discriminated groups in the labour market intend to get better education and achieve higher GPA to reveal their abilities to employers (Arcidiacono, Bayer and Hismo 2010)

The significance of academic achievement as a signal in the labour market may differ in the short-term and long-term periods. Altonji and Pierret (2001) developed EL-SD (employer learning-statistical discrimination model) which implies that employers hire recent graduates and set wages on the basis of observable characteristics, associated with productivity (signals). One of the implications of EL-SD is that comparing graduates with the equal education level, employers may use GPA as an additional factor. The employers would prefer graduates with a higher GPA, assuming that academic achievement reflects productivity. However, in the long-run employers get

more information about employee productivity by job performance (what is called employer learning) and the role of different signals may decline in the long-run (Altonji and Pierret 2001; Di Pietro 2010).

## Data, research hypotheses and limitations of our study

According to the considered theoretical concepts and the results of empirical studies, we formulate the following hypotheses:

H1. GPA positively affects graduate starting salaries as high academic achievement reflects a larger amount of accumulated human capital which brings higher returns in terms of salaries and a high GPA is a positive signal for employers about the graduate's abilities.

H2. Combining study and work positively affects salaries and negatively affects GPA, which results in the absence of a positive impact of GPA on salaries through reversed causality.

H3. Alternative factors rather than GPA (e.g. gender, degree) affect salaries to a higher extent.

Our study is based on the data of a cross-sectional graduate survey carried out by National Research University Higher School of Economics (HSE University). The data were collected for students graduated from HSE University, 6 months after graduation in 2014 and 2015, respectively. We used data from two waves of surveys (2014, 2015) and analysed it as pooled cross-sectional data. The data were collected by an online survey method.

The initial sample is comprised by 1,812 graduates: 41% graduated with a Bachelor's degree, 13% with a Specialist degree and 46% with a Master's degree. The sample is representative for all HSE University graduates in terms of GPA, age and salaries after graduation (Annex, Table A1). However, female students and Master's students are over-represented in our sample compared to the general population. The response rate of the survey is 24.8% (Annex, Table A2).

On the first stage of the process of formation of the final sample we excluded graduates, who continued their studies in HSE University or any other Russian university in other educational programmes (287 observations) as they dedicate more time to study and less to the labour market. On the second stage we excluded graduates over 30 years of age at the time of the survey (62 observations) as this group differs from other graduates in terms of accumulated work experience that can lead to a bias in our estimates of the impact of GPA on earnings. We also excluded 1% of observations in tails of wage distribution (23 observations). To test the robustness of our results we estimate regressions for the subsamples with exclusion of 3% of observations on the top of the wage distribution.

The descriptive statistics of the final sample are presented in Table 1. The mean monthly salary of 2014–2015 HSE University graduates according to the statistics of Russian Ministry of Education is 65.3 thousand rubles and for our sample is 63.6 thousand rubles. HSE University graduates had rather high academic achievement: mean GPA is 7.4 for the total population of graduates and 7.5 – for our final sample (Table 1).

We obtained grades of Unified State Exam (USE) (The Russian equivalent of SAT) for Bachelor students in the sample. USE is the exam that all Russian high school graduates pass and on the

**Table 1.** Sample descriptive statistics.

| Variable | *N* (Obs) | Mean | St. dev | Min | Max |
|---|---|---|---|---|---|
| Salary (thousand rubles) | 915 | 63,6 | 31,0 | 12,4 | 192,1 |
| GPA (10-points scale) | 1462 | 7,5 | 0,9 | 4,5 | 9,8 |
| USE (100-point scale) | 357 | 76,6 | 7,2 | 54,5 | 99,0 |
| Age | 1463 | 24,0 | 1,7 | 21,0 | 30,0 |

basis of USE score, school graduates compete for government funding and enrollment in the university. As HSE University is a leading and selective university average USE score is high (76.6 of 100). Graduate's USE grade as well as GPA can be used as a proxy for individual abilities. Average age of HSE University graduates is 24 and it varies by degree: from 22.6 for graduates with Bachelor degree to 24.9 for Master's.

Sample distribution by key variables (salary, GPA, USE and age) is presented in Figure 1.

### *Limitations of the study and problems of the empirical evaluation*

In the empirical part of research, we face with the following problems, which put limitations on the results of our study:

(1) Self-selection bias. An online survey meant that graduate participation in the survey was voluntary. As a result, respondents who decided to participate in the survey differ by some characteristics from those who did not participate, which creates a self-selection bias. This measurement problem is partially solved by the fact that our sample represents all HSE University graduates by GPA and salaries. However, graduates of Master's programmes and female graduates are over-represented in our sample (Annex, Table A2). We deal with this problem by the estimation of ordinary least square (OLS) regressions by subsamples, formed by gender groups and degrees.

(2) Endogeneity. The endogeneity problem is connected with abilities of graduates that might significantly affect academic achievement, salaries and are unobservable. Endogeneity is also connected with reverse causality because of the potential positive effect of student employment on earnings (Roshchin and Rudakov 2016) and the negative effect of student employment on academic achievement that might result in negative impact of GPA on earnings. We try to deal with endogeneity by including different proxies for student abilities such as GPA and USE grades. Moreover, students and graduates of leading universities are usually more homogeneous in their abilities because of strong selection in the application process and during studies.

(3) Time period. Our study is based on pooled cross-sectional data and we do not have panel data to observe graduate's wage trajectories in the long-run. Meanwhile, labour market outcomes of different academic characteristics (university quality, academic achievement) and strategies of school-to-work transition may differ in the short-run and in the long-run.

(4) 'Case study'. We do not have a nation-wide sample with records on university grades and salaries of university graduates. Our analysis is based on the data of one leading university that is famous, due to more developed Master programmes and a more sensitive grading scale. Nevertheless, we should consider that returns to academic achievement in selective

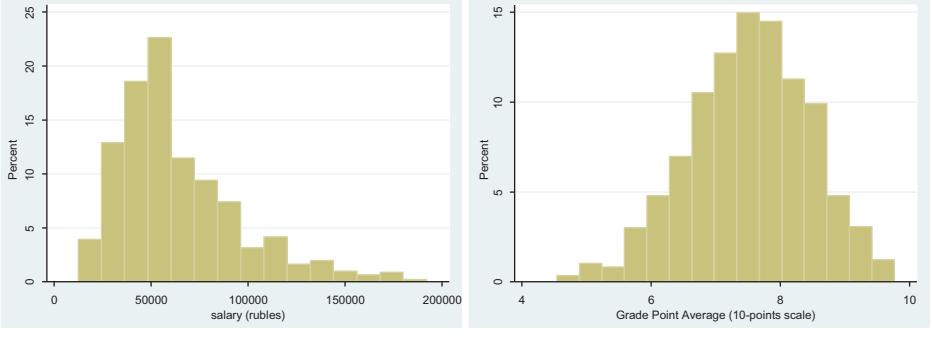


**Figure 1.** Sample distribution (graduate salary, GPA).

and leading universities might be lower than in ordinary universities, as university quality is a more significant signal than academic achievement that might decrease the student motivation to achieve higher grades. Moreover, students of leading universities are usually more homogeneous in their abilities (Hershbein 2013).

(5) Social capital. Family financial and social capital may significantly affect starting salaries of university graduates. Our data do not comprise information on the families of university graduates, which may potentially affect our results.

## The empirical analysis of academic determinants of graduate salaries

Among the main factors that may potentially affect graduate salaries and GPA are: the achieved degree, source of funding, employment while studying, gender and field of study. Preliminary analysis shows that average salaries of Master graduates are 17% higher than salaries of Bachelor students (Table 2). This wage premium can be connected not only with returns to the Master degree but also with age differences and returns to work experience. On average, master students achieved higher GPA than Specialist and Bachelor graduates (Table 2).

Our analysis shows that average salaries of HSE University graduates who combined study and work are much higher than for those who only studied. Thus, by accumulation of work experience before graduation students acquire an important competitive advantage in the labour market. Work experience and university degree are significant signals for employers about abilities and potential productivity of individuals that reflects in higher salaries. At the same time, there are no differences between students who combined study and work and those who did not in terms of GPA. By this, we can assume that combining study and work does not significantly impact student academic achievement, but we should take into consideration that our sample does not include those who were dropped out because of poor academic achievement.

We also obtained more detailed variable that reflects student employment. It splits those who combined study and work on three groups dependent on work intensity: those who worked full-time, part-time or irregular. The descriptive analysis depicts that graduate salaries are positively correlated with work intensity and at the same time differences in academic achievement by employment intensity are insignificant. Master's programmes significantly differ from Bachelor programmes in the share of government-funded students. The development of Master programmes, in context of reformation of degree

**Table 2.** Sample distribution, average salary and GPA by degree, source of funding, student employment and gender.

| Variable | *N* (Obs) | Share in the sample (%) | GPA | Salary (th. rubles) |
|---|---|---|---|---|
| The sample | | | 7,5 | 63,6 |
| | | **Degree** | | |
| Bachelor degree | 461 | 31,5 | 7,3 | 58,2 |
| Specialist degree | 216 | 14,8 | 7,1 | 54,7 |
| Master degree | 786 | 53,7 | 7,7 | 68,3 |
| | | **Source of funding** | | |
| Self-funded | 383 | 26,2 | 7,1 | 65,7 |
| Government-funded | 1080 | 73,8 | 7,7 | 62,9 |
| | | **Student employment** | | |
| Combined study and work | 1230 | 84,0 | 7,5 | 65,5 |
| No work experience | 233 | 16,0 | 7,4 | 48,3 |
| | | **Student employment (detailed)** | | |
| Full-time employment | 498 | 34,0 | 7,5 | 74,1 |
| Part-time employment | 369 | 25,2 | 7,6 | 61,2 |
| Irregular employment | 362 | 24,7 | 7,5 | 54,2 |
| No work experience | 234 | 16,0 | 7,4 | 48,4 |
| | | **Gender** | | |
| Male | 539 | 63,1 | 7,2 | 70,9 |
| Female | 924 | 36,9 | 7,7 | 59,2 |

systems, implies a large-scale government funding and availability of more government grants resulting in less competitive basis of enrollment.

Students studying Master programmes are more likely to combine study and work: 90% of Master students combined study and work that is connected to lower workload compared to BA studies and necessity of accumulation of the work experience (Table 3). Differences in work intensity by degree are also considerable: on average, Master students are much more likely to have full-time job, while Bachelor students prefer to work part-time or irregular (Figure 2).

To estimate the impact of student academic achievement on future labour market outcomes we used the standard Mincer wage equation and applied OLS regression for employed graduates (1).

Our research uses the estimation of the following regression models:

$$Ln(W_i) = \beta_0 + \beta_1\ GPA_i + \beta_2\ Acad_i + \beta_3\ Dem_i + \beta_4\ St\_Work_i + \varepsilon \quad (1)$$

$$GPA_i = \beta_0 + \beta_1\ Acad_i + B_2\ Dem_i + \beta_3\ St\_Work_i + \beta_4\ Job_i + \varepsilon \quad (2)$$

$$Ln(W_i) = \beta_0 + \beta_1\ GPA_i + \beta_2\ Acad_i + \beta_3\ Dem_i + \beta_4\ St\_Work_i + \beta_5\ Job_i + \varepsilon \quad (3)$$

Where:

$Ln(W_i)$ is the logarithm of average monthly salary of university graduates.

$GPA_i$ is a graduate grade point average while studying in HSE University (on a scale from 0 to 10).

$Acad_i$ is a set of academic factors (degree, field of study, etc.).

$Dem_i$ is a set of demographic factors (gender, age).

$St\_Work_i$ is a dummy variable for combining study and work.

$Job_i$ is a set of labour market factors (sector of employment, tenure, etc.).

**Table 3.** Descriptive statistics by degree.

| | Bachelor | Master (%) | Sample (%) |
|---|---|---|---|
| Source of funding | | | |
| Self-funded | 42,3 | 12,9 | 26,2 |
| Government-funded | 57,7 | 87 | 73,8 |
| Student employment | | | |
| Combined study and work | 76,8 | 89,8 | 84 |
| No work experience | 23,2 | 10,1 | 16 |

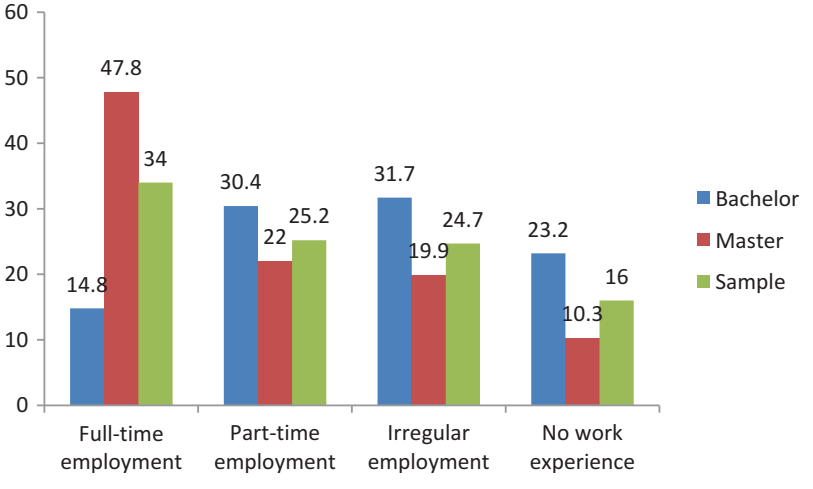


**Figure 2.** Intensity of employment by degree (%).

We also applied Heckman correction as OLS results may be biassed due to self-selection in employment. Equations are estimated for the whole sample and we also estimate separate regressions for graduates with different degrees – Bachelor, Specialist, Master and use interaction terms between GPA and degree. Regression analysis uses the estimation of determinants of academic achievement (2) to reveal the determinants of high GPA and the impact of combining study and work on academic achievement.

The analysis of the correlation matrix and the estimation of VIF-statistics show that there is no multicollinearity in the model (Table A3). The analysis of the correlation matrix of the main variables has shown that there is some correlation between prior academic achievement (USE grade, government-funded studies) and GPA, and between age, tenure and degree. As a result, we included such variables as USE and GPA, as well as, tenure and age separately in our regression models. Although state-funded studies, GPA and age are correlated, we have to include them in the model as the main descriptive variables. The estimation of VIF-statistics after the regression shows that multicollinearity is not a problem in our model. The Breush-Pagan test shows that there is no heteroscedasticity in the model. These results proved that the assumptions of the OLS model are met and our results are unbiassed.

The results of the reduced model evaluation, which includes academic and socio-demographic factors (1) are presented in Table 4. It is estimated for the whole sample and by degree and gender groups. The post-regression estimations show that our regressors are moderately correlated and multi-collinearity is not a problem in the model (VIF is 3.6) and the hypothesis of the existence of hetero-scedasticity in the model was rejected on the basis of the Breush-Pagan test (Table 4).

The regression results show that although the correlation between GPA and salaries for the whole sample is insignificant, there are significant differences in the impact of GPA on earnings by degree Table 4 (1). Academic achievement has a strong positive effect on future earnings for Bachelor graduates: one GPA point increases graduate salaries by 9.8% (Table 4 (3)).

At the same time, academic achievement has strong negative effect for Master students: one GPA point decreases graduate salaries by 8.3% (Table 4 (5)). These results do not correspond with results of previous studies and from the first view seems counter-intuitive but actually they reflect institutional peculiarities of the Russian educational system, especially the difficulties in the implementation of an efficient Master programme teaching. Students who combined study and work earns 29–35% more than those who dedicated all their time to studies, the returns on work experience before graduation is higher for Master students.

We also used another specification with intensity of employment instead of basic dummy and achieved almost the same results: insignificant for the general sample, but positive for Bachelor students (10%) and negative for Master students (−7.4%) (Table 4 (8)–(10)). The effect of the intensity of combining study and work is even stronger than for the dummy-variable: graduates who worked full-time during studies earn 40–48% more than those who did not work, those who worked part-time earn 19–28% more, even graduates combining studies with an irregular job get a wage premium compared to those who did not work (Table 4 (8)–(10)).

Gender differences and work experience before graduation are among the most important predictors of graduate salaries. There is a significant gender wage gap: starting salaries of male graduates are 39% higher for Bachelor degrees and 13% higher for Master degrees. Analysis by gender groups shows that the impact of GPA on salaries of male and female graduates is insignificant. There are some gender differences in returns on degree: a wage penalty for female graduates with a Specialist degree compared to BA, and a premium for male graduates with an MA degree (Table 4 (6)–(7)). By field of study there is a considerable wage premium for degrees in Economics, Statistics, Finance (especially for graduates with BA degree) and for Business, Management and Computer Science (for MA degree).

The empirical analysis shows that the results of Unified State Exam (USE grade), is a good predictor of future earnings. We found that 10 additional USE grades increase graduate salaries by 9.7% and USE is almost equal in terms of the magnitude of positive impact on earnings

**Table 4.** The results of the regression analysis of the impact of GPA on graduate salaries (OLS, reduced specification, academic factors only: sample (1), reduced sample (2), Bachelor subsample (3)–(4), USE as a proxy for academic achievement (4), Master's sample (5), by gender (6)–(7), specifications with student employment intensity (8)–(10)).

| | Sample (1) | Reduced sample (2) | BA (3) | BA (USE) (4) | MA (5) | Male (6) | Female (7) | Sample (8) | BA (9) | MA (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Variables | lnwage | | | | | | | lnwage | | |
| | | | | | | | | Combining study and work (intensity) | | |
| | (1) | | | | | | | | | |
| | Combining study and work (dummy) | | | | | | | | | |
| GPA | −0.0254 | −0.0117 | 0.0988** | | −0.0830*** | −0.0304 | −0.0146 | −0.0194 | 0.101** | −0.0740*** |
| | (0.0212) | (0.0181) | (0.0427) | | (0.0289) | (0.0287) | (0.0334) | (0.0209) | (0.0418) | (0.0286) |
| USE (1–10 scale) | | | | 0.0978* | | | | | | |
| | | | | (0.0538) | | | | | | |
| **Source of funding: reference group (self-funded)** | | | | | | | | | | |
| Government-funded | −0.0259 | −0.00996 | −0.0206 | | −0.145** | −0.0215 | −0.00512 | −0.0102 | −0.0138 | −0.119* |
| | (0.0447) | (0.0381) | (0.0742) | | (0.0701) | (0.0593) | (0.0710) | (0.0439) | (0.0724) | (0.0696) |
| **Degree: reference group (Bachelor students)** | | | | | | | | | | |
| Specialist | −0.0209 | 0.0147 | | | | 0.0986 | −0.202* | −0.00918 | | |
| | (0.0674) | (0.0572) | | | | (0.0854) | (0.113) | (0.0662) | | |
| Master | 0.0783 | 0.115** | | | | 0.163** | −0.0349 | 0.0316 | | |
| | (0.0530) | (0.0450) | | | | (0.0659) | (0.0935) | (0.0528) | | |
| **Student employment: reference group (no work experience)** | | | | | | | | | | |
| Combined study and work | 0.293*** | 0.259*** | 0.276*** | 0.361*** | 0.315*** | 0.309*** | 0.209** | | | |
| | (0.0530) | (0.0449) | (0.0863) | (0.0845) | (0.0806) | (0.0636) | (0.0976) | | | |
| **Student employment intensity: reference group (no work experience)** | | | | | | | | | | |
| Full-time | | | | | | | | 0.421*** | 0.484*** | 0.400*** |
| | | | | | | | | (0.0567) | (0.105) | (0.0820) |
| Part-time | | | | | | | | 0.250*** | 0.283*** | 0.193** |
| | | | | | | | | (0.0572) | (0.0920) | (0.0880) |
| Irregular | | | | | | | | 0.149** | 0.113 | 0.224** |
| | | | | | | | | (0.0614) | (0.0994) | (0.0935) |
| **Gender: reference group (female)** | | | | | | | | | | |
| Male | 0.186*** | 0.141*** | 0.394*** | 0.391*** | 0.135*** | | | 0.187*** | 0.366*** | 0.138*** |
| | (0.0372) | (0.0317) | (0.0756) | (0.0781) | (0.0467) | | | (0.0365) | (0.0741) | (0.0461) |
| Age | 0.0154 | 0.0177 | 0.00529 | 0.0302 | 0.0102 | 0.00594 | 0.0213 | 0.00834 | −0.00689 | 0.00305 |
| | (0.0134) | (0.0114) | (0.0371) | (0.0443) | (0.0155) | (0.0177) | (0.0212) | (0.0132) | (0.0364) | (0.0154) |
| **Field of study: reference group (humanities)** | | | | | | | | | | |
| Mathematics and electronics | −0.204 | −0.216* | | | −0.190 | −0.205 | −0.156 | −0.213 | | −0.182 |
| | (0.136) | (0.119) | | | (0.169) | (0.179) | (0.245) | (0.134) | | (0.166) |
| Business and management | 0.205* | 0.167 | 0.166 | 0.0885 | 0.241** | 0.210 | 0.190 | 0.182 | 0.180 | 0.220* |
| | (0.120) | (0.105) | (0.165) | (0.470) | (0.121) | (0.141) | (0.229) | (0.118) | (0.162) | (0.119) |

(*Continued*)

Table 4. (Continued).

| | Sample (1) | Reduced sample (2) | BA (3) | BA (USE) (4) | MA (5) | Male (6) | Female (7) | Sample (8) | BA (9) | MA (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Other programmes | −0.185 | −0.0618 | −0.144 | −0.154 | −0.135 | −0.167 | −0.226 | −0.163 | −0.0447 | −0.134 |
| | (0.136) | (0.119) | (0.178) | (0.479) | (0.147) | (0.160) | (0.254) | (0.133) | (0.176) | (0.145) |
| Media communications, design | 0.0318 | −0.00613 | 0.0689 | 0.0509 | 0.0933 | 0.0121 | 0.213 | −0.00176 | 0.0379 | 0.0729 |
| | (0.126) | (0.110) | (0.162) | (0.468) | (0.142) | (0.146) | (0.257) | (0.124) | (0.158) | (0.140) |
| Computer science | 0.195 | 0.216* | 0.0739 | −0.106 | 0.291* | 0.0212 | 0.283 | 0.189 | 0.0982 | 0.279* |
| | (0.140) | (0.122) | (0.187) | (0.478) | (0.154) | (0.182) | (0.248) | (0.138) | (0.183) | (0.152) |
| International economics and politics | 0.0313 | 0.0321 | −0.122 | −0.102 | 0.221 | 0.131 | −0.155 | 0.0559 | −0.0464 | 0.234 |
| | (0.133) | (0.115) | (0.176) | (0.473) | (0.146) | (0.156) | (0.251) | (0.130) | (0.173) | (0.144) |
| Law | 0.0882 | 0.0167 | 0.178 | 0.292 | 0.0946 | 0.0218 | 0.197 | 0.0222 | 0.128 | 0.0265 |
| | (0.132) | (0.115) | (0.247) | (0.505) | (0.143) | (0.157) | (0.246) | (0.130) | (0.242) | (0.142) |
| Social sciences | −0.0704 | −0.0720 | 0.0693 | −0.0372 | −0.0850 | −0.0419 | −0.145 | −0.0623 | 0.107 | −0.0756 |
| | (0.122) | (0.106) | (0.156) | (0.468) | (0.124) | (0.142) | (0.236) | (0.119) | (0.153) | (0.122) |
| Economics, statistics, finance | 0.203* | 0.175 | 0.342** | 0.261 | 0.147 | 0.221 | 0.190 | 0.160 | 0.324** | 0.110 |
| | (0.122) | (0.107) | (0.161) | (0.467) | (0.124) | (0.148) | (0.226) | (0.120) | (0.157) | (0.123) |
| **Year of survey (2014)** | | | | | | | | | | |
| 2015 | 0.0479 | 0.0571* | 0.000855 | 0.00208 | 0.0699 | 0.0575 | 0.0404 | 0.0379 | 0.00412 | 0.0457 |
| | (0.0350) | (0.0299) | (0.0691) | (0.0743) | (0.0443) | (0.0443) | (0.0581) | (0.0344) | (0.0674) | (0.0440) |
| Constant | 10.61*** | 10.38*** | 9.833*** | 9.254*** | 9.321*** | 10.81*** | 10.65*** | 10.47*** | 9.796*** | 11.16*** |
| | (0.379) | (0.329) | (0.970) | (1.176) | (1.171) | (0.499) | (0.607) | (0.376) | (0.946) | (0.476) |
| Observations | 938 | 899 | 262 | 208 | 208 | 585 | 353 | 938 | 262 | 548 |
| *R*-squared | 0.157 | 0.183 | 0.224 | 0.297 | 0.295 | 0.137 | 0.152 | 0.190 | 0.268 | 0.188 |
| VIF | 3.6 | | | | | | | | | |
| Breush-Pagan test (chi-2) | 0.24 | | | | | | | | | |

Standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

with GPA (Table 4 (4)). One of the limitations of the analysis on the basis of USE is that USE grades are available for BA students only. These results provide evidence of the importance of prior achievement and socio-economic background for future labour market outcomes. It shows that the inequality in earnings of graduates is initially formed at school and due to differences in family cultural capital, and later it is fixed at university. These results determine the relevance of the analysis of the predictors of high GPA and the analysis of the contribution of GPA to graduate salaries. The results of the reduced specification (Table 4 (2)) with exclusion of the top 3% of observations shows the overall robustness of the results for the main determinants and the impact of GPA on graduate salaries which is insignificant for the sample with one interesting exception: compared to base model a premium for a MA studies appeared. The regression results raise the following question: 'Why do we have such controversial results about the impact of GPA on earnings for Bachelor's and Master students?' According to the results of previous studies in the Russian labour market, the vast majority of Master students combine study and work and they tend to work longer hours (Roshchin and Rudakov 2017).

The descriptive analysis of our sample shows that 89% of Master students combined study and work and that Master students are more likely to have full-time employment. Considering this, we can assume that the negative impact of GPA on earnings of Master programme graduates can be caused by reversed causality. This reversed causality implies that, on the one hand, combining study and work positively affects future earnings and this is proved by results presented in Table 4 and consistent with the results of previous studies (Roshchin and Rudakov 2015). On the other hand, student employment while studying implies that students allocate plenty of time to their job (results of previous studies shows that Master students, on average, work 30 h a week). This time allocation leads to the fact, that students do not have enough time to study which may negatively affect their academic achievement. This situation might create negative effect of GPA on earnings through reversed causality (H2).

## Determinants of academic achievement: the effect of student employment

To test the formulated hypothesis (H2) we estimated a regression for determinants of student academic achievement. The post-regression estimations show that multi-collinearity and heteroscedasticity do not affect our model (the results of VIF and Breush-Pagan test are presented at the bottom of Table 5). The results of the regression analysis of the determinants of GPA show that the effect of combining study and work on the academic achievement is insignificant for any specification: for the whole sample, BA and MA graduates and by gender (Table 5 (1–5))

However, we have to take into account some limitations, which arise due to the fact that the sample of university graduates does not include those who dropped out and dropouts may be caused by combining study and work, but we cannot prove this hypothesis. We also estimated a regression for an alternative specification that includes student employment intensity. We achieved almost the same results, that there is no negative impact of combining study and work on academic achievement of university graduates. Moreover, we found a weak positive correlation between part-time employment and GPA (Table 5 (6)). These results let us *reject the hypothesis of reversed causality* that leads to the negative impact of GPA on earnings: we found no evidence that student employment affects academic achievement (Table 5).

The strong positive correlation between studying on Master programmes and GPA can be explained by *grade inflation in Master programmes* compared to Bachelor programmes. This grade inflation together with low average educational standards in Master programmes in Russia and lower workload compared with Bachelor programmes and higher student employment rates are the main explanation of the counter-intuitive negative effect of GPA on earnings for Master students.

Table 5. Determinants of student academic achievement (GPA) by degree, gender and specifications with student employment intensity (OLS-regression).

| | Sample | BA | MA | Male | Female | Sample | BA | MA |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Variables | | GPA | | | | | GPA | |
| | | (1) Combining study and work – dummy | | | | | (1) Intensity | |
| **Source of funding: reference group (self-funded)** | | | | | | | | |
| Government-funded | 0.493*** | | 0.278*** | 0.575*** | 0.432*** | 0.482*** | | 0.254*** |
| | (0.0539) | | (0.0880) | (0.0916) | (0.0664) | (0.0539) | | (0.0884) |
| EGE (1–10 scale) | | 0.430*** | | | | | 0.434*** | |
| | | (0.0545) | | | | | (0.0546) | |
| **Degree: reference group (Bachelor students)** | | | | | | | | |
| Specialist | −0.227*** | | | −0.297** | −0.146 | −0.229*** | | |
| | (0.0820) | | | (0.140) | (0.100) | (0.0818) | | |
| Master | 0.431*** | | | 0.546*** | 0.370*** | 0.457*** | | |
| | (0.0656) | | | (0.120) | (0.0778) | (0.0664) | | |
| **Student employment: reference group (no work experience)** | | | | | | | | |
| Combined study and work | −0.0279 | −0.0472 | −0.0626 | −0.121 | 0.0133 | | | |
| | (0.0591) | (0.0866) | (0.0925) | (0.105) | (0.0704) | | | |
| **Student employment intensity: reference group (no work experience)** | | | | | | | | |
| Full-time | | | | | | −0.0515 | −0.0355 | −0.0131 |
| | | | | | | (0.0675) | (0.130) | (0.0966) |
| Part-time | | | | | | 0.131* | 0.107 | 0.173 |
| | | | | | | (0.0682) | (0.101) | (0.105) |
| Irregular | | | | | | 0.00772 | 0.0209 | 0.115 |
| | | | | | | (0.0684) | (0.0992) | (0.108) |
| **Gender: reference group (female)** | | | | | | | | |
| Male | −0.309*** | −0.153* | −0.228*** | | | −0.309*** | −0.149* | −0.232*** |
| | (0.0469) | (0.0862) | (0.0600) | | | (0.0468) | (0.0865) | (0.0598) |
| **Field of study: reference group (humanities)** | | | | | | | | |
| Mathematics and electronics | −0.526*** | | 0.634*** | −0.764** | −0.253 | −0.515*** | | 0.632*** |
| | (0.168) | | (0.205) | (0.324) | (0.209) | (0.168) | | (0.204) |
| Business and management | −0.471*** | 0.212 | −0.376** | −0.752** | −0.365** | −0.472*** | 0.234 | −0.361** |
| | (0.150) | (0.495) | (0.147) | (0.306) | (0.167) | (0.149) | (0.496) | (0.147) |
| Other programmes | −0.00307 | 0.741 | 0.252 | −0.120 | 0.0191 | 0.00423 | 0.788 | 0.248 |
| | (0.169) | (0.502) | (0.180) | (0.345) | (0.188) | (0.168) | (0.504) | (0.179) |
| Media communications, design | 0.181 | 1.064** | −0.0478 | −0.325 | 0.266 | 0.203 | 1.114** | −0.0257 |
| | (0.156) | (0.495) | (0.172) | (0.336) | (0.171) | (0.155) | (0.497) | (0.172) |

(*Continued*)

**Table 5.** (Continued).

| | Sample (1) | BA (2) | MA (3) | Male (4) | Female (5) | Sample (6) | BA (7) | MA (8) |
|---|---|---|---|---|---|---|---|---|
| Computer science | −0.223 | 0.218 | 0.0052 | −0.358 | −0.287 | −0.224 | 0.225 | 0.0109 |
| | (0.178) | (0.512) | (0.194) | (0.332) | (0.225) | (0.178) | (0.512) | (0.194) |
| International economics and politics | 0.112 | 0.829* | 0.0784 | −0.225 | 0.193 | 0.106 | 0.863* | 0.0702 |
| | (0.162) | (0.497) | (0.173) | (0.333) | (0.179) | (0.161) | (0.498) | (0.172) |
| Law | 0.315* | 0.555 | 0.129 | 0.119 | 0.344* | 0.331** | 0.591 | 0.173 |
| | (0.165) | (0.527) | (0.178) | (0.327) | (0.187) | (0.165) | (0.528) | (0.178) |
| Social sciences | −0.334** | 0.464 | −0.264* | −0.465 | −0.295* | −0.339** | 0.497 | −0.268* |
| | (0.151) | (0.493) | (0.151) | (0.317) | (0.167) | (0.151) | (0.494) | (0.150) |
| Economics, statistics, finance | −0.116 | 0.652 | −0.199 | −0.212 | −0.189 | −0.101 | 0.686 | −0.168 |
| | (0.154) | (0.495) | (0.153) | (0.305) | (0.176) | (0.154) | (0.496) | (0.153) |
| Age | −0.0399** | −0.0307 | 0.00990 | −0.0475* | −0.0352* | −0.0352** | −0.0349 | 0.0149 |
| | (0.0163) | (0.0516) | (0.0189) | (0.0278) | (0.0201) | (0.0164) | (0.0517) | (0.0190) |
| Constant | 8.186*** | 4.294*** | 7.477*** | 8.181*** | 8.080*** | 8.038*** | 4.280*** | 7.301*** |
| | (0.411) | (1.325) | (0.510) | (0.695) | (0.506) | (0.413) | (1.319) | (0.516) |
| Observations | 1,462 | 357 | 785 | 538 | 924 | 1462 | 357 | 785 |
| *R*-squared | 0.258 | 0.290 | 0.118 | 0.309 | 0.156 | 0.263 | 0.293 | 0.126 |
| VIF | 3.83 | | | | | | | |
| Breush-Pagan test (chi-2) | 2.32 | | | | | | | |

Standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

There are significant gender differences in academic achievement: predicted academic achievement for male students is considerably lower than for female students. These results provide some evidence that grade inflation is gender-biassed: female students tend to have higher grades. Nevertheless, predicted academic achievement in Master's studies is higher for male students.

The results of USE exam are a reliable predictor of student academic achievement: 10 additional scores in USE exam increases GPA by 0.4 grade points, which is a moderate effect. (Table 5 (2),(7)). However, this issue is endogenous due to the fact that achievement could be subject specific. Nevertheless, we control for subject heterogeneity in GPA in the regression analysis and USE score is mainly based on compulsory exams (Mathematics, Russian language), which considerably decreases potential heterogeneity of academic achievement by subject.

We can conclude that USE is a predictor of both salaries and academic achievement, but the contribution of USE in graduate salaries is much higher by magnitude than the contribution of USE in GPA. This provides indirect evidence that students tend to distribute their efforts between various types of activities apart from studies, including combining study and work.

## Labor market factors, gender, academic achievement and salaries of university graduates

Another way to explain the described phenomenon of the negative impact of high grades on the salaries of Master's students is to look through labour market factors, which may significantly affect salaries. If the negative impact of GPA on earnings for Master's students is not connected with combining study and work, it can be explained by sector of employment. Distribution by sphere of employment can be affected by academic achievement, gender differences and differences in individual preferences. These preferences can be formulated by pragmatic motivation (maximisation of salaries) and hedonistic motivation (prestige, flexibility of employment, other job characteristics).

The distribution of graduates by sphere of employment affects salaries of HSE University graduates, but at the same time this distribution can be the result of academic achievement, segregation and self-selection in the sector of employment. Graduates who *work in education and science have very low salaries and the highest GPA* (Table 6). Graduates *running their own business have highest salaries and lowest GPA* (Table 6). Such sectors as *entrepreneurship and education/ science* are characterised by *negative correlation* between GPA and earnings. Master students are much more likely to be employed in education and science compared to Bachelor students, and at the same time Bachelors are relatively more likely to run their own business (Table 6).

Our study shows that although female students have higher GPA than male students, there is a considerable wage gap: male graduates earn 18% higher salaries than female ones for the whole sample and for BA graduates male wage premium is exceeds 39% (Table 4). The descriptive analysis presented in Table 6 shows that this difference can be partially explained by gender self-selection by sector of employment: female graduates are more likely to be employed in NGOs and Education and Science and are less likely to run their own businesses. Women, who tend to have higher GPA, have more access to the Education and Science sector or NGOs, where GPA is more important criteria for selection, compared to business enterprises. On the contrary, entrepreneurship does not provide specific requirements for academic achievements as it mainly values soft-skills. Male students are more likely to run their own business. However, it is not clear, if selection in the sectors of employment is based on individual preferences, or if there is a horizontal gender segregation, which has led to a female wage penalty.

This evidence shows us that graduate distribution by sector of employment may significantly affect the GPA-earnings relationship and partially explain the negative correlation between GPA and earnings for Master students and gender wage differences. Considering labour market factors makes our model more complex and is useful for a robustness check. In order to explain the differences in returns on academic achievement we considered these factors by degree and gender

**Table 6.** Sample distribution by sector of employment (mean GPA and monthly salary by gender and degree).

| Variable | *N* | Share | Male (%) | Female (%) | Bachelor (%) | Specialist (%) | Master (%) | GPA | Salary (th.rub.) |
|---|---|---|---|---|---|---|---|---|---|
| Sample | 1463 | 100 | 34,2 | 65,7 | 31,5 | 14,8 | 53,7 | 7,5 | 63,6 |
| **Sector of employment** | | | | | | | | | |
| Business enterprises | 924 | 77,3 | 37,5 | 62,6 | 30,4 | 15,5 | 54,1 | 7,5 | 65,5 |
| Public service | 73 | 6,1 | 32,9 | 67,1 | 23,3 | 16,4 | 60,3 | 7,6 | 54,2 |
| NGOs | 43 | 3,6 | 25,6 | **74,4** | 23,3 | 18,6 | 58,1 | 7,6 | 53,0 |
| Education and science | 95 | 8,0 | 35,8 | 64,2 | 12,6 | 8,4 | **79,0** | **8,0** | **50,1** |
| Entrepreneurship | 35 | 2,9 | **57,1** | 42,9 | **37,1** | 11,4 | 51,4 | **6,9** | **100,8** |
| Freelance | 25 | 2,1 | 32,0 | 68,0 | 44,0 | 8,0 | 48,0 | 7,7 | 48,8 |
| Pearson chi-2 | | | | | | 28,1*** | | | |

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

and estimated the regression that includes academic and labour market determinants of academic achievement.

The regression results of the full specification model which includes labour market factors are presented in Table 7. We found that results of the impact of GPA on earnings are robust for Bachelor and Specialist students and for the whole sample, but after the inclusion of the sector of the employment the impact of GPA on salaries is insignificant for Master students (Table 7). Differences in the sector of employment are significant in our model. We used as a reference group graduates employed in the public service sector. Regression results depict that there is a significant wage premium for the whole sample for entrepreneurship (62%) and employment in business enterprises (19%) and a considerable wage penalty for employment in the Education and Science sector for Master students (Table 7). These results have shown that the negative impact of GPA on graduate salaries for Master students is connected with degree differences in the sector of employment, especially for the education and science, entrepreneurship sectors. However, even after the inclusion of the sector of employment, gender differences in pay remain stable: men earn 18% higher salaries and the gender wage gap is much higher for Bachelor students (35–39%).

We also found a wage premium for a Master degree compared to a Bachelor's degree (10%). The returns on an MA degree are particularly high for female graduates (18%) (Table 7). The effect of student employment is robust: combining study and work has a strong positive impact on earnings (24–29%). To check the robustness of our results we included tenure for current employer as an alternative indicator of student employment and work experience accumulation. We found that graduates who started to work for the current employer have a significant wage premium which is equal to the premium for combining study and work. This alternative specification gives the same stable results in terms of the impact of GPA on salaries: a positive effect for Bachelor graduates and insignificant – for Master graduates (Table 7 (2)). We also used specification 3 with the intensity of combining study and work. The regression results confirm the robustness of our results on the impact of GPA on earnings: it is positive for Bachelor and negative for Master students as in the previous specifications (Table 7 (3)). The employment intensity has a significant positive impact on GPA.

The analysis of the reduced specification, where 3% of observations from the top of wage distribution were excluded, significantly decreased the premium for entrepreneurship and gender differences (Table 7 (2)). These results can be explained by the fact that on the top of wage distribution are mainly graduates who run their own business and the majority of them are male.

## Conclusion and discussion of the results

The empirical analysis shows that there are significant differences in the impact of GPA by degree: we achieved heterogeneous results for BA and MA graduates. We found significant gender differences in GPA and salaries. Following these results and the limitations of our study we discuss the results mainly by subgroups, such as BA and MA graduates or male and female students.

Table 7. Results of regression analysis of the impact of GPA on graduate salaries including labour market factors by degree (OLS, full specification, by degree: Bachelor, Master, by gender, combining study and work, tenure, job intensity specifications).

| | Sample (1) | Reduced sample (2) | Bachelor (3) | Master (4) | Male (5) | Female (6) | Sample (7) | Bachelor (8) | Master (9) | Sample (10) | Bachelor (11) | Master (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variables | | | | | Inwage | | | | | | | |
| | | (1) Combining study and work | | | | | | (2) Tenure | | | (3) Intensity | |
| GPA | 0.0147 | 0.00526 | 0.112** | −0.0292 | 0.0358 | 0.00380 | 0.0199 | 0.124*** | −0.0239 | 0.0192 | 0.117*** | −0.0222 |
| | (0.0211) | (0.0183) | (0.0440) | (0.0281) | (0.0341) | (0.0281) | (0.0209) | (0.0435) | (0.0280) | (0.0207) | (0.0427) | (0.0278) |
| **Degree: reference group (Bachelor students)** | | | | | | | | | | | | |
| Specialist | −0.0102 | 0.0105 | | | −0.192* | 0.0917 | −0.0399 | | −0.106 | 0.00200 | | |
| | (0.0654) | (0.0569) | | | (0.112) | (0.0824) | (0.0645) | | (0.0654) | (0.0642) | | |
| Master | 0.102** | 0.114** | | | −0.0409 | 0.179*** | 0.0608 | | | 0.0587 | | |
| | (0.0516) | (0.0449) | | | (0.0938) | (0.0638) | (0.0515) | | | (0.0514) | | |
| **Source of funding: reference group (self-funded)** | | | | | | | | | | | | |
| Government-funded | −0.0223 | −0.00365 | −0.0114 | −0.123* | 0.00127 | −0.0193 | 0.00494 | 0.0201 | | −0.0105 | −0.00824 | −0.102 |
| | (0.0434) | (0.0380) | (0.0757) | (0.0657) | (0.0699) | (0.0570) | (0.0427) | (0.0737) | | (0.0427) | (0.0734) | (0.0652) |
| **Student employment: reference group (no work experience)** | | | | | | | | | | | | |
| Combining study and work | 0.268*** | 0.240*** | 0.247*** | 0.299*** | 0.166* | 0.288*** | | | | | | |
| | (0.0519) | (0.0450) | (0.0885) | (0.0761) | (0.0957) | (0.0620) | | | | | | |
| **Job tenure: reference group (1–3 months before graduation)** | | | | | | | | | | | | |
| More than 6 months before graduation | | | | | | | 0.277*** | 0.373*** | 0.206*** | | | |
| | | | | | | | (0.0397) | (0.0800) | (0.0520) | | | |
| 4–6 months before graduation | | | | | | | 0.154** | 0.203 | 0.0635 | | | |
| | | | | | | | (0.0625) | (0.152) | (0.0752) | | | |
| 1–3 months after graduation | | | | | | | 0.0719 | 0.132 | −0.00568 | | | |
| | | | | | | | (0.0540) | (0.102) | (0.0706) | | | |
| 4–5 months after graduation | | | | | | | −0.0118 | −0.0301 | 0.0429 | | | |
| | | | | | | | (0.0617) | (0.100) | (0.0907) | | | |
| **Student employment intensity: reference group (no work experience)** | | | | | | | | | | | | |
| Full-time | | | | | | | | | | 0.388*** | 0.475*** | 0.372*** |
| | | | | | | | | | | (0.0556) | (0.107) | (0.0774) |
| Part-time | | | | | | | | | | 0.243*** | 0.271*** | 0.196** |
| | | | | | | | | | | (0.0559) | (0.0942) | (0.0837) |
| Irregular | | | | | | | | | | 0.115* | 0.0697 | 0.191** |
| | | | | | | | | | | (0.0600) | (0.0998) | (0.0888) |
| **Sector of employment** | | | | | | | | | | | | |
| Business enterprises | 0.190*** | 0.166*** | 0.0819 | 0.257*** | 0.0849 | 0.219*** | 0.178** | 0.0984 | 0.254*** | 0.201*** | 0.113 | 0.265*** |
| | (0.0707) | (0.0606) | (0.149) | (0.0871) | (0.132) | (0.0843) | (0.0702) | (0.146) | (0.0875) | (0.0695) | (0.145) | (0.0860) |
| NGOs | 0.0834 | 0.0694 | 0.167 | 0.0865 | −0.0207 | 0.132 | 0.0508 | 0.136 | 0.0885 | 0.113 | 0.179 | 0.124 |
| | (0.108) | (0.0921) | (0.239) | (0.133) | (0.224) | (0.122) | (0.107) | (0.234) | (0.133) | (0.106) | (0.232) | (0.132) |
| Education and science | −0.346*** | −0.125 | −0.0862 | −0.357*** | −0.443*** | −0.331*** | −0.372*** | −0.0544 | −0.354*** | −0.312*** | −0.0361 | −0.316*** |
| | (0.0914) | (0.0813) | (0.245) | (0.105) | (0.169) | (0.110) | (0.0906) | (0.239) | (0.106) | (0.0900) | (0.238) | (0.104) |

(*Continued*)

Table 7. (Continued).

| | Sample (1) | Reduced sample (2) | Bachelor (3) | Master (4) | Male (5) | Female (6) | Sample (7) | Bachelor (8) | Master (9) | Sample (10) | Bachelor (11) | Master (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entrepreneurship | 0.628*** | 0.273* | 0.454* | 0.749*** | 0.466** | 0.880*** | 0.609*** | 0.472** | 0.784*** | 0.687*** | 0.597** | 0.808*** |
| | (0.139) | (0.146) | (0.243) | (0.189) | (0.196) | (0.249) | (0.136) | (0.236) | (0.187) | (0.137) | (0.239) | (0.187) |
| Freelance | −0.0901 | −0.160 | −0.599** | 0.261 | 0.315 | −0.437** | −0.208 | −0.754*** | 0.223 | −0.0175 | −0.525** | 0.353* |
| | (0.159) | (0.147) | (0.274) | (0.200) | (0.251) | (0.212) | (0.156) | (0.263) | (0.199) | (0.157) | (0.266) | (0.199) |
| **Job matching: reference group (job does not correspond with field of study)** | | | | | | | | | | | | |
| Job correspond with field of study | 0.0368 | 0.0277 | −0.00670 | 0.0928 | 0.0298 | 0.0435 | 0.0671 | 0.0341 | 0.114* | 0.0444 | −0.0121 | 0.104 |
| | (0.0475) | (0.0417) | (0.0823) | (0.0642) | (0.0841) | (0.0581) | (0.0464) | (0.0810) | (0.0634) | (0.0467) | (0.0798) | (0.0635) |
| Age | 0.0208 | 0.0230** | 0.0188 | 0.0184 | 0.0279 | 0.0138 | 0.0152 | 0.00470 | 0.0152 | 0.0137 | 0.00707 | 0.0108 |
| | (0.0130) | (0.0113) | (0.0375) | (0.0147) | (0.0207) | (0.0172) | (0.0128) | (0.0367) | (0.0147) | (0.0128) | (0.0364) | (0.0147) |
| **Gender: reference group (female)** | | | | | | | | | | | | |
| Gender | 0.180*** | 0.144*** | 0.390*** | 0.115*** | | | 0.174*** | 0.354*** | 0.104** | 0.181*** | 0.354*** | 0.115*** |
| | (0.0362) | (0.0317) | (0.0769) | (0.0442) | | | (0.0356) | (0.0751) | (0.0440) | (0.0355) | (0.0750) | (0.0437) |
| **Field of study: reference group (humanities)** | | | | | | | | | | | | |
| Mathematics and electronics | −0.255* | −0.249** | −0.195 | −0.172 | −0.187 | −0.280 | −0.311** | | −0.219 | −0.255* | −0.141 | −0.156 |
| | (0.134) | (0.120) | (0.256) | (0.160) | (0.239) | (0.177) | (0.132) | | (0.159) | (0.131) | (0.248) | (0.158) |
| Business and management | 0.0426 | 0.0778 | 0.0391 | 0.0459 | 0.0591 | 0.0240 | −0.0162 | 0.182 | 0.00278 | 0.0326 | 0.106 | 0.0382 |
| | (0.120) | (0.107) | (0.234) | (0.117) | (0.226) | (0.141) | (0.117) | (0.171) | (0.117) | (0.117) | (0.227) | (0.116) |
| Other programmes | −0.189 | −0.0696 | −0.182 | −0.148 | −0.326 | −0.166 | −0.160 | −0.00638 | −0.100 | −0.159 | −0.0217 | −0.150 |
| | (0.135) | (0.122) | (0.248) | (0.142) | (0.252) | (0.160) | (0.133) | (0.191) | (0.142) | (0.133) | (0.244) | (0.140) |
| Media communications, design | −0.120 | −0.0949 | −0.0558 | −0.114 | 0.0942 | −0.149 | −0.177 | −0.0172 | −0.137 | −0.140 | −0.0355 | −0.124 |
| | (0.125) | (0.112) | (0.227) | (0.139) | (0.253) | (0.145) | (0.123) | (0.172) | (0.137) | (0.123) | (0.220) | (0.137) |
| Computer science | 0.0450 | 0.117 | −0.0737 | 0.0934 | 0.0908 | −0.0726 | −0.0294 | 0.00523 | 0.0359 | 0.0491 | 0.00321 | 0.0889 |
| | (0.140) | (0.125) | (0.246) | (0.153) | (0.247) | (0.180) | (0.138) | (0.191) | (0.151) | (0.138) | (0.240) | (0.151) |
| International economics and politics | −0.0752 | −0.0273 | −0.248 | 0.124 | −0.260 | 0.0117 | −0.121 | −0.116 | 0.0982 | −0.0364 | −0.114 | 0.151 |
| | (0.132) | (0.118) | (0.235) | (0.141) | (0.250) | (0.155) | (0.129) | (0.187) | (0.139) | (0.130) | (0.230) | (0.139) |
| Law | −0.0645 | −0.0598 | | −0.0796 | 0.0417 | −0.139 | −0.136 | 0.158 | −0.127 | −0.111 | | −0.125 |
| | (0.131) | (0.117) | | (0.138) | (0.244) | (0.155) | (0.129) | (0.257) | (0.137) | (0.129) | | (0.137) |
| Social sciences | −0.148 | −0.118 | −0.0408 | −0.155 | −0.202 | −0.136 | −0.183 | 0.120 | −0.182 | −0.129 | 0.0528 | −0.139 |
| | (0.120) | (0.108) | (0.225) | (0.119) | (0.231) | (0.140) | (0.118) | (0.167) | (0.118) | (0.118) | (0.219) | (0.117) |
| Economics, statistics, finance | 0.0768 | 0.0984 | 0.232 | 0.00717 | 0.0756 | 0.0923 | 0.0355 | 0.320* | −0.00837 | 0.0513 | 0.272 | −0.0143 |
| | (0.121) | (0.109) | (0.230) | (0.119) | (0.223) | (0.146) | (0.119) | (0.170) | (0.118) | (0.119) | (0.223) | (0.118) |
| **Year of survey (2014)** | | | | | | | | | | | | |
| 2015 | 0.0583* | 0.0619** | 0.0268 | 0.0777* | 0.0312 | 0.0852** | 0.0616* | 0.0446 | 0.0736* | 0.0481 | 0.0276 | 0.0533 |
| | (0.0340) | (0.0298) | (0.0699) | (0.0417) | (0.0569) | (0.0426) | (0.0334) | (0.0682) | (0.0414) | (0.0334) | (0.0678) | (0.0416) |
| Constant | 10.04*** | 10.08*** | 9.433*** | 10.52*** | 10.14*** | 10.26*** | 10.01*** | 9.303*** | 10.43*** | 9.913*** | 9.307*** | 10.36*** |
| | (0.388) | (0.330) | (1.009) | (0.478) | (0.610) | (0.503) | (0.382) | (0.982) | (0.477) | (0.383) | (0.976) | (0.479) |
| Observations | 924 | 885 | 258 | 538 | 349 | 575 | 919 | 257 | 534 | 924 | 258 | 538 |
| *R*-squared | 0.232 | 0.214 | 0.268 | 0.284 | 0.222 | 0.235 | 0.253 | 0.316 | 0.287 | 0.262 | 0.318 | 0.306 |
| VIF | 3.11 | | | | | | | | | | | |
| Breush-Pagan test (chi-2) | 1.68 | | | | | | | | | | | |

Standard errors in parentheses: ***$p < 0.01$,**$p < 0.05$, *$p < 0.1$.

We found a positive impact of GPA on salaries of Bachelor programmes' graduates (9–12% for an additional GPA point). The results of our analysis show that GPA is a good proxy for BA student' abilities and the BA programme grading system is coherent to labour market requirements. The study depicts that university entrance exam grade (USE, which is Russian analogue of SAT) is a good predictor of future success of BA graduates both in study and in the labour market. Students who achieved higher USE grades after high school have a higher GPA in university, although the magnitude of the effect is moderate. BA graduates who achieved higher USE grades, before entrance to the university, have higher salaries after graduation. An additional 10 points of 100-point scale of USE exam increases salaries by 10%. The positive impact of GPA on salaries of BA graduates can provide arguments in support of both human capital theory and job market signalling theory.

The equal contribution of USE and GPA grades in salaries of BA graduates shows that we overestimate the productivity of higher education in terms of knowledge accumulation. Either most of human capital has been accumulated before entrance to university at high school (and this provides support for the human capital explanation of the GPA-earnings relationship) or higher education mainly works as a tool to reveal abilities. Students with higher abilities have lower costs in achieving a better GPA, which supports the job market signalling theory. The significance of prior achievement (USE grade) for labour market outcomes and the correlation between USE grade and GPA shows that the inequality in earnings of graduates could be initially formed at school by the different quality of the school and the different levels of cultural capital of families. This statement was also proved by results of other empirical studies: there is evidence, that in Russia, the socio-economic status of families and family cultural capital increases the probability of having a higher USE score and entering a prestigious university (Prakhov 2016). GPA itself can be a mediating factor to other prior achievement and social and family background. After school, inequality is fixed by higher education and transmits to wage inequality in the labour market.

However, relation between prior achievement scores, GPA and labour market outcomes can be potentially endogenous due to the fact, that achievement may be subject specific. By controlling for heterogeneity in academic achievement (GPA) by subject fields in our regression analysis, we deal with this problem for GPA scores. Nevertheless, USE scores may also be potentially subject-specific. High school graduates pass USE exam, which contains of three subjects including Mathematics, Russian language and one specific subject, which is chosen by high school graduates in accordance with expected university major. Due to the fact, that two out of three subjects are compulsory for everyone and we use average USE score for three subjects, USE is a reliable measure of prior academic achievement and despite some heterogeneity caused by subject specifics, it is unlikely to bias our results.

The relatively low magnitude of the effect of USE grade on GPA and the higher magnitude of the impact of prior achievement on labour market outcomes of BA graduates provide evidence that during their studies, individuals distribute their time and efforts between studies and various other activities, for instance, combining study and work. It puts some limitations on using the GPA as an exclusive indicator of student human capital and abilities. During their studies a lot of students may invest in their human capital by the accumulation of work experience, or from the perspective of job signalling theory, more talented students may have an opportunity to receive an additional signal in the labour market by combining study and work. Our previous research has shown that more talented students are more likely to combine study and work and at the same time they are more moderate in the intensity of student employment (Roshchin and Rudakov 2017).

The impact of GPA on earnings of MA programmes' graduates is negative (7–8% wage penalty for an additional GPA point). If sectoral differences in employment are controlled for the impact of GPA on earnings of Master's graduates is insignificant. The negative effect of GPA on graduates of Master's programmes can be explained by the dispersion of student's efforts between study and work, grade and credential inflation, the autonomy of the labour market and education sphere in

terms of rewards for different skills, distribution by sectors of employment as well as by gender differences.

This study found that combining study and work and the intensity of employment positively affect graduate salaries (20–40% wage premium for work experience before graduation). Master's students are more likely to combine study and work and tend to work more hours compared to BA students. We found no evidence that student employment affects GPA, even for those who combined studies with a full-time job. The study provides evidence that the Russian labour market has not adjusted to the transition from Soviet 5-year Specialist system to Bologna BA-MA system. Employers value Bachelor or Specialist degrees with work experience higher than Master's degrees. The study shows that Master education is treated by students as part-time studies which they combine with a full-time job. Relatively low workload compared to BA studies and grade inflation in Master programmes has led to the fact that even full-time employment does not affect academic achievement. Work experience is a more valuable signal in the labour market than an MA degree, which is valued by employers only if it is complemented by work experience.

The insignificance of GPA as a predictor of salaries after graduation can be explained by the educational credentialing theory and credential inflation. Rising employer's requirements have led to the necessity of a degree for attaining a white-collar job. These conditions contribute to the massification of higher education and make students accumulate more educational credentials, as advanced as possible. A necessity of MA degree for maximising of competitive advantages in the labour market together with the necessity of the work experience, make the students with high abilities distribute their time and efforts between study and work. Relatively low workload in MA programmes leads to grade inflation in the Master studies and lack of returns of higher academic achievement on salaries.

This effect can be strengthened by the fact that university quality is stronger signal than academic achievement, which is consistent with study of Hershbein (2013). Employers do not differentiate graduates of selective universities according to their academic performance using a strategy of statistical discrimination on the basis of university quality. It creates negative motivation for graduates of selective universities (such as HSE University) who, instead of putting emphasis on studies, mainly concentrate on combining study and work. This issue is of particular relevance for MA students, who are much more likely to combine study and work, compared to BA students.

A possible explanation for the insignificance or negative impact of academic achievement on the wages of recent MA graduates can be proposed by the concept of conventions of coordination and the composition of economic arrangements (Boltansky and Thevenot 2006), which implies the relative autonomy of education and the labour market in terms of results or ability assessment. It means that the education system and the labour market reward different knowledge and skills. For instance, the education system assesses students' abilities to study and their efforts, but it is unable to estimate student soft-skills such as general communication skills, leadership, emotional stability, ability to cooperate and teamwork. The formal knowledge acquired during study at university is not as valuable for employers (especially in starting positions) as for university professors. Employers may value soft-skills that are not measured by GPA. These differences in the value of skills in the education system and the labour market can make the GPA-earnings relationship insignificant.

Another important issue is the significant gender differences in salaries and academic achievement. Although female students have higher academic achievement, there is a considerable gender wage gap: male graduate's earnings are 18–30% higher than the earnings of female graduates. The empirical part of the study has shown that gender differences in pay can be to a high extent explained by gender distribution by sector of employment. These results are consistent with findings for the US and European countries (Joy 2003; Kunze 2003; Garcia-Aracil 2007). Women are more likely to work in relatively low-paid education and science, public service and NGOs sectors, while men are more likely to work in the better-paid corporate

sector or run their own businesses, which bring a considerable wage premium. High academic achievement and an advanced degree are among the main requirements for the education, public service and NGOs sectors, which as a result are occupied by female graduates with the highest GPA. Jobs in the corporate sector and particularly entrepreneurship do not imply specific requirements for academic achievement and, on the contrary, value soft-skills such as leadership, independence, team-work, which are not directly reflected in academic achievement. Male graduates are over-represented in such jobs, which leads to the higher salaries of male graduates despite their lower GPA.

Another explanation is that there can be a hedonistic job selection and compensating wage differentials: MA students and female students with high GPA can choose jobs that are attractive due to the creative and flexible character of work with low starting salary but high life-long earnings which increase with the accumulation of work experience (for instance researchers in universities, public service, NGOs). Our analysis is limited to the early stages of careers and the positive effect of academic achievement on wages of MA graduates and women, who decided to work in education, public service and NGOs may appear in the long-run, when they grow to positions where the knowledge and academic competencies acquired during MA studies can be applied.

We believe that this study contributes to the discussion of the coherence between educational and labour market outcomes and how it may differ by gender, degree, quality of the university, sector of employment and the institutional peculiarities of different educational systems. The case of Russia is of particular relevance we can analyse how academic achievement and student employment can be rewarded in massified higher education systems, which experienced serious institutional changes.

## Note

1. National Research University Higher School of Economics – is the official name of the institution. The name 'HSE University' is a widely used unofficial name.

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## Appendix

Table A1. The comparison of population of HSE graduates and CIM HSE sample (GPA, age, salaries).

| | HSE University Administrative data/data of Ministry of Education and Science of Russian Federation | CIM HSE (initial sample) | CIM HSE (final sample) |
|---|---|---|---|
| GPA (1–10) | 7,4 | 7,6 | 7,5 |
| Average age (years) | 24,0 | 24,3 | 24 |
| Average salary (thousand rubles) | 65,3 | 63,6 | 63,6 |

Table A2. The comparison of population of HSE graduates and CIM HSE sample (categorical variables).

| | HSE University Administrative data/data of Ministry of Education and Science of Russian Federation | | CIM HSE (initial sample) | | CIM HSE (final sample) | |
|---|---|---|---|---|---|---|
| | *N* | % | *N* | % | *N* | % |
| All graduates | 7306 | | 1812 | | 1463 | |
| Response rate | | | | 24,8% | | 20,0% |
| By degree | | | | | | |
| Undergraduate (Bachelor) | 3810 | 52,1% | 735 | 40,6% | 461 | 31,5% |
| Graduate (Masters) | 2777 | 38,0% | 849 | 46,9% | 786 | 53,7% |
| Specialists | 719 | 9,8% | 228 | 12,6% | 216 | 14,8% |
| By gender | | | | | | |
| Male | 3064 | 41,9% | 666 | 36,8% | 539 | 36,8% |
| Female | 4242 | 58,1% | 1446 | 79,8% | 924 | 63,2% |

Table A3. Correlation matrix of regressors.

| | GPA | Degree | Funding | USE | Tenure | Study and work | Matching | Gender | Age | Field of study | Industry | Sector | Position |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GPA | 1,00 | | | | | | | | | | | | |
| Degree | 0,21 | 1,00 | | | | | | | | | | | |
| Funding | **0,30** | 0,31 | 1,00 | | | | | | | | | | |
| USE | **0,36** | N/A | 0,42 | 1,00 | | | | | | | | | |
| Tenure | −0,02 | **−0,27** | −0,01 | −0,04 | 1,00 | | | | | | | | |
| Study and work | 0,07 | 0,16 | 0,12 | 0,12 | **0,26** | 1,00 | | | | | | | |
| Matching | 0,12 | 0,13 | 0,04 | 0,08 | −0,06 | 0,12 | 1,00 | | | | | | |
| Gender | −0,24 | 0,01 | −0,10 | −0,03 | −0,08 | 0,00 | 0,02 | 1,00 | | | | | |
| Age | 0,06 | **0,61** | 0,07 | −0,10 | **−0,21** | 0,12 | 0,05 | 0,05 | 1,00 | | | | |
| Field of study | 0,12 | −0,01 | −0,02 | 0,14 | 0,04 | −0,02 | −0,03 | −0,04 | −0,04 | 1,00 | | | |
| Industry | 0,02 | −0,03 | 0,03 | −0,15 | 0,12 | −0,06 | −0,04 | −0,07 | 0,03 | 0,04 | 1,00 | | |
| Sector | 0,06 | 0,06 | 0,08 | −0,01 | −0,02 | −0,05 | 0,02 | 0,01 | 0,07 | −0,04 | 0,12 | 1,00 | |
| Position | −0,13 | 0,11 | −0,08 | −0,12 | −0,17 | 0,06 | 0,02 | 0,11 | 0,15 | −0,02 | 0,01 | 0,17 | 1,00 |

[a]p < 0.01, **$p$ < 0.05, *$p$ < 0.1.