Factors Influencing the Earnings Expectations among Macedonian Students: A Comparative Perspective with the EU Students

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Abstract

The aim of this paper is to assess the earnings expectations of Macedonian students and the main factors that shape their expectations. Previous research has shown that earnings expectation is a major determinant that influences a decision on schooling (Williams and Gordon, 1981; Betts, 1996; Wolter and Zbinden, 2001). Given that the main pathway to developing individual human capital is schooling, learning about factors that affect individual's decision on whether to acquire more education can contribute towards better educational policy. We employ similar empirical approach as Brunello et al. (2001, 2004). We use available information to regress: i) expected future earnings right after university graduation and ii) expected future earnings 10 years after graduation, on a set of variables: characteristics of the individual, socio-economic background,

field of study, year of study, academic performance, sources of information for future earnings, etc.

Our findings show that expected earnings are significantly correlated with the education of the father, year of study, sources of information on earnings in the labor market, gender, ethnicity, having a regular job during studies, perceived employability, field of study, and the country of future employment. In other words, Macedonian students form their earnings expectations in a similar vein as their European counterparts.

Keywords: demand for schooling, earnings expectations, higher education

JEL classification: I21, I23, J24

1 Introduction

Since 2003 the Macedonian higher education system has undergone several important reforms, mainly related to the implementation of the Bologna Declaration which was signed in 2003. The actual implementation of the Bologna-related reforms started in 2008 when a new Law on Higher education was adopted reflecting the Bologna declaration. The Law was developed around the following premises: strengthening the quality assurance system; internationalization of universities, their programs, and students; involvement of students and employers into the decision-making bodies of universities; membership of the national bodies for quality assurance in the European Association for Quality Assurance in Higher Education (ENQA), etc. In addition, the two-cycle system was replaced with a three-cycle system. However, some state universities faced difficulties in conforming to the new higher education environment and requirements, such that some of them still offer 4-years undergraduate programs or even 5 or 6 years of undergraduate programs in the field of regulated professions (Vujacic et al., 2013).

Recent years are characterized by the expansion of provision and subsidies in the Macedonian tertiary education system. Two new state universities were established, and dispersed studies were organized across the country (as co-branches of state universities), improving the access to tertiary education for most youth. In addition, the tuition fees at state universities were reduced (and subsidies increased). These factors have contributed to a large increase in university enrollments, with the gross enrollment rate growing from 24 percent in 2005/06 to 31 percent in 2011/12 (State Statistical Office, 2013). Between 2000 and 2011, the number of graduates tripled (State Statistical Office, 2012). However, the increased relative supply of workers with tertiary education brought about declining returns to education, both in terms of employment and wages of the graduates (Mojsoska-Blazevski and Ristovska, 2012).

In the academic year 2013/14, there were 16 universities, 5 of which were state universities. The majority of students were enrolled at state universities (88.5 percent). The expansion of the state universities contributed towards an increase in their share in total number of students from 82 percent in 2010 to 87 percent in 2013/2014.

Benefits from getting a university degree in labor economics are measured through returns to education: earnings returns and returns in terms of probability for getting a job. In Macedonia, there are relatively high returns to education: individuals who have completed 4-year secondary school have, on average, 37 percent higher earnings than those who have completed only primary education, while getting a university degree increases earnings by 106 percent compared to having just primary education (Mojsoska, 2006). Similarly, the probability of employment increases with education, in such a way that workers who have completed tertiary education in 2011 had 2.5 times higher employment rates than individuals who have completed only primary education. Hence, there are large incentives for young individuals to demand more education. However, so far no study has been done in Macedonia on the factors driving earnings expectations of students and hence their demand for education. For instance,

there is no evidence on whether students are realistic about the market value of their labor after graduating from university. What is their expectation on potential gender-earnings gap? Which characteristics of students and their social environment influence the expected earnings?

While the literature on returns to education is very broad, few studies have attempted to answer these questions. Most of the studies of earnings expectations are related to US and European experience, with no similar studies conducted either for the transition countries or the Western Balkans countries. In this respect, the aim of this paper is to provide first insight into the earnings expectations of Macedonian students after graduation from university and to fill in the gap in the empirical literature.

This paper is organized as follows. Section 2 explores the literature related to the wage expectations of students, whereas Section 3 discusses data and used methodology. Section 4 presents and discusses results and Section 5 concludes the paper.

2 Literature Review

The decision on whether a person will choose to continue his/her education depends on its' perceived costs and benefits (Mazza and Hartog, 2011). However, there are only few studies that try to explain how expectations are formed and what the major determinants that affect expectations are. Across the scarce studies in this area, the following factors are commonly found to affect student's expectations about future earnings: the socioeconomic background of the student, gender, field of study, academic performance, age of a student, and sources of information (Wolter, 2000; Brunello et al., 2001; Wolter and Zbinden, 2001; Webbink and Hartog, 2004). We proceed by examining each of these factors separately.

Socioeconomic Background

Most studies focus on the parents' education and income as a main socioeconomic factor that influences earnings expectations of students (Williams and Gordon, 1981; Webbink and Hartog, 2004; Delaney et al., 2011). Parental educational background is thought to influence student's expectations on at least two levels: (i) information on earnings from educated parents is of better quality, (ii) students who have well educated parents can rely on their parents' personal networks for finding a job after graduation, and hence have higher earnings (and job) expectations. Delaney et al. (2011) using data from seven Irish universities found out that parental education has a significant and positive effect on short-run and long-run earnings expectations. This however is not in line with the results of work by Betts (1996), Wolter (2000) and Wolter and Zbinden (2001). In particular, Betts (1996) conducting a survey among 1,000 undergraduates from the University of California found no strong effect between parental education and students' earnings estimation. This is confirmed by Wolter (2000) and Wolter and Zbinden (2001). Wolter (2000) used a different approach: imagining different scenarios students were asked to predict their own future earnings, as well as the earnings of an average person with similar characteristics. In this study, as well as in the study of Wolter and Zbinden (2001), parental education proved to be insignificant.

Different results appear when researchers examine the influence of the mother's and father's education on the students' earnings expectations separately. Brunello et al. (2001), in the study based on a survey conducted in 50 universities across ten European countries, found that having a mother with a university degree leads to a 3.3 percent increase in expected earnings right after graduation, and almost 4 percent, 10 years after entering labor market. In the same study the father's education was found not to be statistically significant. This was confirmed in another study of Brunello et al. (2004).

The results are consistent when researchers examine the influence of parental income on students' earnings expectations: earnings expectations are higher

when parental income is higher (Betts, 1996; Varga, 2001; Webbink and Hartog, 2004; Jerrim, 2008). Jerrim (2008) and Webbink and Hartog (2004) agree that students from high-income families expect higher earnings in order to maintain high living standard and that their expectations are based on the income of the people around them. Webbink and Hartog (2004) argued that this result may be an important factor in explaining increased participation in extended education for students from wealthy backgrounds.

Gender

Researchers in many academic disciplines recognize the existence of an earnings gap between males and females (Filippin and Ichino, 2003; Chevalier 2004; Avlijaš et al., 2013) which is thought to affect earnings expectations for different genders: knowing the actual gender pay gap, students expect lower earnings for females. According to Chevalier (2004), women are still paid between 20 percent and 40 percent less than men despite the introduction of equal opportunity legislations. He argued that part of the existence of the gender earnings gap is explained by gender differences in educational and career choices, as well as the gender differences in expectations, but there is still a large part that is left unexplained. A study by Avlijaš et al. (2013) shows that the gender earnings gap in Macedonia in the period 2008-2011, on average, was 13.4 percent. When the gap is adjusted for the differences in personal characteristics, it increases to 17.5 percent, meaning that female workers have better labor market characteristics than their male counterparts.

According to several studies, women do expect to earn less than men (Carvajal et al., 2000; Wolter, 2000; Filippin and Ichino, 2003; Botelho and Pinto, 2004; Webbink and Hartog, 2004; Mazza and Hartog, 2011). Examining whether earnings expectations of students from Florida International University are realistic, Carvajal et al. (2000) found that female students expect and earn significantly less than male students. This is confirmed by Webbink and Hartog

(2004) when using Dutch panel data. These authors examined the accuracy of students' prediction of their future earnings and found that female students expect to earn 5 percent less than males. This expectation of female students is very close to the actual gender earnings gap in Netherlands of 6 percent in favor of men, as assessed by Webbink and Hartog (2004). Botelho and Pinto (2004) and Filippin and Ichino (2003) agree that even though females expect lower earnings than males, they prove to be more realistic in their expectations.

Age

Most of the reviewed studies have examined the influence of students' age over their earnings expectations (Dominitz and Manski, 1994; Betts, 1996; Brunello et al., 2001; Wolter and Zbinden, 2001; Botelho and Pinto, 2004; Brunello et al., 2004). Dominitz and Manski (1994) found that earnings expectations are quite similar between junior and senior students. Opposite to this, several authors (Betts, 1996; Brunello et al., 2001; Wolter and Zbinden, 2001; Botelho and Pinto, 2004; Brunello et al., 2004; Borrego and Medina, 2010) agree that senior students expect lower earnings than junior students. Brunello et al. (2004) provide three possible explanations for such a result: (i) formation of earnings expectations improves as students approach graduation and become more realistic about their future earnings, (ii) senior students take questionnaires more seriously and/or (iii) students are taking future positive inflation and productivity growth into consideration.

Field of Study

Webbink and Hartog (2004) found that students in law, economics, health and technical studies expect to earn more than their colleagues from social sciences, while students in languages expect the same earnings as students in social studies. On the other hand, Brunello et al. (2001) found that students in Science

and Engineering have higher expectations than students in Humanities or other disciplines, which is also confirmed by the studies of Jerrim (2008) and Borrego and Medina (2010). According to Jerrim (2008), the higher (and unrealistic) earnings expectations of the Science students are reflecting the difficulty of their chosen subject and the respective anticipation of a higher reward.

Academic Performance

The role of ability is in the center of discussion in the schooling behavior literature, but very few studies examined the relationship between ability and earnings expectations. Manski (1993) points out that young people use their ability to form their expectations, and that school choice depends on it. Several authors (Carvajal et al., 2000; Wolter and Zbinden, 2001; Brunello et al., 2004; Jerrim, 2008) include an academic performance variable in order to test if there is any correlation between students' earnings expectations and their performance in college. Academic performance is measured through students' perception of their ability compared to other students. The results are consistent: students who perceived themselves as high performers have higher expected university earnings.

Sources of Information

The source of information about earnings prevalent in the labor market can also affect earnings expectations. Adding this variable into regression, Brunello et al. (2001) and Wolter and Zbinden (2001) found opposite results. The former study found that when information is personal or collected from the daily and weekly press then this variable is significant and positively affects students' earnings expectations. On the other hand, the latter study finds that students with no specific information on earnings have significantly higher expectations than the rest.

Other Findings

Several authors examined other influences over students' earnings expectations. Anchor et al. (2011) comparing students' expectations in England and Czech Republic found that students who experience higher costs for their studies (in terms of foregone earnings and tuition fees) tend to have higher earnings expectations in order to compensate those costs. McMahon and Wagner (1981) and Jerrim (2008) examined the influence of ethnicity over students' earnings expectations. Both studies find that students from minority backgrounds expect higher starting earnings and tend to be more optimistic about their future earning potential. Epple and Romano (1998) suggest that private schools attract students with higher quality and therefore these students expect higher earnings than their colleagues.

In summary, when deciding on the amount of education to "consume", individuals compare different options and choose the one with the highest return. Therefore, expectations for future earnings are a major determinant that influences schooling decision. The review of the relevant literature revealed the complexity of expectations' formation and that expectations are mostly influenced by the students' personal characteristics (age, gender), their socioeconomic background (education and income of their parents), field of study, academic performance, sources of information on earnings, etc.

3 Methodology and Data

Several authors using different approaches have tried to examine which determinants influence students' earnings expectations (Wolter ans Zbiden, 2001; Brunello et al., 2001, 2004; Webbink and Hartog, 2004; Anchor et al., 2011). Our study is based on the methodology used in the work of Brunello et al. (2001), which is originally based on a method for estimation of private return on

education known as Mincer's method. Mincer (1974) was one of the first authors who applied the concept of human capital for empirical estimation of the returns on education. In the Mincerian equation, a dependent variable is the earnings of an individual, which is presented in a logarithmic form. Brunello et al. (2001) estimated linear regression in which the dependent variable is a logarithm of students' expected earnings regressed on a set of independent variables.

Data used in our study on earnings expectations of Macedonian students were collected through a survey conducted in 11 faculties (schools) belonging to three universities in Macedonia (one state and two private). The share of these three universities in the total enrollments in the universities across Macedonia is 80 percent. Appendix A presents details on the universities participating in the study.

The questionnaire used in the work of Brunello et al. (2001, 2004) was adapted for the purpose of our study, taking into consideration the specific country context and our research questions. We asked students of their earnings expectations under two different scenarios: i) expected monthly net earnings right after university graduation, and ii) expected monthly net earnings 10 years after graduation. The distributed questionnaire was in Macedonian, while here we present the questionnaire in English (see Appendix B).

In order to collect relevant answers about expected earnings after graduation, students got to choose from several intervals to which they thought that their future monthly net earnings belong. We used interval amounts that are commonly used by the State Statistical Office. The ordered variable was then transformed into a continuous variable by calculating the mean from each interval. We then applied linear regression, which is defined as:

$$\ln W_i = \alpha + \beta_i X_i + \varepsilon_i \tag{1}$$

where:

α = constant;

$W_{i,c}$ = expected net earnings of individual I;

β_i = vector of parameters to be estimated;

X_i = vector of parameters, assumed that have an influence on earnings expectations; and

ε_i = error, assumed to be well-behaved.

Table 1 examines variables used in our study, X_i.

The questionnaire was distributed among undergraduate students in the spring semester of the academic year 2012/2013. Different fields of study were selected randomly and students were asked to fill in the questionnaire during the first minutes of a lecture. This method delivered a 100-percent response rate and 496 questionnaires were returned.

In this type of research, there is concern that the so-called anchoring effect might influence the results. Anchoring effect is considered to be one of the most robust psychological phenomena, found in many areas of human judgment and decision making (McElroy and Dowd, 2007). When answering ambiguous questions most people start with available value, and make final adjustment from this value. Anchoring effect occurs when this adjustment is insufficient to compensate for the starting value/answer (Kudryavtsev and Cohen, 2010). However, since the results in the area of earnings expectations are consistent across countries and researchers, we exclude the possibility of anchoring effect in this research.

Tables C1 and C2 in Appendix C present in detail descriptive statistics for the sample. The average age of the students in the sample is around 21 years. At the time of the survey, 59 percent of the students were in their first year of study, while others were in their last year of study. The share of female respondents was slightly higher: 56 percent compared to 44 percent of males. The majority of the respondents (85 percent) reported Macedonian ethnicity, while the others were mainly Albanian and Turkish.

Table 1: *Description of Variables*

	Earnings expectation with a university degree	Continuous variable
	Earnings expectation with a university degree 10 years after graduation	Continuous variable
	Year of study	Dummy 1=juniors; 0=seniors
	Type of school	Dummy 1=private; 0=state
Field of study	Business and Economy	Dummy 1=yes; 0=otherwise
	Engineering	Dummy 1=yes; 0=otherwise
	Mathematics	Dummy 1=yes; 0=otherwise
	Medicine	Dummy 1=yes; 0=otherwise
	Father holding university degree or Master/PhD	Dummy 1=yes; 0=otherwise
	Mother holding university degree or Master/PhD	Dummy 1=yes; 0=otherwise
	Same field as father	Dummy 1=yes; 0=no
	Same field as mother	Dummy 1=yes; 0=no
	Repeaters	Dummy 1=yes; 0=no
	Academic performance	Ordered variable on a scale 1 to 5 1=very good 2=good 3=average 4=poor 5=very poor
	Employment in family business	Dummy 1=yes; 0=no/my family doesn't have household business
	Employability	Ordered variable on a scale 1 to 5 1=very good 2=good 3=average 4=poor 5=very poor
	Expected country of employment	Dummy 1=Macedonia; 0=other country
	Regular job during studies	Dummy 1=yes; 0=no
Information about earnings	W1	Dummy 1=career centre; 0=otherwise
	W2	Dummy 1=daily/weekly press 0=otherwise
	W3	Dummy 1=personal communications 0=otherwise
	W4	Dummy 1=never; 0=otherwise
	Costs	Continuous variable
	Gender	Dummy 1=females; 0=males
	Ethnicity	Dummy 1=Macedonian; 0=other

Less than half (43 percent) of the students were studying in private universities. About 43 percent of the respondents belonged to households where fathers held a university degree or a master/PhD, and 44 percent of the respondents belonged to households where mothers held a university degree or a master/PhD. A small portion of students was enrolled in the same field of study as their parents, 19 percent were in the same field of study as their fathers, while 13 percent were in the same field of study as their mothers. A gender analysis shows that males are more likely to follow academic choices of their fathers (9.6 percent) than academic choices of their mothers (3.6 percent). Students in Macedonia expect their average starting earnings after graduation to be 24,085 denars (approximately 390 euros), and 36,150 denars (588 euros) 10 years after graduation. Students expect that their earnings after 10 years on the job, on average, will be 50 percent higher if they hold a university degree, and 20 percent higher if they have finished only secondary education.

Males have higher earnings expectations than females. After graduation from university, males expect to earn on average 15 percent higher earnings than females. This gap increases to 17 percent after 10 years in the labor market. Have they completed only secondary education, males would have expected to receive 25 percent higher earnings than females immediately after completing the education, but this gap is decreasing to 9 percent after 10 years in the labor market. Data also show that students from Macedonian ethnicity, on average, expect lower earnings than their peers from other ethnicities after graduation from secondary school or university. They expect this gap to decline in 10 years, and even to become reverse for those with completed university education.

Two thirds of the students heard about earnings prospects through personal communication with family, friends, etc., 12 percent were informed by daily/weekly press and 7 percent by university career centers. When asked about chances for finding an appropriate job with completed tertiary education, 39.8 percent of the respondents think that they have good chances of getting an appropriate job after graduation. About 35 percent of females and 27 percent of males think that

they have average chances of finding an appropriate job after graduation, while 19 percent males and 14 percent females think that they have very good chances of finding an appropriate job. A very small share of respondents (9 percent) hold a regular job while studying and they work on average 19 hours per week. About one third of the students expect to work in their family businesses. Two thirds of the students expect to find a job in Macedonia, while 34 percent expect to work outside Macedonia, mostly in Germany.

4 Results

Before we proceed with the estimation of Equation (1) we run a Chow test to check the structural stability of the regression i.e., to see whether the same regression model is appropriate to estimate the relationship between the dependent and the explanatory variables for junior (1st year) and senior (last year) students, given that the findings from other studies point to a difference in the earnings expectations of these two groups of students (see Section 3). Results presented in Appendix E show no structural differences between these two subsets (juniors and seniors) hence we can run the regression jointly. We also run Breusch-Pagan test which is designed to show any linear form of heteroskedasticity. Results presented in Appendix F show that the model does not suffer heteroscedasticity. Moreover, Appendix G confirms the normality of residuals. We therefore proceed by estimating regression (1).

The results from the estimated Equation (1) are presented in Appendix D. Data are presented for the dependent variable: i) earnings expectations after graduation from university (column 1) and ii) earnings expectations 10 years after graduation (column 2). We proceed by interpreting the results and examining factors that significantly influence earnings expectations of Macedonian students.

The coefficient of determination for the first equation is about 22 percent, meaning that 22 percent of the variability in the earnings expectations of students after graduation is explained by the independent variables/regressors.

The coefficient of determination for the second equation is about 26 percent, meaning that 26 percent of the variability in the earnings expectations of students 10 years after graduation is explained by the independent variables/ regressors. Coefficients are jointly significant and coefficients have the expected signs. As Table D1 (Appendix D) shows, following variables are found to have a significant influence on the earnings expectations of students: year of study (juniors vs. seniors), field of study, father's education, sources of information, country of employment, perceived employability, holding a regular job during studies, gender and ethnicity.

In Macedonia, students who belong to households where the father has a university degree or a master/PhD, expect to earn 10 percent more than their peers at the labor market entry and 15.6 percent more 10 years later. In EU countries having a father with a university degree is not statistically significant (for instance, see Brunello et al., 2001). Our study shows that in Macedonia there is no effect of the mother's education on the earnings expectation of students. Furthermore, in Macedonia as in EU, there is no statistically significant correlation between expected earnings and the study in the same field as parents.

We find that female students in Macedonia, as in most European countries, expect to earn less than their male colleagues, 10 percent less if they hold a university degree. This gap increases to 20 percent after 10 years on the job with university degree.

Similar to the findings of several authors from Europe (Brunello et al., 2001; Wolter and Zbinden, 2001; Borrego and Medina, 2010), junior students expect to earn more than senior students. In Macedonia juniors expect to earn 14 percent more than senior students at the labor market entry, and 9.5 percent more 10 years later. Section 3 provides several possible explanations for the greater optimism of the junior students.

When examining the relation between students' earnings expectations and chosen field of study, we found that Medicine students at the entry into the labor

market expect to earn 25 percent less than Engineering students. After 10 years on the job, this percentage slightly decreases to 24 percent. The coefficients for the other fields of study are insignificant. This result is in line with the work of Brunello et al. (2001).

Depending on how students are informed about earnings in their field of study, their earnings expectations might vary. In Macedonia, students who have gathered information on future earnings at the university career centers expect to earn 25 percent more at the beginning of their careers than students who do not have such information. Students who inform themselves from daily or weekly press expect to earn 15 percent more than students with no information on future earnings. These results are opposite to the results from the study of Wolter and Zbinden (2001).

Students from Macedonian ethnicity expect to have 10 percent lower earnings than their colleagues from other ethnicities at the entry into the labor market. Lower expectations of ethnic Macedonians can be related to the policy of equal representation of ethnic minorities (under the Ohrid Framework Agreement), as well as the lower relative supply of workers from ethnic minorities who hold a university degree. Coefficients on the ethnicity after 10 years on the job are not statistically significant. Although Epple and Romano (1998) suggest that students from private universities expect higher future earnings, we have not found a correlation between the type of school (private vs. state) and students' earnings expectations.

Holding a regular job while studying can influence students' earnings expectations in at least two ways: (i) students who work during their studies have insideinformation about earnings and the labor market and (ii) they take their work experience into consideration and therefore expect higher earnings. In Macedonia, students who hold a regular job during their studies expect to earn 13.7 percent more than students who do not work.

Because of the evidenced brain drain in Macedonia, we asked students about the country of their expected employment. Students who expect to work in Macedonia have 17 percent and 22 percent lower earnings expectations than students who expect to work abroad at the entry into labor market and 10 years after graduation, respectively.

Opposite to the results from the work of Anchor et al. (2011) we have not found any correlation between costs of studies and students earnings expectations.

5 Conclusion

The aim of this paper was to fill the gap in the empirical literature on the factors influencing earnings expectations of Macedonian students. In addition, we have put the results into comparative perspective with the EU students.

We employed similar empirical approach as the one used by Brunello et al. (2001, 2004) in which we regress the i) expected future earnings right after university graduation and ii) expected future earnings 10 years after graduation, on a set of variables: characteristics of the individual, socio-economic background, field of study, year of study, academic performance, sources of information for future earnings. We collected data through a questionnaire administered to junior and senior students at three universities (one state university and two private ones) in Macedonia.

Our findings show that Macedonian students form their earnings expectations in a similar vein as their European counterparts. In other words, their expected university earnings are significantly correlated with their father's education, their year of study, sources of information on earnings in the labor market, gender, ethnicity, holding a regular job during studies, perceived employability, field of study, and country of future employment.

The results show that students who have a more educated father expect to earn more than their peers, whereas the mother's education does not exert any significant effect on the earnings expectations. As in most studies, we find that females expect to earn less, with the expected gap increasing through time. Junior students are more optimistic about their earnings potential relative to their senior peers. Students who are more informed about the earnings prospects tend to have higher expectations for their wages. We also find evidence for the role of ethnicity such that students from Macedonian ethnicity on average have lower expectations. Students who have worked while studying have higher expectations compared to their colleagues, either due to having better information on actual earnings, or because of the presumed value of the work experience for future earnings.

These findings show a strong effect of socio-economic background of a student and his/her demographic characteristics on future earnings expectations. Part of the expectations though is formed by the availability of information and emigration intentions of students. The role of the authorities, in this respect, should be to improve the provision of information on potential jobs and earnings to the secondary and tertiary education students. This will assist students in making more rational schooling decisions.

We suggest that a future work in this area includes students from all countries in the Western Balkans region, as to produce comparative results within the region, but also with the EU countries.

Appendix A

University	Type of institution	Faculty
American College Skopje	Private	1 School of Business Economics and Management
		2 School of Computer Science and Information Technology
		3 School of Architecture and Design
St. Cyril and Methodius Skopje	State	4 Faculty of Economics
		5 Faculty of Civil Engineering
		6 Faculty of Agriculture and Food
		7 Faculty of Natural Sciences and Mathematics
		8 Faculty of Architecture
		9 Faculty of Electrical Engineering
		10 Faculty of Medicine
European University Skopje	Private	11 Faculty of Economics

Appendix B

This is a survey on the income prospects of Macedonian students. We would kindly ask you to answer the following questions. It should not take more than 10 minutes. Thank you very much for your cooperation.

1. What is your field of study?

(1) Business studies	(4) Law, Political science
(2) Economics	(5) Medicine
(3) Natural sciences, Engineering	(6) Other_____

2. What level of schooling did your parents achieve (final degree reached)?

Father	Mother
(1) No formal degree	(1) No formal degree
(2) Apprenticeship training	(2) Apprenticeship training
(3) Elementary school	(3) Elementary school
(4) High school degree	(4) High school degree
(5) Higher education	(5) Higher education
(6) University degree	(6) University degree
(7) Master/PhD	(7) Master/PhD
(8) Don't know	(8) Don't know

3. If your father holds a university degree, do you study the same field as your father?   (1) Yes   (2) No

4. If your mother holds a university degree, do you study the same field as your father?   (1) Yes   (2) No
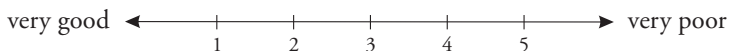
5. When did you start your university studies? In 20_____ .

6. How many years are formally required to obtain a first degree?   _____ years.

7. When do you expect to finish your studies with a first degree?

 (1) 2013   (2) 2014   (3) 2015   (4) 2016   (5) 2017   (6) later (_____)

8. Please mark your personal academic performance (relative to your colleagues')
   on the following scale.

very good ←————————————————→ very poor
             1   2   3   4   5

9. Have you ever read/heard reports about income prospects of university graduates
   and where? (multiple   answers are possible)?

(1) in the university career centers

(2) in the daily/weekly press

(3) personal communication (e.g. friends, relatives, colleagues …)

(4) never

10. What do you expect to earn right after finishing your degree (first degree
    possible at your university) at your first job?

(1) Less than 5,000 denars	(6) Between 16,001 and 20,000
(2) Between 5,001 and 8,000	(7) Between 20,001 and 25,000
(3) Between 8,001 and 10,000	(8) Between 25,001 and 30,000
(4) Between 10,001 and 12,000	(9) Between 30,001 and 40,000
(5) Between 12,001 and 16,000	(10) More than 40,001 denars

11. What would you have earned if you had started working right after finishing
    high school? (State the approximate amount per month) _____.

12. Please tell us your expectations about wage growth:

     a) Having finished my university degree, after 10 years on the job I'll earn
    _____ percent more than in the first year.

     b) Not having acquired a university degree (i.e. had I started right after high
    school), after 10 years on the job I will earn _____percent more
    than in the first year.

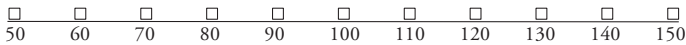13. Setting to 100 your wage 1 year after graduation, how much do you think would be earned by a student with the same characteristics as yours but of the other gender?

☐ 50 ☐ 60 ☐ 70 ☐ 80 ☐ 90 ☐ 100 ☐ 110 ☐ 120 ☐ 130 ☐ 140 ☐ 150
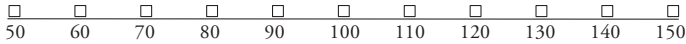
14. Setting to 100 your wage 10 year after graduation, how much do you think would be earned by a student with the same characteristics as yours but of the other gender?

☐ 50 ☐ 60 ☐ 70 ☐ 80 ☐ 90 ☐ 100 ☐ 110 ☐ 120 ☐ 130 ☐ 140 ☐ 150

15. If your answer in 13 and/or 14 was different from 100: why? (Multiple choices allowed)

(1) Characteristics and aptitudes differ between males and females.

(2) Different distribution of household duties.

(3) Employers expect different characteristics between males and females.

(4) Employers have specific views on the differences in the characteristics of males and females, and the distribution of household duties.

16. Setting to 100 your wage 1 year after graduation, how much do you think would be earned by a student with the same characteristics as yours but of another ethnicity?

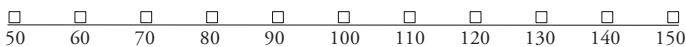☐ 50 ☐ 60 ☐ 70 ☐ 80 ☐ 90 ☐ 100 ☐ 110 ☐ 120 ☐ 130 ☐ 140 ☐ 150

17. Setting to 100 your wage 10 years after graduation, how much do you think would be earned by a student with the same characteristics as yours but of another ethnicity?
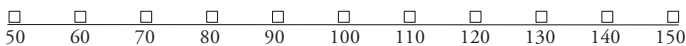
☐ 50 ☐ 60 ☐ 70 ☐ 80 ☐ 90 ☐ 100 ☐ 110 ☐ 120 ☐ 130 ☐ 140 ☐ 150

■ ■

18. After graduation do you expect to work in a household business?

(1) Yes   (2) No   (3) My family doesn't own a business

19. Where do you expect to find a job after graduation from university?

(1) Macedonia (name city) _____
(2) Abroad (name country) _____

20. How do you consider your chances of getting an appropriate job after graduating?

(1) very poor   (2) poor   (3) average   (4) good   (5) very good

21. Are these chances better or worse compared to having only high school education? The prospects after finishing university are:

(1) much worse   (2) worse   (3) same   (4) better   (5) much better

22. Do you hold a regular job during your studies? (1) yes, _____ hours a week (2) no

23. How much do you spend per year of your study in directly university-related expenses (e.g. tuition, books)? _____

24. What were the determinants for your choice of study? Please rank the following items between 1 (most important) and 5(least important).

• Proximity to my home town
• Academic reputation/standard
• Costs (e.g. housing, tuition…)
• Income and job prospects
• Interest in the subject

25. Year of birth _____

26. Gender.   (1) male   (2) female

27. Ethnicity   _____

28. Place of birth (city, state) _____

Appendix C

Table C1: *Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
		Descriptive Statistics			
Year of study	496	0	1	0.59	0.492
Type of school	496	0	1	0.43	0.495
Field of study					
Business	496	0	1	0.20	0.399
Economy	496	0	1	0.09	0.285
Computer Science and Information technology	496	0	1	0.05	0.210
Mathematics	496	0	1	0.07	0.249
Civil Engineering	496	0	1	0.16	0.364
Architecture and Design	496	0	1	0.19	0.389
Medicine	496	0	1	0.07	0.253
Electrical Engineering	496	0	1	0.02	0.147
Agriculture and food	496	0	1	0.17	0.374
Father's education	496	0	7	5.02	1.236
no formal degree	496	0	1	0.00	0.045
apprenticeship training	496	0	1	0.01	0.090
primary education	496	0	1	0.02	0.126
secondary education	496	0	1	0.36	0.482
higher education	496	0	1	0.17	0.375
university degree	496	0	1	0.34	0.474
Master/PhD	496	0	1	0.09	0.282
don't know	496	0	1	0.01	0.109
Father holding university degree or Master/PhD	496	0	1	0.43	0.495
Mother's education	496	0	7	4.96	1.306
no formal degree	496	0	1	0.01	0.078
apprenticeship training	496	0	1	0.00	0.063
primary education	496	0	1	0.03	0.182
secondary education	496	0	1	0.35	0.477
higher education	496	0	1	0.15	0.359
university degree	496	0	1	0.37	0.484
Master/PhD	496	0	1	0.06	0.246
don't know	496	0	1	0.02	0.134
Mother holding university degree or Master/PhD	496	0	1	0.44	0.497
Same field as father	496	0	1	0.19	0.394
Same field as mother	496	0	1	0.13	0.338
Repeaters	496	0	1	0.33	0.471
Academic performance	493	1	5	2.41	1.102

Earnings information					
WI1	491	0	1	0.07	0.258
WI2	491	0	1	0.12	0.328
WI3	491	0	1	0.67	0.471
WI4	491	0	1	0.14	0.344
University monthly net earnings	496	5000	45,000	24,085.69	10,865.673
High school monthly net earnings	489	0	60,000	11,818.00	6697,477
Graduation earnings after 10 years,%	491	0	400	49.35	43.556
High school earnings after 10 y,%	490	0	322	19.76	28.263
Opposite gender	491	5	160	100.10	17.794
Opposite gender 10	491	50	150	112.51	22.334
Other ethnicity	491	50	150	101.96	15.234
Other ethnicity 10	491	10	150	108.53	21.307
Family business	490	0	1	0.31	0.462
Where do you expect to find a job after graduation from university?	488	0	1	0.66	0.476
Employability	491	1	5	3.55	0.992
Regular job	491	0	1	0.09	0.292
Working hours	34	4	50	19.82	14.147
Costs	488	6500	360,000	92,133.48	64,860.180
Year of birth	491	1968	1995	1991.73	2.285
Gender	490	0	1	0.56	0.497
Ethnicity	484	0	1	0.85	0.360

Table C2: *Descriptive Statistics by Gender*

Variable	% male	% female
Field of study		
Business	8.6	11.2
Economy	1.8	6.9
IT	4.1	0.6
Mathematics	1.6	5.1
Civil engineering	9.0	6.9
Architecture	7.8	10.2
Medicine	1.8	5.1
Electrical engineering	1.4	0.8
Agriculture and food	8.2	8.8
Parent's education		
Father		

don't know	0.4	0.8
no formal degree	0.2	0.0
apprenticeship training	0.8	0.0
primary education	0.4	1.2
secondary education	15.5	21
higher education	8.0	9.2
university degree	13.3	20.4
Master/PhD	5.7	3.1
Mother		
don't know	0.8	1.0
no formal degree	0.2	0.4
apprenticeship training	0.2	0.2
primary education	1.6	1.8
secondary education	14.7	20.2
higher education	8.0	7.1
university degree	16.3	20.8
Master/PhD	2.4	4.1
Same education as parent		
same field as father	9.6	9.8
same field as mother	3.9	9.4
Year of study		
junior	27.1	31.8
senior	17.1	23.9
Relative academic performance		
very poor	9.7	16.8
poor	10.5	14.2
average	15.7	16.4
good	6.8	7.2
very good	1.2	1.4
Repeaters	**16.3**	**16.7**
Regular job during studies	**31**	**15**
Perceived employability		
very poor	1.8	1.6
poor	5.7	3.9
average	11.8	19.6
good	16.3	23.1
very good	8.6	7.6
Country of employment		
Macedonia	23.8	37.2
Family business	**16**	**14**
Other country	16	18.5
Ethnicity		
Macedonian	34.9	49.8
other	9.1	6.2
Observations	44.3 %	55.7 %

Appendix D

Table D1: *Expected Graduation and High School Earnings and Expected Earnings Gain 10 Years after Labor Market Entry*

	University earnings β	University earnings 10 years after graduation β
Year of study (juniors=1)	0.149***	0.095**
Type of school (private =1)	0.014	-0.004
Field of study: reference category: Engineering		
MATH	0.013	-0.117
Medicine	-0.247***	-0.239***
Business and economy	-0.005	0.020
Father holding university degree or Master/PhD	0.102**	0.156***
Mother holding university degree or Master/PhD	0.047	0.026
Same field as father	-0.043	-0.044
Same field mother	0.060	0.008
Repeaters	0.014	0.005
Academic performance	-0.003	-0.007
Earnings information (reference category=never)		
WI1 (career centre=1)	0.251***	0.312***
WI2 (daily/weekly press=1)	0.151**	0.223***
WI3 (personal communication=1)	0.011	0.057
Family business	-0.008	-0.010
Country of employment	-0.170***	-0.219***
Employability	0.082***	0.131***
Regular job	0.137*	0.127**
Costs	0.000	0.000
Gender (female=1)	-0.103***	-0.201***
Ethnicity (Macedonian=1)	-0.106**	-0.052

Note: *,** and *** indicate significance at the 10, 5 and 1% level, respectively.

■ ■

Appendix E

Testing Structural Stability of the Regression

Hypothesis A: There are no structural differences between junior and senior students.

$$F_{STAT} = \frac{(a-b)/p}{b/(n-2p)} \qquad\qquad (E.1)$$

and compared calculated number with critical values of F from statistical tables.

Parameters from equation (E.1) are defined as:

a = residual sum of squares

b = residual sum of squares between groups

n = number of observations

p = number of variables

Setting the level of significance α to 0.05 for all three regressions, df_1 = 22 (df_1 = degrees of freedom of the numerator), $df_2 = \infty$ (since degrees of freedom for denominator is large number, we take infinity instead) critical values of F statistics for all three hypotheses is $F(\alpha, df_1, df_2) = F(0.05, 22, \infty) = 1.54$.

First we run the regression model ignoring the groups (to compute a).

			ANOVA			
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	18.748	20	0.937	5.817	0.000
	Residual	73.002	453	0.161		
	Total	91.750	473			

After running the regression model ignoring the groups, we proceed by running the regression model on subsets (year of study).

	Juniors ANOVA				
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	13,134	20	,657	3,465	,000
	Residual	48,709	257	,190		
	Total	61,843	277			

	Seniors ANOVA				
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	6,524	19	,343	2,980	,000
	Residual	20,277	176	,115		
	Total	26,802	195			

Since, n=474, and p=22, we can compute $F = \dfrac{(73.002 - 68.986)/22}{68.986/432} = 1.14.$

The results show that there are no structural differences between junior and senior students.

Since, F = 1.14 < 1.54 = F (0.05, 22, ∞) we conclude that there is no evidence to reject the null hypothesis. There is no structural instability between these two subsets (juniors and seniors) and the regression model is appropriately modelled.

Appendix F

Testing Homoskedasticity in SPSS

Scatterplot
Dependent Variable: Ln (MNW)

R^2 Linear = 3,331E-16
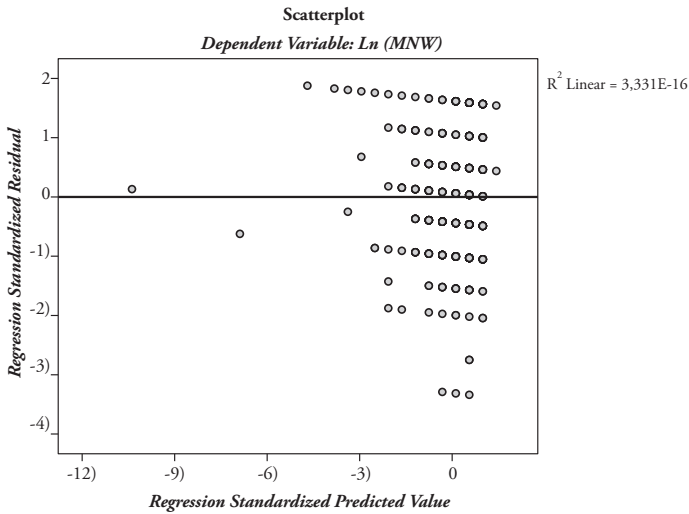
Breusch-Pagan test for heteroskedasticity

Ho: homoskedasticity

H1: heteroskedasticity

$g_i = Residual_i^2 /(71.90/474), i = 1,...,474$

Breusch-Pagan Statistics=N*R Square=474*0.097=45.978

Chi Square (45.978, 42) = 0,310897275

Do not reject Ho.

Descriptive Statistics for Residual Squared						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
ResSQ	474	,00	1,53	71,90	,1517	,20259
Valid N (listwise)	474					

ANOVA for regression when g is dependent variable					
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	82,086	42	2,932	1,713	,014
	Residual	761,594	445	1,711		
	Total	843,680	473			

Model Summary for regression when g is dependent variable				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	,312	,097	,040	1,30822

■ ■

Appendix G

Testing Normality of Residuals in SPSS

We perform the tests for the normality of residuals on 1) studentized and 2) standardized residuals.

1) Studentized residuals

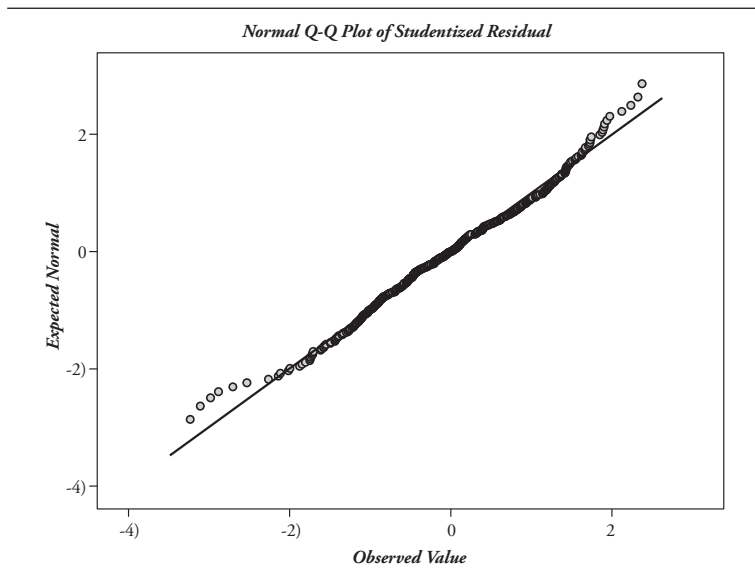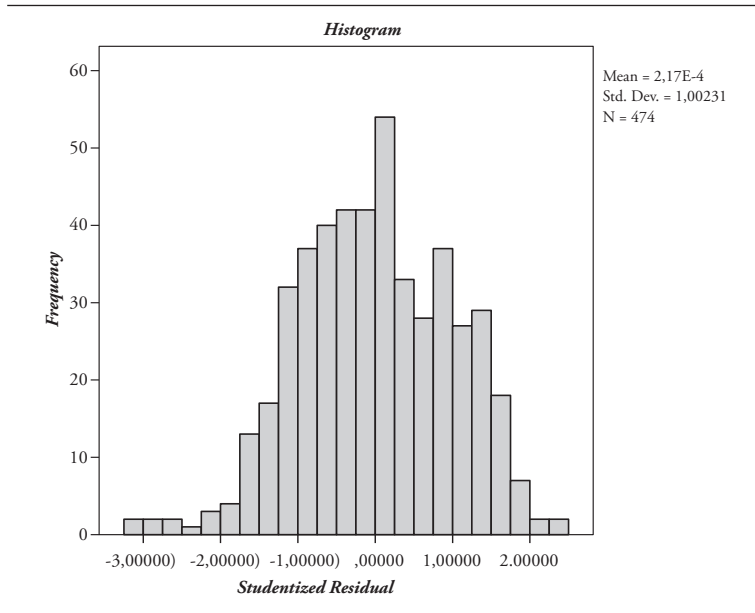Ho: Residuals are normally distributed

H1: Residuals are not normally distributed

	Tests of Normality					
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Studentized Residual	,035	474	,200*	,992	474	,068

[a] Lilliefors Significance Correction

* This is a lower bound of the true significance.

The p-value of the Kolmogorov-Smirnov test for normality of residuals is well above the critical value of 0.05, while the one of Shapiro-Wilk does not reject the null hypothesis of normality only at the 10 percent level of significance. However, we believe both provide reasonable evidence that residuals are normally distributed. Normality could be also confirmed visually from the histogram below and the Q-Q plot.

Histogram

Mean = 2,17E-4
Std. Dev. = 1,00231
N = 474

Normal Q-Q Plot of Studentized Residual

2) Standardized residuals

Ho: Residuals are normally distributed

H1: Residuals are not normally distributed

	Tests of Normality					
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Studentized Residual	,035	474	,200*	,992	474	,069

[a] Lilliefors Significance Correction

* This is a lower bound of the true significance.

Similarly, as the previous results, we see that the p-value of the Kolmogorov-Smirnov test for normality is well above the critical value of 0.05, while the one of Shapiro-Wilk does not reject the null of normality only at the 10 percent. However, we believe both provide reasonable evidence that residuals are normally distributed. Normality could also be confirmed visually from the histogram below and the Q-Q plot.

Histogram

Mean = 3,54E-14
Std. Dev. = ,97755
N = 474

Normal Q-Q Plot of Standardzed Residual
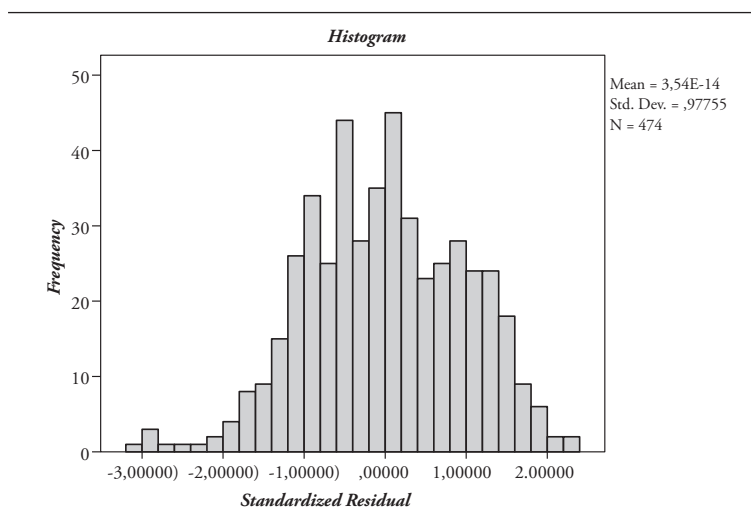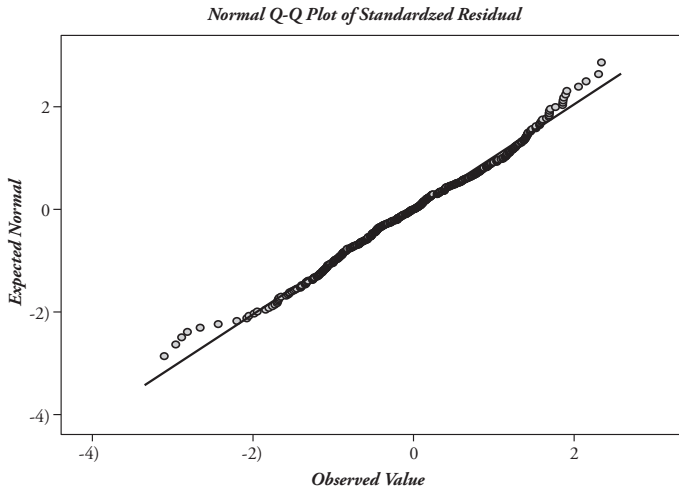
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