Does Student Employment Deteriorate Academic Performance? The Case of Slovenia

TANJA KOSI[*]
BOJAN NASTAV
JANEZ ŠUŠTERŠIČ
Faculty of Management, University of Primorska
Koper, Slovenia

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The article examines features of student work in Slovenia and estimates the impact of the scope of student work on successful completion of an academic year. After intense debate about merits and perils of student work in Slovenia in recent years, which was based on scarce survey data, this is the first study to statistically test the assertion that student work negatively affects academic performance. Different variants of the probit model are estimated using a rich sample of data for 1,890 undergraduate students in tertiary education working through one of the largest student employment services in Slovenia in the period 2005-2008.The results support a common finding from previous empirical studies for other countries that student employment has a (small) adverse impact on academic performance only when hours of paid work exceed some threshold level, in our case around 18 hours per week. The study also reveals only a weak seasonal component in student work, meaning that students work relatively evenly throughout the year. It also points to the lack of connection between the types of work performed by students and their fields of study.

Key words: student work, regulation, tertiary education, academic performance, Slovenia.

INTRODUCTION

Student work is a widespread phenomenon in several European countries, the United States, Australia, New Zealand and China (Robotham, 2012: 66,2009: 326; Beerkens et al., 2011:680).The results of the most recent Eurostudent survey (Orr et al., 2011)show that in more than a half of considered European countries the share of higher education students who are regularly employed[1] during term time is at least 40

[*] Tanja Kosi, Faculty of Management, University of Primorska / Fakulteta za management, Univerze na Primorskem, Cankarjeva 5, SI-6101 Koper, Slovenia / Slovenija, tanja.kosi@fm-kp.si

[1] An employment activity is considered as regular if it forms a part of a student's typical study week in the term time and lasts at least one hour per week (Orr et. al, 2011: 90).

per cent. Countries with the highest regular employment rates among students are Switzerland and Czech Republic (73 per cent), Denmark (61 per cent), and Estonia (56 per cent). Nevertheless, regular paid employment is not the major element of students' weekly time budget, as students on average spend (only) a fifth of their active time working rather than studying. Students on average work more than 10 hours per week only in Poland (19), Czech Republic (16), Estonia (15), and Portugal (14).The study (Orr et al., 2011) also reveals that income from employment constitutes about a half of the total income budget of students (the average for 22 countries is 53 per cent), showing that self-financing is a major source of student financing all over Europe. However, the facts that student work is also widespread in relatively wealthy countries and that self-financing is above one third even in countries where the state guarantees a basic salary or support to students (as in the Netherlands, Germany and Finland) imply that motivation for student work and the share of self-financing depend not only on economic factors, but also on cultural influences and students' financing strategies (Orr et al., 2008: 120).

Slovenia was not included in the 2011 Eurostudent survey. The 2008 Eurostudent survey (Orr et al., 2008: 119) estimates that 65 per cent of Slovenian students work alongside studying and reports that they spend a third of their active time working rather than studying. Student employment in Slovenia is thus both relatively widespread and intense in the European context. It is also supported by a particular institutional structure. The term »student work« refers to the work of students in tertiary education[2] (i.e. college and university students) and high school students performed on the basis of student work referrals[3] through specialised student employment services. Compared to other types of employment contracts, student work is loosely regulated, administratively very simple and has until 2012[4] enjoyed significant tax advantages (see OECD, 2011: 73). Adding the fact that in Slovenia the majority of students have free access to tertiary education (see e.g. Eurydice, 2011: 88) and enjoy a range of benefits in the form of subsidised coupons for restaurants, subsidised accommodation, and extracurricular sports and other activities, students may be tempted to delay their graduation in order to keep the valuable »student status« for as long as possible.

The Slovene system of student work has come under severe critique in recent years. Ignjatovič and Trbanc (2009: 44) claim that students, being both a cheaper and a more flexible labour force, crowd out young graduates from the labour market.[5] Koske (2009: 24-25) believes that student work prolongs the length of tertiary education and suggests that the Slovenian government should consider phasing out

[2] Tertiary education in Slovenia comprises higher vocational college education and higher academic and professional education. For more information, see Eurydice (2013).

[3] A student referral is a slip of paper which serves as a proof of employment and as a report of student's work.

[4] In 2012, Slovenian parliament adopted the Balancing of Public Finance Act (Official Gazette of the Republic of Slovenia, No. 40/2012) that raised the rate of the concession fee on income from student work from 12 to 23 per cent. The amendments to the Personal Income Tax Act (Official Gazette of the Republic of Slovenia, No. 40/2012), effective by 2013, reduced the special personal allowance for student work income by 25 per cent.

[5] Slovenian labour market is characterised by rather rigid employment protection legislation, especially when it comes to regulatory procedures covering dismissal of regular workers. For comparison with other EU countries see Laporšek and Dolenc (2012).

preferential regulatory and fiscal treatment of student work. Following the critics, in 2010 the parliament adopted a law replacing student work with mini jobs, largely based on the German example, subject to tighter regulations and less tax advantages, but available also to the unemployed and pensioners. The law was subsequently rejected by a wide majority of voters in a popular referendum. Discussions during the pre-referendum campaign revealed that student work was valued positively by the majority, not only as a source of income for students, but also as a gateway to valuable work and social experience and building up independent adult life. In fact the particular system of student work was introduced already in socialist times and has since become accepted by the majority as a "natural" element of the labour market.[6]

The empirical evidence used in these recent public and political discussions was based on scarce survey data and the arguments were not supported by formal statistical tests. This article fills a part of this void. It uses a rich sample of data on the actual work performed by undergraduate students enrolled in different years of study at various tertiary education institutions (i.e. higher vocational colleges, universities and single higher education institutions) in Slovenia in the period 2005-2008. Its focus is on exploring the relationship between student work and academic performance, leaving aside other aspects of this complex social phenomenon.[7]A probit model is estimated to test the hypothesis that the extent of student employment negatively affects academic performance in the sense of a successful completion of a year of study. Additionally, this article investigates the extent and timing of student employment in Slovenia, and examines the type of paid work taken on by students, as this may also be relevant for understanding the impact of student work on academic performance.

The remainder of the article is structured as follows. Section 2 places the article in the existing literature. Section 3 describes the data and the methodology used. Section 4 examines the scope and timing of work done by individual students, the type of work taken on by students and its correspondence to their fields of study, and presents the results of statistical tests of the hypothesis that the scope of individual student's work decreases the student's probability of progressing to the next year of study. Section 5 concludes with a discussion of our results.

MERITS AND PERILS OF STUDENT WORK: LITERATURE REVIEW

By taking on occasional and temporary jobs, students may gain valuable work experience and enhance their future (short- and medium-term) opportunities in the labour market as suggested by Geel and Backes-Gellner (2010), Schrøter Joensen (2009), Häkkinen (2006), Metcalf (2003), and Neumark and Joyce (2001) for university and college students.[8] If related to their field of study, student employment has even a larger positive impact on short- and medium-term labour market outcomes in the form

[6] It also has to be added that the low popularity of the government contributed to the rejection of the law. The importance of government popularity for referendum outcome is demonstrated statistically by Šušteršič et al. (2011) for the case of the referendum on pension reform which was held a couple of months after voting on the mini jobs law.

[7] The same dataset is used to analyse labour market effects of student work in Kosi et al. (2010).

[8] Dustmann and van Soest (2007), Ruhm (1997) and Marsh (1991) reach similar conclusions for high school students.

of lower risk of unemployment, shorter job search duration, and higher wage (Geel and Backes-Gellner, 2010). In addition to valuable work experience and better understanding of business world, student work also contributes to the development of communication, teamwork and time management skills, enhances self-confidence and spurs personal development (Robotham, 2012; Manthei and Gilmore, 2005; Ackerman and Gross, 2003; Curtis and Shani, 2002). There is some (rather scarce) evidence that student employment positively affects academic performance by increasing student motivation and self-confidence and improving understanding of the course content (confirmed by one fourth of students taking part in the Robotham's (2012: 71) survey). Hodgson and Spours (2001: 383) suggest that in order to benefit from the advantages of term-time working, students should attempt to make connections between their term-time work, their fields of study and their career aspirations.

Combining academic studies with paid work also has negative consequences. Several studies (see Broadbridge and Swanson, 2006: 162) confirm that many students have problems with balancing the workload they take on and obligations related to their studies. Some other studies (e.g. Manthei and Gilmore, 2005; Ackerman and Gross, 2003) suggest that students who are engaged in paid employment primarily sacrifice their social life and devote less time to extra-curricular activities, such as voluntary work and sports. Robotham (2012) and Kulm and Cramer (2006) show that both holds and that working students cut down time devoted to reading study materials, as well as time for leisure and social activities. This view is in line with the finding of the Eurostudent survey (Orr et al., 2011: 89) that time allocated to study-related activities tends to diminish with rising hours spent on regular paid employment, but additional time spent on paid jobs is not fully compensated by a reduction in the study-related time budget. The latter suggests that students increase the overall active time budget at the expense of social and leisure activities. Student employment therefore appears to have both positive and negative effects on academic performance, and which will prevail is rather an empirical issue.

A growing body of empirical literature examines the link between (the extent of) paid employment and students' academic performance, measured by grade point average, dropout/retention rates, exam scores, attendance records, and similar indicators (Baffoe-Bonnie and Golden, 2011: 2). The studies do not provide very robust and consistent evidence on the link between student employment and academic performance. Variations of findings partly stem from methodological differences, different geographical coverage of samples and different types of data. Nevertheless, some general conclusions can be drawn. Firstly, the majority of student jobs are unskilled jobs in the services sector (Robotham, 2012: 70; Carney et al., 2005: 311; Broadbridge and Swanson, 2006: 166-167). Secondly, the number of paid hours of work matters more than the student's employment status itself (Katsikas and Panagiotidis, 2011). Thirdly, the preponderance of evidence (Kalenkoski and Pabilonia, 2010; Schrøter Joensen, 2009; Callender, 2008; Applegate and Daly, 2006; Bradley, 2006) suggests the relationship is nonlinear and that student employment has adverse impacts on academic performance when hours of paid work exceed a certain threshold level, typically between 15 and 25 hours per week. Channels through which intense student employment negatively affects economic performance are: missed lectures and tuto-

rials and reduced time and effort[9] for academic study outside class hours (Robotham, 2012: 71, Kulm and Cramer 2006: 931; Manthei and Gilmore, 2005: 210),[10]low energy, vitality and fatigue (Robotham, 2012: 71; Carney et al., 2005: 313),and stress plus other health-related problems (Carney et al., 2005: 313; Manthei and Gilmore, 2005: 211).[11]

Other factors importantly affecting academic performance are: age, gender, social background (parents' income level, parents' education, ethnicity, living arrangements), higher education institution, field of study, entry qualifications, and student's ability and motivation (Beerkens et al., 2010; Callender, 2008; Nonis et al. 2006). Cognitive ability or intelligence has been found to be one of the main personal-specific determinants of academic achievement(e.g., Ackerman and Heggestad, 1997). This especially holds for elementary and secondary school students, while cognitive ability loses some of its power to predict the academic performance of students in higher education (O'Connor and Paunonen, 2007: 973). Academic performance of students also depends on their personality traits with the Big Five being agreeableness, conscientiousness, emotional stability, openness, and extraversion (Poropat, 2009).When estimating the impact of student employment on economic performance, these mostly unobservable factors should be taken into account by using proxies or taking the instrumental variable approach, if possible, as suggested by Angrist and Krueger (1992).

Summing up, most empirical evidence suggests that modest employment activity of students does not harm their academic performance, implying that positive effects of better time management, better understanding of the course content, and increased motivation, self-confidence and aspirations prevail over the negative effects of cutting down time devoted to studies. But beyond a certain threshold of time devoted to employment, negative effects on academic performance seem to prevail.

METHODOLOGY AND DATA

We use two databases obtained from the largest Slovenian student employment service, whose (national) market share fluctuated between 45 and 55 per cent over the period 2006-2009 and stood at 20 per cent in 2005 and was operating fairly evenly over the territory of the country.

The first database consists of aggregate monthly data for the period 2005-2008 (total number of observations is therefore 48) on the total value of student work performed through the employment service in question and the total amount of work hours performed per month, classified according to the level of education (high-school or tertiary education students), type of study (full-time or part-time) and the particular high school or tertiary education institution. The work performed by high school students accounts for approximately 30 percent of all students' work. As our article focuses on the work of tertiary students, the data on the high school population serves merely for comparison.

The second database consists of a sample of anonymised data at the level of indi-

[9] Empirical evidence on the causal (positive) relationship between study-effort and grade performance is provided by Stinebrickner and Stinebrickner (2008).

[10] March and Kleitman (2005) confirm the same for high-school students.

[11] Rothstein (2007) finds similar channels through which term-time work negatively affects academic achievements of high-school students.

vidual student work referral (hereafter referred to as microdata). For each individual year, for which data were available in the electronic form (i.e. from 2005 to 2008), a random sample of 1,500 tertiary students was created. Next, the data for each student who was included in any of the four annual samples were extended to comprise all the other years when this student worked and not merely the year in which he/she was initially included in the sample. The resulting sample of microdata totals 81,711 observations (with 79,027 observations referring to undergraduate students), which is the number of work referrals paid in the period 2005-2008 for all students selected into the sample. It comprises basic demographic data (gender, age, place of residence), information on the scope of individual student's employment (in terms of hours worked as well as in terms of earnings), the type of their work, and basic information about their studies (year and field of study). As the number of observations for graduate students (i.e. master and doctoral students) is relatively small, we exclude them from the analysis and focus on undergraduate students. The representativeness of the sample for the entire (undergraduate) student population in Slovenia is assured by the high market share of the employment service that provided the data, by the random selection of students (and thereby referrals) into the sample, and by the large sample size.

Using this sample of microdata and focusing on undergraduate students, we first assess the number of hours worked per week by an average student in Slovenia in order to give an impression about whether the extent of paid work leaves students enough time to study. Since working in summer is assumed less detrimental for academic success than work during the term, we also examine the distribution of student work over the academic year, using the monthly aggregates in the first database. Then we classify the type of work performed by students, as reported on individual referrals in the microdata sample, into broad categories according to required skills and area of work. In this way we try to establish whether there is any complementarity between the type of work taken on by students and their fields of study, as this may affect their understanding of the content of lectures and academic motivation, and in turn (positively) affect academic performance. It has to be noted that referrals are sometimes used by employers to pay for work that was not performed by students in order to avoid paying higher taxes and social contributions, in which case the data on type of work are meaningless. The type of work may also be reported inaccurately by students due to neglect of this "administrative" requirement. Still, we believe that the share of such misreporting is moderate and that the sample can provide a broad picture of the type of work students perform.

Finally, we develop and estimate a probit model testing the hypothesis that the scope of student work negatively affects the probability of student's regular progression to the next year of study. Regular progression is our measure of academic success as it can be calculated from the sample data (details are explained in the next section). We first estimate the model for the total sample and then separately for each of the quartiles with respect to the scope of individual student's work to discover possible non-linearity in the impact of paid work on academic performance. We control our estimates for the effects of gender, field of study, year of study and part-time versus full-time study. Unfortunately, our sample does not include data on social background and personal traits (ability) of students,

so we are not able to control for these two important factors of academic success. We are aware that this may create an omitted variable bias in our results and therefore discuss its implications in the final section. We also test for the existence of possible reverse causality, running from academic success to the scope of work, in the sense that students who find it hard to fulfil their study requirements turn to paid work as an alternative.

RESULTS

The scope and distribution of the student work

Our sample of microdata enables us to estimate the average number and the distribution of hours worked by tertiary students per academic year in Slovenia.[12] Our data for the year 2008 show that tertiary students on average worked 566 hours per year. However, large standard deviation and high extreme values indicate that the average is not a good representative of the characteristics of the population. Considering the median value rather than the average, we conclude that the usual (paid) workload of a student was 428 hours a year, which means 8.2 hours a week, if we simplify that the work is evenly distributed throughout the whole year. This figure can be put in perspective of the Bologna declaration, which sets unified criteria for the workload of a full-time student during an academic year at European universities at1500 to 1800 hours per academic year. The median extent of student employment of 8 hours a week throughout the calendar year thus imposes an additional workload of roughly 25 per cent.

In addition, it is reasonable to expect that students work more during the summer, when they do not need to fulfil study requirements, than during term time. The analysis of our aggregate data gives a picture of seasonality of the amount of work performed by full-time tertiary students in Slovenia (Table 1). The fixed base index, which compares the amount of full-time students' work hours in a given month to the level in January of the same year, shows that the extent of student work is highest from July to September (when the index takes values between 146 and149 on average) and in December (139), and lowest in January (100). Relatively small degrees of deviation of monthly indexes from the annual averages indicate that the seasonal component is nevertheless relatively weak.[13]

[12] It is assumed that a particular student works only through the selected student employment service which, to a certain extent, is an unrealistic assumption and could mean that our estimates of the average number of work hours are slightly underestimated. However, considering the size of the market share of the selected employment service, this information would not essentially influence the validity of our results.

[13] The seasonal component is much more evident in the distribution of high school students' work as the latter are bound by compulsory school attendance. By way of comparison, the fixed base indexes for the work performed by full-time high school students during July and August achieve very high values (362 and 348), compared to the average index across all considered months of 160.

Table 1.
Fixed base index (January = 100) of the number of hours worked per month by full-time tertiary students through student employment services

Year / Month	1	2	3	4	5	6	7	8	9	10	11	12	Annual geometric average
2006	100	134	120	098	131	143	171	168	180	138	141	162	138
2007	100	95	119	103	112	107	127	135	128	109	128	125	115
2008	100	121	115	119	115	122	148	136	140	112	124	129	123
Arithmetic average	100	117	118	106	119	124	148	146	149	119	131	139	125

Source: aggregate data from the selected student employment service, own calculations.

What kind of work do students perform?

The individual-level data on the type of work performed by undergraduate students as recorded on student work referrals vary considerably and are not always completely reliable, as explained in the methodology section. We have first grouped them into 13 broad categories of similar types of work, whereby the work referrals for »other work« (over 10 percent of all) were excluded. The 13 categories were then grouped into four broader categories according to their complexity as shown by Table 2.

Table 2.
The structure of work hours performed by undergraduate tertiary students in Slovenia in the period 2005-2008 according to the complexity of work

Type of work		Share in total hours of classified work (in %)*		Share in total work hours (%)
A. Physical work	1. Light physical work	8.6	22.5	20.4
	2. Heavy physical work	13.9		
B. Non-demanding work	3. Administrative work	24.4	49.0	44.5
	4. Work in catering	7.5		
	5. Child care	1.6		
	6. Basic professional work	0.8		
	7. Promotion and information activities	14.7		
C. Moderately demanding work	8. Tourism and sport	0.8	12.0	10.9
	9. Sales and marketing	6.1		
	10. Health care	0.3		
	11. Graphics, design, photography etc.	1.5		
	12. Other moderately demanding professional work	3.3		
D. Very demanding work		16.5	16.5	15.0
TOTAL CLASSIFIED WORK		100.0	100.0	90.9

nastavak Table 2.

Type of work	Share in total hours of classified work (in %)*		Share in total work hours (%)
13. Other (non-classified) types of work			9.1
TOTAL WORK			100.0

Note: * The calculation of shares does not include other (non-classified) types of work.
Source: microdata from the selected student employment service, own calculations.

Physical and other non-demanding types of work together account for 71.5 percent of all types of work performed by students through the employment service (excluding "other types of work", which we could not classify into the above-defined groups). We estimate that these types of work do not require specialised skills gained by the students at the university, and conversely, do not offer them any particular experience which could increase their employability after graduation.

Moderately demanding work accounts for 12.0 percent of total classified work. This is where students apply some theoretical knowledge and skills gained in their study process in practice. The remaining 16.5 percent is **very demanding professional work**, which requires specialised knowledge and skills gained by students during their studies, and which motivates students towards upgrading them. The data also show that students in higher years of study are more likely to perform moderately and very demanding types of work, which also indicates that they may be using skills learned in studies in their paid work. It is assumed that these two types of work, accounting together for 28.5 per cent of all classified work, play an important role in future careers of the students who perform them and that they may be complementary rather than detrimental to their academic effort.

A possible positive influence of employment on academic performance would be reinforced if students would work in areas that are related to their fields of study. We therefore tried to identify the types of work performed by students studying at different higher education institutions. To this purpose, numerous vocational colleges and higher education institutions have been classified into broader groups, for which we examined types of work performed. The results (see Kosi et al., 2010: 74) indicate that a considerable share of tertiary students perform work that is not related to their field of study. Lack of correspondence between the study programmes and the types of work performed by students has also been ascertained in the majority of other European countries(ESIB, 2005: 38-39).

Student work and academic performance: probit model results

Our sample allows us to analyse academic performance of students in terms of their regular progression to the next year of study. For each individual student who worked for at least an hour during an academic year, the data on the referral tell us the year of study in which he/she was enrolled at that time. For students who worked in more than one academic year (consecutive or not), we can thus check whether they have regularly progressed to

higher years of study or not. As we cannot check the academic progression of students who worked in only one academic year, they had to be excluded from the sample. Our analysis thus focuses on undergraduate tertiary students who worked in more than one academic year.

The data for each individual student remaining in the sample (data on hours worked, the faculty attended, and the year of study) have been summed up to the level of an academic year. To measure academic performance, we then constructed a new binary variable for the progression of a student to the next year of study (***PASS***), which takes the value 1 when a student regularly passes to the next year and the value 0 otherwise. After that we had to delete each student's first observation (i.e. his/her observation for the earliest academic year), as we could not properly calculate the value of ***PASS*** for these observations due to lack of data for the previous academic year. We ended up with 2,363 observations for 1,890 (full-time and part-time) undergraduate tertiary students.

To estimate the impact of the scope of student work on students' academic progression we use the probit model. The alternative would be a logistic regression(assuming logistic distribution instead of standard normal distribution as in the probit model), which in general leads to the same conclusions (Wooldridge, 2002: 536-537). Panel nature of the data usually requires the inclusion of random or fixed effects. However, since we have a very large number of students (N=1,890) relative to the total number of observations (NT=2,363) we pool the data,[14] estimate the probit model and adjust the standard errors for intragroup correlation. The robustness of the model is checked by estimating the corresponding random effect probit model, as suggested by Wooldridge (2001:484-486).

The probability of progressing to the next year of study, given the explanatory variables, reads:

$$P(PASS_{i,t} = 1|X_{i,t}) = \Phi(X_{i,t-1}\, b), \qquad \text{(I)}$$

where:

- ***PASS*** is a dummy variable that assigns the value 1 if a student regularly progresses to the next year of study and the value 0 otherwise;
- $\boldsymbol{X}$ is the $\boldsymbol{1}\times$K covariate vector (includes a ***1*** for the intercept) and $\boldsymbol{b}$ is the $\boldsymbol{K}\times\boldsymbol{1}$ vector of unknown regression parameters;
- subscript ***i*** denotes the observed student and subscript ***t*** stands for the academic year;
- function is the standard normal cumulative distribution function ensuring that the probability takes the value between 0 and 1.

The explanatory variables (vector covariates) included in $\boldsymbol{X_{i,t-1}}$ are:

- ***WORKh***, standing for the number of hours worked by a student in a given academic year or, alternatively, ***termWORKh*** denoting the number of hours worked by a student during term-time (i.e. from the beginning of October to the end of June) in a given academic year (we expect term-time employment to be more detrimental for regular progression to the next year of study than summer employment);
- ***Dys_x*** - dummy variables for years of study that assign the value 1 if a student was enrolled in the year ***x*** of study and the value 0 otherwise (***x*** = 2, 3, 4; the reference year is the first year of study);

[14] When the number of cross-sectional units (N) is large and the time-series length (T) is fixed (or smaller than 10), fixed effect probit and logit models do not give consistent estimates of regressions coefficients (Green, 2004: 109).

- ***Dpt*** - a dummy variable that assigns the value 1 if the observed student is a part-time student and the value 0 otherwise;
- ***Dfield_y*** - dummy variables for broadly defined major fields of study[15] that assigns the value 1 if studies of the observed student belong to the field ***y*** and the value 0 otherwise (***y*** = 2,…,11; the reference field is economics, business, tourism and administration);
- ***Dgender*** - a dummy variable for gender that assigns the value 1 if the observed student is female and the value 0 otherwise.

Subscript ***t-1*** indicates that all explanatory variables refer to the past academic year or the academic year for the preceding observation.

Dummy variables for particular years of study are included in the model with an aim to control for the effect of years of study on progression to the next year. We, for example, expect the rate of progression from the third to the fourth year of study to be higher than the rate of progression from the first to the second year of study. The reasoning behind is that students in higher years are more experienced and already have a successful academic past. Due to similar reasons we include an additional dummy variable for part-time students that divides the population of students into two groups: part-time students (***Dpt =1***) and full-time students (***Dpt =0***). Since academic performance tends to vary between different fields of studies, we also introduce ten dummy variables for fields of studies (***Dfield_y***). Due to possible differences in academic performance between male and female students, we additionally control for gender (***Dgender=1*** for females).Summary statistics for the variables included in the probit analysis is provided in Appendix 1.

The described non-linear binary response model is estimated by the maximum likelihood (ML) method according to which the parameters are estimated to maximize the probability of observing the sample data given a specific model for the data. We first ignore the panel nature of our data and estimate the model on pooled data. Due to multiple observations for some students, we use standard errors that are adjusted for intragroup correlation. The results of estimation for different model specifications are provided in Table 3. Since the magnitudes of the regression coefficients are difficult to interpret, we report also marginal effects of explanatory variables on the response probability (in brackets).

The significance of the model is judged according to the likelihood ratio test.[16]The test compares how well the estimates of the two models, the basic/unrestricted model without explanatory variables and the considered restricted model with ***j*** explanatory variables, fit the sample data. The test statistics is asymptotically distributed according to a χ^2 distribution with ***j*** degrees of freedom. The significance of the likelihood ratios (0.000 for all the models) shows that the models statistically significantly explain a part of variation in dependent variable ***PASS***. The value of pseudo coefficient of determination (pseudo R^2) provided by Sta-

[15] Our classification does not strictly follow any broadly accepted (international) classification of fields of education, which limits the possibilities of international comparison.

[16] LR= -2[***ln***L(restricted) - ***ln***L(unrestricted)] ~ χ2(j), where ***ln***L(unrestricted) denotes the logarithm of likelihood for the unrestricted model (the model without explanatory variables) and ***ln***L(restricted) the logarithm of likelihood for restricted model (the model with ***j*** explanatory variables).

ta[17] indicates that the major part of variation in dependent variable remains unexplained, although some of the explanatory variables significantly affect ***PASS***. Pseudo R2, however, does not directly express a part of variation in ***PASS*** explained by the model (unlike the coefficient of determination when using the ordinary least squares method).

The estimation results of the probit model show that the scope of individual student's work per academic year (variable ***WORKh***) significantly negatively affects the probability of progressing to the next year of studies, but the impact is very weak. The size of the impact is expressed by the marginal effect, which shows the change in the probability of progressing to a higher year of studies resulting from an increase in the scope of work by one hour per year (assuming that the student previously worked the average number of hours). The marginal effect for the scope of work in the preceding academic year (i.e. for $\boldsymbol{WORKh_{t-1}}$) is between -0.000072 (Model 3) and -0.000076 (Model 1), which means that an increase in the scope of work for 100 hours annually decreases the probability of progressing by 0.72 to 0.76 percentage points. The negative impact of the scope of student work on academic performance is, for a student working the average number of hours, therefore almost negligible. The estimated marginal effect for variable ***termWORKh*** is similarly low (between -0.000086 and -0.000090), implying that even term-time work does not importantly deteriorate academic performance of an averagely working active student.

The regression results disclose statistically significant differences between probabilities of regular progression for different years of study. As expected, the higher the year of study, the higher is the probability of regular progression to the next year. According to our results, gender does not significantly affect academic performance of working students. We also detect no statistically significant difference between academic performance of full-time and part-time students that (at least occasionally) work through the student employment service. A possible explanation is that most part-time students in our sample keep this status for other reasons than studying while having a full-time job.

Probability of regular progression to the next year of studies differs between certain fields of study. There is no significant difference in probabilities of progressing between students of economics, business, tourism and administration (reference field 1), philosophy and other humanities and social sciences (field 2), and law (field 3). On the other hand, students of electrical engineering, energetics, computer and information science (field 6), chemistry, biotechnology and agronomy (field 8), and pedagogy and sport (field 4) record significantly lower progression probabilities than students of aforementioned humanities and social sciences. Other results can be read from Table 3.

We do not separately report the results for the random effects probit model, since the results are very close to the estimates of the ordinary probit model. Besides, the likelihood-ratio test does not reject the hypothesis of inexistence of unobserved individual-level heterogeneity and therefore implies the absence of random effects in the model.

[17] McFadden coefficient of determination is calculated as: Pseudo R2 = 1- [***ln***L(restricted)/ ***ln***L(unrestricted)].

Table 3.
Probit estimates of the probability of regular progression to the next year of study (regression coefficients and marginal effects)

Dependent variable: ***PASS***$_t$	Model 1	Model 2	Model 3	Model 4
WORKh(t-1)	-0.000212***		-0.000201***	
	(-0.000076)		(-0.000072)	
termWORKh(t-1)		-0.000252***		-0.000241***
		(-0.000090)		(-0.000086)
YS2(t-1)	0.218**	0.218**	0.212**	0.212**
	(0.0766)	(0.0765)	(0.0741)	(0.0741)
YS3(t-1)	0.350***	0.351***	0.317***	0.318***
	(0.121)	(0.122)	(0.110)	(0.110)
YS4(t-1)	0.461***	0.465***	0.454***	0.458***
	(0.152)	(0.153)	(0.149)	(0.150)
Dpt(t-1)	0.0348	0.0356	0.0174	0.0202
	(0.0124)	(0.0127)	(0.00622)	(0.00720)
Dgender(t-1)	0.0671	0.0688	0.0305	0.0315
	(0.0242)	(0.0248)	(0.0109)	(0.0113)
Dfield2(t-1) (Philosophy and other humanities and social sciences)			-0.126	-0.123
			(-0.0457)	(-0.0448)
Dfield3(t-1) (Law)			-0.0871	-0.0827
			(-0.0318)	(-0.0301)
Dfield4(t-1) (Pedagogical faculties and sport***)***			-0.226*	-0.221
			(-0.0840)	(-0.0823)
Dfield5(t-1) (Mathematics, physics, other natural sciences and engineering			-0.135	-0.135
			(-0.0495)	(-0.0497)
Dfield6(t-1) (Electrical engineering, energetics, computer and information science)			-0.256*	-0.258*
			(-0.0956)	(-0.0963)
Dfield7(t-1) (Medicine, pharmacy and veterinary science)			0.290*	0.294*
			(0.0967)	(0.0982)
Dfield8(t-1) (Chemistry, biotechnology, agronomy)			-0.349**	-0.346**
			(-0.132)	(-0.131)
Dfield9(t-1) (Architecture, construction, logistics, maritime, environment)			0.0334	0.0396
			(0.0119)	(0.0141)
Dfield10(t-1) (Music, theatre, radio, film, television, fine and other arts)			0.142	0.157
			(0.0490)	(0.0542)
Dfield11 (t-1) (Other or unknown fields of study)			-0.643***	-0.645***
			(-0.249)	(-0.249)
Constant	0.296***	0.268***	0.444***	0.418***
Wald chi2 (prob. > chi2)	60.67 (0.000)	58.74 (0.000)	103.5 (0.000)	102.3 (0.000)
Pseudo R^2	0.0183	0.0178	0.0326	0.0323

Notes:
1) The number of students in the sample (N) equals to 1,890. Total number of observations (NT) is 2,363.
2) Marginal effects are reported in parentheses. For a dummy variable, the marginal effect is computed as the difference in the estimated probabilities with the dummy variable equal to one and zero and other variables at their means. For continuous variables, the marginal effect is the derivative.
3) The reference year of study is the first year. The reference gender is male. The reference field of studies is economics, business, tourism and administration.
4) Levels of significance: * p<0.05, ** p<0.01, *** p<0.001.
Source: microdata from selected employment service, own calculation.

For further estimations of the model, we divide the observations into four groups (quartiles) according to the number of hours worked by individual students per academic year. The results of estimation (using adjusted standard errors) are provided in Table 4. The impact of the scope of work on the academic performance is significant only for the fourth quartile, confirming the prevalent finding of previous studies (Kanelkoski and Pabilonia, 2010; Schrøter Joensen, 2009; Callender, 2008; Applegate and Daly, 2006; Bradley, 2006) that student employment has adverse impact on academic performance only when hours of paid work exceed some threshold level, in our case around 940 hours per academic year or 18 hours per week. In any case, the effect is quantitatively unimportant. An increase of annual work hours by 100 (for a student previously working 1,351 hours per academic year, i.e. 25.9 hours per week), decreases the probability of progressing by 2.4 percentage points.

Table 4.
Results for the probit model estimated separately for each of the four quartiles defined by the number of individual student's work hours per academic year

Dependent variable: $PASS_t$	1st quartile (up to 251.51 work hours per year)	2nd quartile (from 251.51 to 519.68 work hours per year)	3rd quartile (from 519.68 to 940.19 work hours per year)	4rth quartile (940.19 work hours per year and more)
WORKh(t-1)	-0.000174	-0.000997	-0.0000531	-0.000636***
	(-0.000062)	(-0.00033)	(-0.000019)	(-0.00024)
YS2(t-1)	0.516***	0.0948	0.0986	0.185
	(0.173)	(0.0314)	(0.0347)	(0.0692)
YS3(t-1)	0.230	0.224	0.372**	0.555***
	(0.0806)	(0.0736)	(0.127)	(0.199)
YS4(t-1)	0.174	0.307	0.507**	1.007***
	(0.0607)	(0.0965)	(0.164)	(0.310)
Dpt(t-1)	-0.159	-0.147	0.0405	0.236*
	(-0.0587)	(-0.0511)	(0.0143)	(0.0874)
Dgender(t-1)	0.0908	0.192	-0.132	0.0618
	(0.0327)	(0.0651)	(-0.0465)	(0.0234)
Constant	0.185	0.706*	0.363	0.720**
Observations (NT)	591	591	591	590
Log (pseudo) likelihood	-365.9	-345.7	-363.0	-365.6
Wald chi2 (prob. > chi2)	13.63	10.96	14.48	53.24
Pseudo R^2	0.0180	0.0149	0.0181	0.0677

Notes: see Table 3.
Source: microdata from selected employment service, own calculation.

The estimated probit model tests whether the scope of student work throughout the academic year ***t-1*** affected tertiary students' probability of progression to the next year of study for the following academic year (***t***). Such formulation is in line with the assumption that causality runs from the scope of student work to academic performance. But one might also hypothesize the other way round, namely that students who are not performing well academically (i.e. they fail to progress to the next year) get discouraged from studies and increase their time in paid employment. To test whether the causal relationship might run the other way around, we also estimate a linear regression model where the scope of individual student's work in the current academic year is treated as a dependent variable:

$$WORKh_{i,t} = \alpha + \beta PASS_{i,t} + \sum_{x=2}^{4} \gamma_x Dys\_x_{i,t} + \delta Dpt_{i,t} + \varphi Dgender_{i,t} \quad \text{(II)}$$

Variables and subscripts (beware the time dimension in comparison to equation I) have the same meaning as in equation (I). The error term is designated by ε. The dependent variable ***WORKh*** is a continuous variable that linearly depends on the explanatory variables. The equation (II) is estimated by the ordinary least squares (OLS) method using robust standard errors corrected for the correlation within clusters (i.e. the correlation between observations for the same student). The results provided in Appendix 2indicate that students repeating the year of study do not work significantly more hours than non-repeaters, controlling for the year of study, full-time/part-time status, gender and field of study. These results do not speak in favour of reversed causality, implying that the scope of work performed by students in the sample is not driven by their poor academic performance.

CONCLUDING REMARKS

The article presented the first and so far the only in-depth analysis of student employment in Slovenia using sample data and statistical model estimations rather than survey data, and focusing on its impact on academic performance. The study was prompted by the intense debate about merits and perils of student work in Slovenia in recent years, which was based on scarce survey data and arguments that have (at that time) not been statistically verified.

The analyses of the aggregate data and a rich sample of microdata about the work and studies of undergraduate tertiary students in the period 2005-2008, acquired from the largest student employment services in Slovenia, disclose that students work throughout the academic year and not just during the time when they are free from lectures or exams. The amount of work of a representative student totals 8 hours a week assuming an even distribution of hours throughout the year.

The data also show that less than a third of all the students in the sample performed more demanding work which offers them valuable experience that can be seen as a competitive advantage in the labour market. The share of students who performed work related to the content of their study programmes is likewise modest. Our findings about the lack of connection between the study programmes and the types of work performed by students support the results of previous empirical studies (Robotham, 2012: 70; Carney et al., 2005: 311; Broadbridge and Swanson, 2006: 166-167; ESIB, 2005: 38-39). This leads to the conclusion that the possible reinforcing effect between work and academic effort is modest or non-existing for most students.

The main purpose of the article has been to test the hypothesis that an excessive amo-

unt of student work has a negative influence on the students' academic performance (in terms of regular progression to the next year of study). The results of estimation of different variants of the probit model are consistent with prevalent finding from previous empirical studies(Kanelkoski and Pabilonia, 2010; Schrøter Joensen, 2009; Callender, 2008; Applegate and Daly, 2006; Bradley, 2006) that student employment has an adverse impact on academic performance only when hours of paid work exceed some threshold level, in our case around 940 hours per academic year or about 18 hours per week. In any case, the effect, although statistically significant, appears to be quantitatively relatively unimportant. Such weak impact is consistent with our finding that the workload of a representative student (8 hours per week) is well below the threshold.

Summing up, our empirical evidence suggests that modest employment activity of students does not harm their academic performance, implying that positive effects (through better time management, better understanding of the course content, and increased motivation, self-confidence and aspirations) prevail over the negative effect of cutting down time devoted to studies. The authors share the opinion of Hodgson and Spours (2001: 383) that students shall try to make connections between their paid work, their studies and their career aspirations in order to benefit from the advantages of student work.

The study has two limitations deserving reader's special attention. The first concerns the data used in the descriptive and regression analysis, coming from the largest student employment service in Slovenia and covering the period 2005-2008. The data used in the regression analysis refer to a fairly large sample of tertiary students, but the sample may not be completely representative for the working student population in a country. The reader should also keep in mind that the structure and the scope of the work performed by students might have changed since the onset of economic crisis in 2008 – the period not covered by the study due to limited data availability. A change in the structure of the work performed by tertiary students could have some effect on the relationship between the scope of work and academic performance.

The second limitation is related to a lack of available data or appropriate proxies that could measure students' cognitive ability, personality traits, and social and family background (e.g. parental education or income) which have previously been found to be relevant for academic performance. By not being able to control for these factors when estimating the impact of the scope of work on academic performance, we risk the omitted variable bias in the results. The bias related to ability, however, might not be very significant, as cognitive ability loses some of its power to predict the academic performance of students in higher education (O'Connor and Paunonen, 2007: 973). Moreover, introducing variables that would explain additional variation in academic performance would most probably tend to further diminish the significance of student work and would not qualitatively change our basic conclusion that the impact of paid work on academic performance is rather modest for most students.

Addressing these limitations shall be a starting point for further research. Connecting the databases of more student employment services in Slovenia and including appropriate proxies for unobserved characteristics could enhance the reliability of the results. Nevertheless, we believe our study shows the advantages of using actual data rather than surveys which were so far used in policy discussions.

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Appendix 1:

Summary statistics for the variables used in the probit analysis

Variable	Description	Number of observations**	Mean	Standard deviation	Minimum	Maximum
Dgender	Dummy taking the value 1 for females	2,363	0.611	0.488	0	1
YS2(t-1)*	Dummy taking the value 1 for the 2nd year of study	2,363	0.223	0.417	0	1
YS2(t-1)*	Dummy taking the value 1 for the 2nd year of study	2,363	0.292	0.455	0	1
YS3(t-1)*	Dummy taking the value 1 for the 3rd year of study	2,363	0.314	0.464	0	1
YS4(t-1)*	Dummy taking the value 1 for the 4th year of study	2,363	0.171	0.377	0	1
Dpt	Dummy taking the value 1 for part-time students	2,363	0.129	0.335	0	1
Study filed dummies** taking the value 1 for:						
Dfield_1	Economics, business, tourism and administration.	2,363	0.269	0.433	0	1
Dfield_2	Philosophy and other humanities and social sciences	2,363	0.248	0.432	0	1
Dfield_3	Law	2,363	0.036	0.187	0	1

Variable	Description	Number of observations**	Mean	Standard deviation	Minimum	Maximum
Dfield_4	Pedagogical faculties and sport	2,363	0.071	0.257	0	1
Dfield_5	Mathematics, physics, other natural sciences and engineering	2,363	0.060	0.238	0	1
Dfield_6	Electrical engineering, energetics, computer and information science	2,363	0.077	0.267	0	1
Dfield_7	Medicine, pharmacy and veterinary science	2,363	0.056	0.230	0	1
Dfield_8	Chemistry, biotechnology, agronomy	2,363	0.085	0.278	0	1
Dfield_9	Architecture, construction, logistics, maritime, environment	2,363	0.047	0.213	0	1
Dfield_10	Music, theatre, radio, film, television, fine and other arts	2,363	0.014	0.117	0	1
Dfield_11	Other or unknown fields of study	2,363	0.036	0.187	0	1
WORKh	Number of hours worked by a student per academic year	2,363	640	497	1	2,945
PASS	Dummy taking the value 1 for regular progression to the next year of study	2,363	0.674	0.469	0	1

Notes: *Values of lagged variables are reported (as used in the probit analysis). ** The final sample of microdata includes 2,363 observations for 1,890 students at the level of an academic year.
Source: microdata from selected employment service, own calculation.

Appendix 2:
Results of the regression analysis of determinants of the scope of individual student's work (with robust standard errors including the cluster option)

Dependent variable: ***WORKh***	Regression coefficient	P-value (P>|t|)
PASS	-0.17768	0.993
Dys2	-132.394	0.000
Dys3	-175.462	0.000
Dys4	-183.625	0.000
Dpt	287.4002	0.000
Dgender	63.41751	0.010
Dfield2 (Philosophy and other humanities and social sciences)	-168.346	0.000
Dfield3 (Law)	-311.033	0.000
Dfield4 (Pedagogical faculties and sport***)***	-305.161	0.000
Dfield5 (Mathematics, physics, other natural sciences and engineering	-151.577	0.007
Dfield6 Electrical engineering, energetics, computer and information science)	-91.1825	0.068
Dfield7 (Medicine, pharmacy and veterinary science)	-256.475	0.000
Dfield8 (Chemistry, biotechnology, agronomy)	-162.93	0.000
Dfield9 (Architecture, construction, logistics, maritime, environment)	-147.085	0.003
Dfield10 (Music, theatre, radio, film, television, fine and other arts)	-301.986	0.000
Dfield11) (Other or unknown fields of study)	-43.9173	0.543
Constant	849.1179	0.000
Adj R-squared	0.1176	
F(16, 1889), (Prob> F)	16.34	(0.000)
Number of observations (NT)	2,363	

Notes: F statistic and p-values are calculated on the basis of robust standard errors that take into account the correlation within clusters (i.e. the correlation between observations for the same students). Number of clusters equals number of students in the sample (N=1890).

Source: micro data from selected student employment service, own calculations.

Sažetak

UMANJUJE LI ZAPOSLENOST STUDENATA NJIHOV AKADEMSKI USPJEH? SLUČAJ SLOVENIJE

Tanja Kosi, Bojan Nastav, Janez Šušteršič
Fakultet za menadžment, Sveučilište u Primorskom
Koper, Slovenija

Rad analizira obilježja studentskog rada u Sloveniji i procjenjuje učinak opsega studentskog rada na uspješno savladavanje akademske godine. Nakon žustre rasprave o prednostima i nedostacima studentskog rada u Sloveniji koja se vodila tijekom posljednjih nekoliko godina, a koja se temeljila na malo rezultata istraživanja, ovo je prvi rad kojim se statistički provjerava tvrdnja da studentski rad negativno utječe na njihov akademski uspjeh. Različite varijante probit modela testiraju se koristeći velik broj podataka za reprezentativni uzorak od 1890 studenata diplomskih studija koji su u razdoblju od 2005. do 2008. godine radili posredovanjem jedne od najvećih agencija za zapošljavanje studenata u Sloveniji. Rezultati potkrepljuju spoznaju koja je zajednička prethodnim empirijskim istraživanjima iz drugih zemalja, a to je da zaposlenost studenata ima (malen) negativni učinak na njihov akademski uspjeh samo kada sati njihova plaćenog rada premašuju određenu razinu, koja je u našem slučaju 18 sati tjedno. Istraživanje isto tako pokazuje vrlo slabu sezonsku komponentu u studentskom radu, što znači da studenti rade u relativno podjednakom opsegu tijekom cijele godine. Isto tako, rad ukazuje na nepovezanost između vrste rada koje studenti obavljaju i njihovih područja studija.

Ključne riječi: studentski rad, propisi, tercijarno obrazovanje, akademski uspjeh, Slovenija.