

THE WORK-STUDY DILEMMA OF CZECH UNDERGRADUATES

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Highlights

- Family background does not influence the study workload or the working activity of students
- Self-studying contributes to the future wage twice more than studying at school or working
- Hard-working students and students with in-branch experience are optimistic about labour prospects

Abstract

This paper describes a theory of adaptive eLearning, a tool that enables an individualised instruction. First The aim of this paper is to analyse the work-study dilemma of Czech students. We examine the impact of the work and study workload on the student's expectations for their future labour market chances. For the future formal evaluation of Czech students' workload, it is necessary to take into account if the students' jobs are closely connected to their field of study, which make up the important part of their education. We used a unique dataset based on the survey EUROSTUDENT V to test this challenging question. We have found that Czech full-time students spent almost one full-time employment studying and working in one workweek. It was proven, that students who study very hard as well as students with in-branch experience are optimistic about their future labour prospects. Business-minded students especially prefer working hours to studying at school or at home. We did not discover the importance of family background to their workload with the exception of the labour-market perspectives. Furthermore we found considerable differences between men and women's work experience during their studies. Finally, according to the solution of the work-study dilemma model, we proved that while working hours are substitutes for hours spent at school, the role of self-study is irreplaceable.

Keywords

EUROSTUDENT V, ECTS, work-study dilemma model, study workload

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Introduction

One of the most crucial questions of recent tertiary education in the Czech Republic is the balance between traditional formal education at universities and students' working activities during term-time. The so called work-study dilemma (Barett, 2000) exerts pressure both on universities, which are forced to change curricula in favour of e-learning, and on the undergraduates, who feel the need to have enrolled at least a part-time job while studying.

The trade-off between the amount of time spent studying and time spent working is a challenging problem that must be worked out by every university, every class teacher and every student. The crucial question is whether the "work experience myth" is built on sand or solid rock. While there is medially grateful evidence on the employer's preferences of experienced graduates, a lot of companies actually prefer graduates who are not burdened by non-relevant work habits (compare Doležalová, 2014a).

Dadgar (2012) maintains that according to Becker's Human Capital Theory, it is optimal for individuals to get a job after completing formal education to make the investment into individual human capital fully beneficial. Scott-Clayton (2012), on the contrary, stresses the concavity of human capital productivity which leads to marginal returns from the work experience. From this point of view, a student's job during term-time can improve their soft skills, career networking and secure references (ibidem).

In short, the study-work rate challenges economic theory: if

Human Capital Theory connected with Garry Becker's research (Becker, 1962) proves to be right, then a student's study workload should be very high and their work experience should create just a marginal part of their university years. Nevertheless, if higher education was just a necessary, but not sufficient condition in terms of job market signalling (Spence, 1973), then we should call for Czech students to work more.

However, the work-study dilemma is a more complex problem that should be studied even from other points of view. As the result of a university surplus and a shortage of students, several universities accept students without entrance exams (Alina and Volek, 2014). Such measures might diminish not only the quality of freshmen, but even the study workload of students.

Our former analysis dealt with intergenerational transmission suggesting that a student's family background highly influences their non-formal lifelong learning (Fischer and Lipovská, 2013). In accordance with Denny (2011), it was mentioned that the role of information and knowledge is less appreciated in blue-collar households than in white-collar households. Therefore, it is important to analyse this question once again in terms of the formal tertiary education.

Czech media (perhaps attracted by the legendary autobiography of modern heroes such as Steve Jobs and Bill Gates) ask whether business-minded youths really need to enrol in university (Hníková, 2014). The difference between future employers and employees might be detected even in the solution of their work – study dilemma.

Although tertiary education at Czech public universities is free of charge, it does not mean it is completely without expenses. The cost of living (as well as opportunity costs) forces full-time students to work, at least partly. It is demanding to analyse the relationship between the reason for the student's work and their study workload.

The aim of this paper is to present the work – study dilemma as solved by the Czech students, using data from the survey EUROSTUDENT V¹. The rest of the paper is organized as follows. We introduce the data and the statistical methods we used. We then present the results of our analysis. Firstly, the study workload from the perspective of study field, reasons for work, students' attitude towards business and university entrance requirements is discussed. Secondly, we analyse the relationship between study field and current job in terms of gender, chances on the labour market and wages. Then we focus on family background and study workload. Finally, the work-study dilemma model is researched.

Materials and Methods

Our research is based on high quality and unique data from the survey EUROSTUDENT V, which was conducted in 2013 over all Czech public and 29 private universities. The questionnaire was sent to 95 177 undergraduate full-time and part-time students, with the response rate below 7%. After removal of uncompleted or insufficient questionnaires, our dataset consists of 4 664 respondents (Fischer and Vltavská, 2013). The great deal of questions from the survey EUROSTUDENT V used a type of the 5-point or 6-point Likert scale.

For the purpose of our analysis the optimal week study workload was computed. The Bologna Declaration of 1999 (Ministry of Education, Youth and Sports, 1999) supports the European Credit Transfer and Accumulation System (ECTS). It has been suggested that one term should consist of 30 ECTS on average, with 1 ECTS being from 25 to 30 lessons (1 lesson = 45 minutes). Based on the schedules of 11 Czech universities², the 20 week term³ is standard. One ECTS is considered to be 26 lessons (see Mazouch and Fischer, 2011). The average weekly study workload in hour is computed as:

$$\text{study workload} = \frac{\text{lessons} \times \text{TOTAL ECTS} \times \frac{45}{60}}{\text{weeks}} = \frac{26 \times 30 \times \frac{45}{60}}{20} = 29.25 \sim 29 \text{ hours.}$$

The study workload is then divided into 5 categories. The first category covers the workload that is lower than half of the optimal week study workload. The second one stays for more than half of the optimal hours. In the third category, there are students whose studies during the workweek are exactly the optimal workload. The fourth category includes students who study longer than 29.5 hours but less than 40 hours. Finally, the last category contains students whose study workweek is longer than the standard Czech labour workweek.

study workload [hours]	intensity
(0, 14.5>	very low
(14.5, 29>	low
(29, 29.5>	enough
(29.5, 40>	high
(40, 146>	very high

Tab. 1: The study workload intensity in five categories

Variable *wage*, as a proxy for wages which can be expected by students of different programmes on the Czech labour market, was taken from the report based on the REFLEX 2010 survey (Koucký and Bartušek, 2012). As the dataset for the recent labour market situation was not available at the time of writing, the *wage* variable from 2010 was considered mainly as the relative one. Using the average wage on the Czech labour market in the 4th quarter of 2010 (25 803 CZK, CZSO, 2011), we create the new dummy variable acquiring a value of 1 for the above-average wage and value of 0 for the below-average wage.

The dummy variable *exam* reflected whether the respondents had to pass entrance exams, including aptitude tests or General Record Examination (GRM) or if they had enrolled either without any requirements or were accepted due to their former study results.

The original dataset was narrowed down to a subset of 3 852 respondents – full-time students – who answered the questions on their study workload.

The study workload, as a share of the total workload is computed as

$$\text{study workload share} = \frac{h_{sh} + h_{ss}}{h_{sh} + h_{ss} + h_w} \quad (1)$$

where h_{sh} is the amount of hours spent on self-study during the work-week, h_{ss} is the weekly amount of hours of formal education at school and h_w stands for time spent weekly by working in paid job.

We have used standard statistical methods as the analysis of variance and non-parametric tests (Budíková et al., 2010). For the nominal and ordinal data, correspondence analysis was used (Řezanková et al., 2009).

Work-study dilemma model (WSDM)

To solve the work-study dilemma, the following model was derived. Suppose that tertiary education consists of two interconnected effects, which are revealed due to the labour market.

This is based on the equation of wage and marginal product of labour $w = MLP$. The first effect is the “diploma effect” as the result of Spence's job market signalling theory. According to this effect, the worker receives higher wage because of the wage premium – the wage differential σ between the average wage of a lower-educated worker w_L and higher-educated worker w_H :

$$\delta = w_H - w_L \quad (2)$$

Based on the average-wage data published by the Czech Ministry of Labour and Social Affairs (table 2) it is obvious, that whole differential is not the result of pure diploma effect as the average revenue of one bachelor's study hour is disproportionate to the average revenue of one master's study hour.

¹ This survey was lead in the Czech Republic within the project IPn KREDO CZ.1.07/4.1.00/33.0005.

² Charles University in Prague; University of J. E. Purkyně, Ústí nad Labem; Prague University of Economics, Prague; Czech Technical University in Prague; Masaryk University; Czech University of Life Sciences; University of South Bohemia in České Budějovice; University of West Bohemia in Plzeň; Institut of Chemical Technology in Prague and Technical University in Liberec. These schools create 77% of our dataset.

³ Including the examination period.

	average wage [CZK]	wage differential [CZK]	study workload [hours]	average revenue [CZK]
upper secondary	23 319	-	-	-
bachelor's degree	27 199	3 880	3 510	1.105
master's degree	37 215	10 016	5 850	2.375

Tab. 2: Average revenue from one hour of compulsory study according to the degree. Source: Czech Ministry of Labour and Social Affairs

To get the total differential, we must include the second effect. The second effect is the marginal revenue from the additional hour spent on studying ρ_s and the marginal revenue from the additional hour of paid work ρ_w . This marginal revenue is measured purely in terms of human capital, it is not connected to the financial income, so $w \neq \rho$.

We assume that the hour of study h_s is to a certain extent a substitute for the hour of work h_w . If this hypothesis was valid, than we could expect the relationship to be as follows:

$$\rho_w = k_{\rho_s}, k \neq 0 \tag{3}$$

with k being the constant.

For the purposes of our analysis, it is appropriate to split the total amount of hours spent on studying h_s into the time spent on attending formal courses at school and time devoted to self-study:

$$h_s = h_{ss} + h_{sh}$$

The challenging problem is how to estimate corresponding coefficients ρ_{ss} , ρ_{sh} and ρ_w . The equity (3) can be modified in the following way:

$$\rho_w = k_h \rho_{sh}, k \neq 0 \tag{3.1}$$

and

$$\rho_w = k_s \rho_s, k \neq 0 \tag{3.1}$$

It is obvious that none of the undergraduates know the exact relationship between the work and study, but they assume that future employers require either sufficient work experience or excellent academic results. Every rational student is then optimizing within their time budget line the work-study ratio according to their personal abilities, preferences, knowledge and expectation. Following the philosophy of Hayek (1945), we assume that from the individual choices of appropriate bundle $[h_{sh}, h_w]$ the optimal relationship between ρ_{sh} and ρ_w can be computed. If h_{ss} is approximately common for all students of a certain subject with (reflecting the “diploma effect”), than we can estimate the coefficient using the ordinary least square model without intercept:

$$\delta = \rho_{ss} h_{ss} + \rho_{sh} h_{sh} + \rho_w h_w + \varepsilon \tag{4}$$

The corresponding estimators are then r_{ss} , r_{sh} and r_w . The relationships between these coefficients are tested by the Fisher F-test (Heij et al., 2004).

Results

This section is divided into four chapters. Firstly we deal with the study workload in light of the field of study, reasons for work, university entrance requirements and students’ attitude towards running their own business. Secondly, we analyse the wage perspectives according to the students’ self-evaluation of their labour market chances, their work experience and gender. In the third part, we discuss the relationship between students’

family background and their study as well as the job workload. Last but not least, we present the results of our work-study dilemma model.

Study workload

Field of study

Part-time students should be able to study approximately 11 hours more than full-time students during weekends to fulfil the optimal study workload of 29 hours per week. Full time students spent 37 hours during the workweek studying and working in paid jobs and part-time students study and work a total of 49 hours during workweek. T-test for independent samples confirms that a significant difference between the study intensity of full-time students and part-time students exists.

Figure 1 clearly shows that the full-time students of Healthcare sciences and Pharmacy accomplish nearly the whole optimal workload during the workweek; on the other hand students of Law and Economics should spend approximately 8 – 10 hours studying during weekends. The narrowest difference between the weekend overload of full-time and part-time students is in Art, and the widest in Natural sciences.

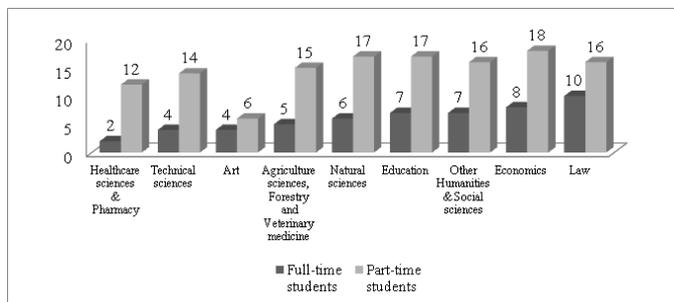


Fig. 1: How many hours should full-time and part-time students study during weekends to fulfil the optimal 29-hours-quota? Categorisation according to field of study.

The correspondence map (fig. 2) visualizes the relationship between study workload during the workweek and the field of study (because the 2nd dimension explains 90% of the whole inertia, we can focus just on the horizontal relationship). While the highest workload is connected with full-time Healthcare and Pharmacy study programmes (more than 40 hours per week), students of Law, Economics, other Humanities and Social sciences spend less than 14.5 hours studying during the workweek.

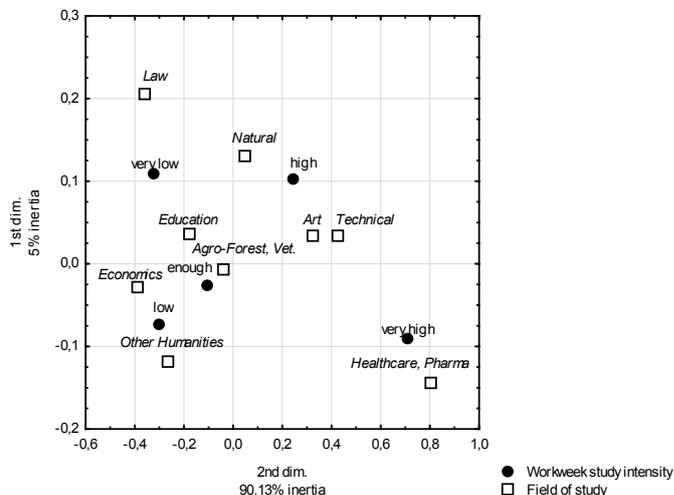


Fig. 2: Association between workweek study intensity and field of study

Full-time students who are studying hard during the workweek

consider their chances on the Czech labour market as very good, students who studied exactly the optimal 29-29.5 hours consider their chances being fair (fig. 3).

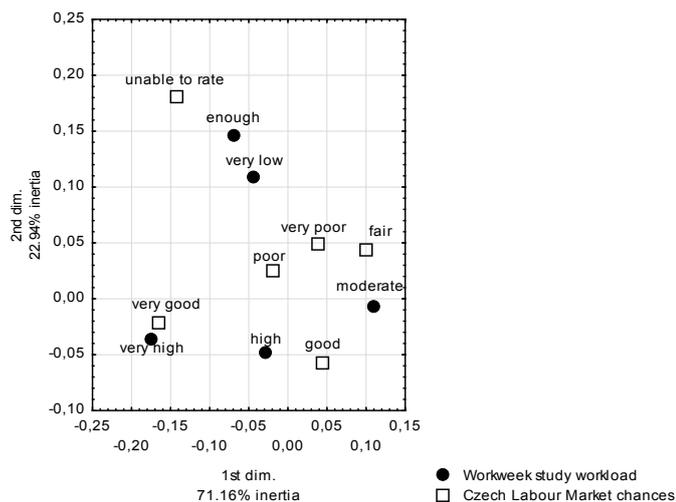


Fig. 3: Association between workweek study workload and evaluation of chances on the Czech labour market

Students, whose job is very closely connected to their field of study, spend in the workweek just a little time studying. On the other hand, if the intensity of studying is very high (more than 40 hours workweek), there is not a close relationship between their job and field of study. In this case, the term job is a clear substitute for formal education.

Other important factor is the satisfaction with the university. Students, who claim they would enrol in the same school again, study 29 hours a workweek in comparison to 27 hours for students who would never chose their school again. Moreover, satisfied students find their labour-market chances significantly better – on the scale from 1 (very good chances) to 5 (very poor chances) they evaluate their chances as 2.3, which is 0.6 point better than unsatisfied students.

Reasons for work

Two subsets were separated from the set of working full-time students: (i) students who work only to earn for a living, but not to gain work experience and (ii) students who work only to gain work experience but do not need to earn for a living. We find evidence, that the “must-work” students not only work 8 hours longer than students working to get experience, but they even study 6 hours longer. This might show, that the work is for students a kind of substitute for education.

Students who work just to get more work experience also find their labour-market chances significantly better than students working for money. Their jobs are also much closer to the field of their study than jobs of students who work to earn for a living (fig. 4).

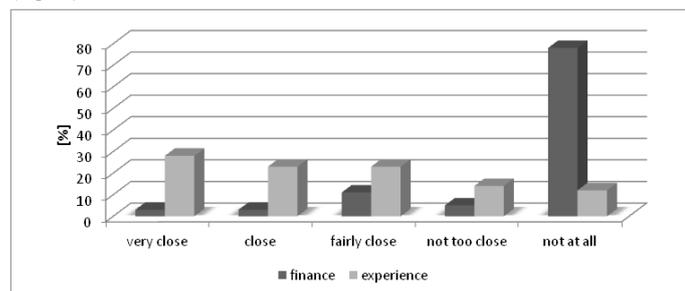


Fig. 4: The job-study relation in light of the prevailing reason to work

Full-time students could even evaluate whether they

are primarily the students who work just in their free-time, or if they see themselves specifically as workers who study as an extra activity. Full time students, who describe themselves as mostly students, study 11 hours a workweek longer and work 23 hours a week less than full-time students who consider themselves to be workers who study (see tab. 3).

	study workload	work workload
student with other activities	28	8
work and study in free time	17	31

Tab. 3: Study and work workload according to the self-evaluation of full-time students

Entrance exams and the study workload

According to the analysis of variance results, there is a significant impact caused by university entrance requirements. Students who did not need to take the entrance exams study significantly more than students, who passed the exams, aptitude or GRM tests. The difference is almost 2 hours a week (31.1 hour vs. 28.7 hour), which is 1.6 ECTS per term.

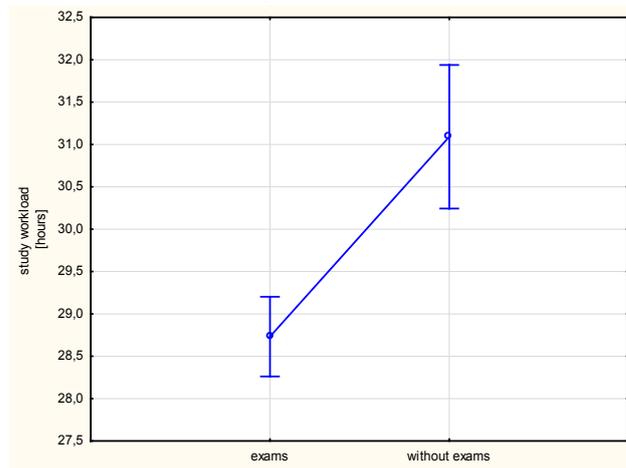


Fig. 5: College admission and study workload

Business-minded students

The amount of students who plan to start a business after graduation, was in our dataset very low (40 respondents only). Nevertheless, the analysis of variance shows a significant gap between the workweek study workload of “future employees” (30 hours) and “future employers” (22 hours). This difference is even more pronounced in terms of the whole term – it creates 5.5 ECTS credits. The “missing hours” are clearly the result of a higher job workload for business-minded students. They work 12 hours a week longer than other students (22 hours in comparison to 10 hours). Surprisingly, both groups of students have the same expectations for their future labour market prospects.

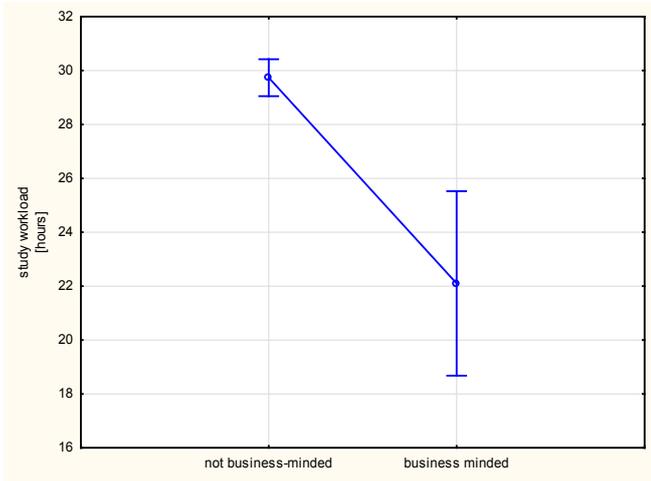


Fig. 6: Study workload of business-minded and non-business minded students

Field of study and the labour market

There exists a moderate relationship between the wage level (typical for the study programme) and the chances students consider to have on the Czech labour market (Cramer $V=0.20$). Students of programmes with significantly higher wages evaluate their chances on the Czech labour market as very good or good. Students who evaluate their labour-market chances as fair or poor can expect lower wages. However, there is not a statistically significant difference between the expected wages of full-time students who consider their chances on the Czech labour market as very poor and those who are unable to rate their chances (fig. 7).

Full-time students, who do not have a paid job during semester time, study during the workweek significantly more (31.5 hours) than students who work (25.5 hours).

Full-time students are more confident in terms of getting a job in the national labour market if their recent work is related to the content of their study programme (fig. 8). Students, whose job is not closely related to their study, evaluate their labour market chances as fair or poor or they are unable to rate them at all.

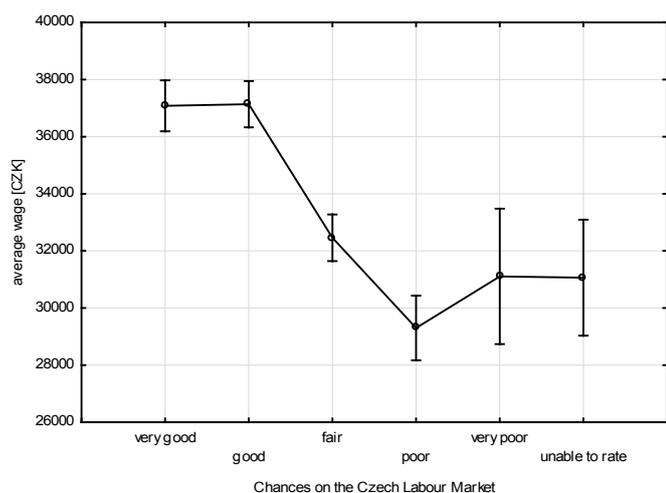


Fig. 7: Students evaluation of the Czech labour market chances and the average wage they can expected

Gender

There exists a significant relationship between the sex of students and relationship of their job to the content of their study programme. Male students tend to work during their studies more often in the field of their study than women (Cramer $V =$

0.19). While 44% of working male students work in a job very closely or closely related to their study, 40% of female-students work in a branch that has nothing in common with their study field. In total, 67% of female students study in a programme in which graduates have a below-average wage. On the contrary, 59% of male students major in a field, for which is typical an above-average wage.

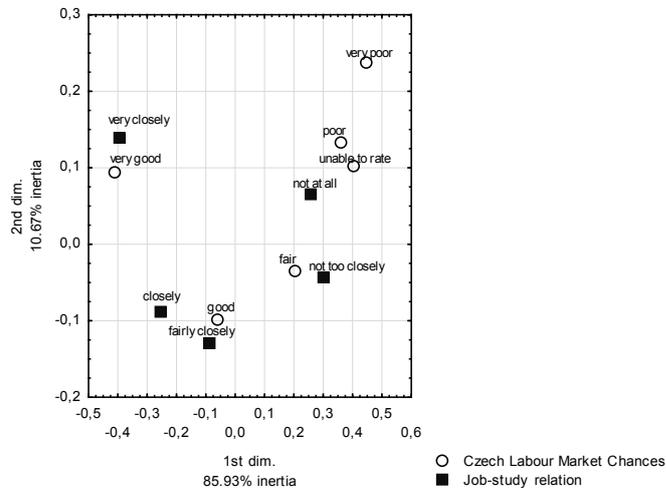


Fig. 8: Labour market chances in light of the job-study relation

Family background

According to the results of analysis of variance, family background does not influence the study workload or the working activity of students. Students with at least one white-collar parent do not study more than students with both blue-collar parents. On the other hand, students from white-collar families evaluate their chances on the labour market better than students from blue-collar families.

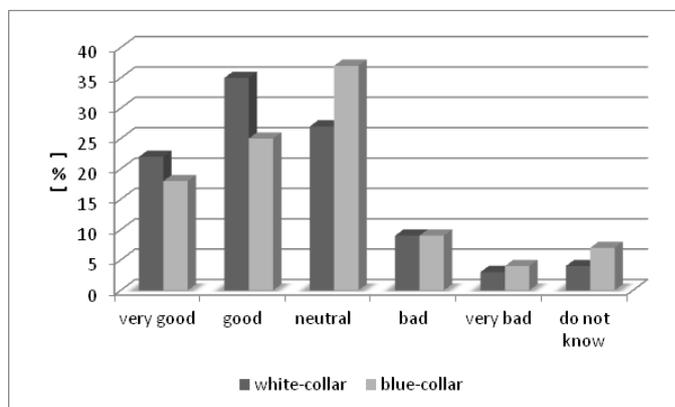


Fig. 9: Ranking the labour-market chances according to their family background (white-collar vs. blue collar parents)

Very similar results can be achieved when we focus on the initial education of students' parents. Children with both parents with tertiary education devote the same effort to work and study as children from families where both parents reached just primary or lower secondary education. Nevertheless, children of tertiary educated parents are much more optimistic in terms of their labour-market chances.

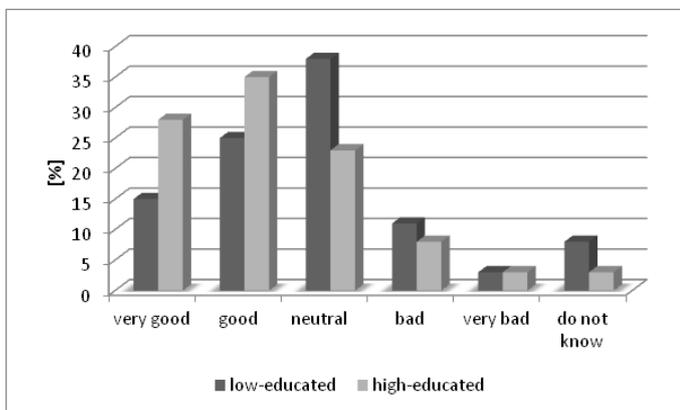


Fig. 10: Ranking the labour-market chances according to their family background (low-educated vs. high-educated)

Work-study dilemma model

Using the equation (1) we computed the share of full-time students’ study workload on their total working time (time devoted to paid work, studying at school and self-studying). It is clear from fig. 11 that more than half of full-time students really study full time (80% - 100% of their total working time). Full-time students spent 38 hours on average weekly working or studying. Students with a higher share of study time work considerably less and self-study 7-times more than the “hard-workers” from the 1st quintile. However, the total working activities (including studying) of students from the 1th quintile are 8 hours longer than the activities of students from the 5th quintile.

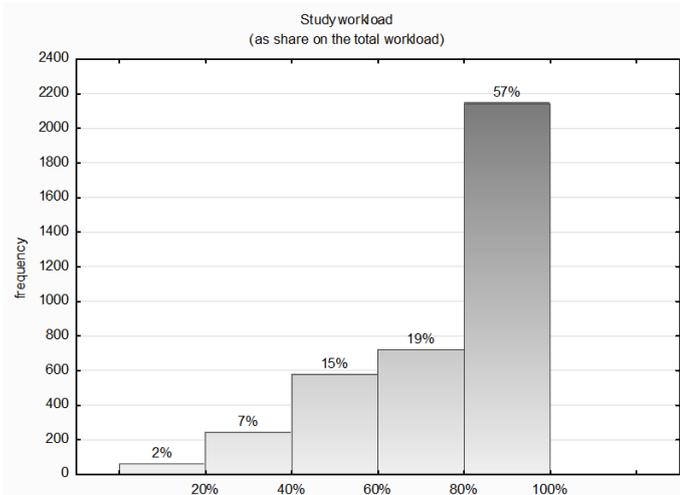


Fig. 11: Quintile histogram of full-time students’ study workload as a share of their total workload

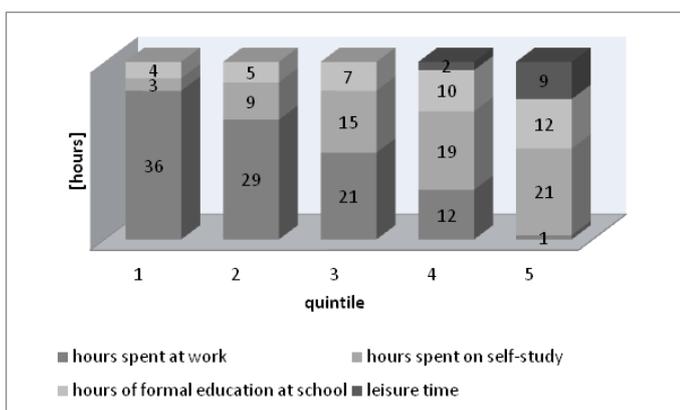


Fig. 12: Structure of full-time students’ workload

The solution to the WSDM (4) using the Newey-West estimator is

$$d = 0.065h_{sh} + 0.037h_{ss} + 0.036h_w,$$

with the coefficient of determination⁴ being $R^2 = 0.86$. Fisher F-test confirmed the solutions of equity (3.1) and (3.2) which is $k_h = 1.75$ and $k_s = 1$. It means that 100 hours of self-studying contributes to the future wage twice more than 100 hours of studying at school or 100 hours of work.

Discussion

If we consider standard full-time employment in the Czech Republic to be 40 hours, then full-time students study and work is almost at full-time employment level. On the other hand, part-time students need to spend 15 hours per weekend studying to fulfil the 29 hour quota, which is equivalent to a full-time job 7 days a week. This great time burden might be the main cause of part-time students’ weaker study workload.

The differences in study workload in specific fields are in line with the greater number of compulsory lectures in Healthcare and Pharmacy in comparison with Law or Economics. This is in accordance with Ryška and Zelenka (2011) who analysed the total amount of hours spent weekly (including the examination period and weekends) on studying. In this research, both medical students and students of technical sciences devoted to their studies more than average time (more than 34 hours) and students of Economics and Law studied the below the average.

According to the Alina and Volek (2014), there is a relationship between the form of college admission and the success of students in key compulsory subjects taught in the very first term. Students who needed to pass an entrance exam did significantly better than students who enrolled without any examination. On the contrary, our results suggest that students who enrolled without exams worked harder. Three different explanations might be suggested for this: (i) Students who enrolled without exams might have a lower initial level of human capital as they possibly did not manage to pass the entrance exams at other schools. Those students need to work harder to catch up with the required human capital level. (ii) Students enrolled without exams are students with excellent secondary-school results. Rubešová (2009) mentions that such students tend to be more successful even at university. They might study harder not because of the catch-up effect, but because of their positive attitude towards studying. (iii) Students enrolled without exams are mainly students of Technical sciences (67% of students in technical colleges did not need to pass an exam) or Agriculture sciences, Forestry and Veterinary medicine (43% of students without entrance exams). However, those students’ study workload was (together with students of medicine) the highest found (see fig. 1). Bearing those three points in mind, the higher study workload of students who did not need to pass entrance exams is perfectly clear.

For the future of the Czech national economy, it is threatening that, according to the survey, business-minded students count for just a small part of Czech undergraduates. One of likely explanations for this might be that the survey data is biased, as the business-minded students are perhaps not motivated enough to fill in a survey questionnaire. On the other hand, it is clear that students who want to run business find the marginal revenue from one additional lesson of study lower than from one additional hour of paid work. This is in line with Scott-Clayton’s suggestion (2012).

⁴ It is important to note, that the coefficient of determination does not have a great informational value in the OLS model without intercept.

The job-study relationship among male and female students could be a latent factor that models wider wage differences between men and women. Moreover, female students more often study programs in which graduates have significantly lower wages. While, in our dataset, the typical female branch is Education (the field with the highest rate of below-average wages), females create only 28% of law students (with law being one of the best-paid fields). This is in line with Chalupová and Borůvková (2012) who remark that for Czech male students' the three key factors in choosing their profession are career security, prestige and profitability.

Similarly as Šimková, Švarcová (2014) we have tested the importance of family background on students' lives. According their findings, students from low social classes work more often than students from higher classes, however, this is inconsistent with our results. The main reason might be that while their evaluation of family background was based on the students' self-assessment (a subjective evaluation), we used an objective evaluation – parental level of education and type of job. There is a clear impact of the family background on the labour-market perspectives. Children from white-collar and better educated families are more optimistic, possibly because of their parents' higher social capital (including a better social network). This is consistent with the results of several surveys led by particular Czech universities (e.g.: Masaryk University or Mendel University). According those results, the role of parents in finding the first job is irreplaceable. They found that from 10% to 23% jobs are found only thanks to the social network of the family (Diatelová, 2014, Mendelu 2010).

Our findings on work-study dilemma model are rather unexpected. While one hour of work is a substitute for an hour of formal studying at school, one hour of self-study is much more beneficial than both the formal education and working experience. Based on those results, the proclaimed importance of working experience is overrated. These findings are consistent with the requirements of employers (tab. 4) who actually do not expect work experience from graduate students.

	secondary	tertiary	quaternary
graduate	1,1 %	8,2 %	8,8 %
experienced worker	9,4 %	87,0 %	86,1 %

Tab. 4: Requirements of employers on graduates and experienced workers (Source: Doležalová 2013, Doležalová and Vojtěch 2013 and Doležalová 2014a, 2014b)

Conclusion

In this paper, the measurement of students' workweek workload is based on the optimal quota of 29 hours which students should spend studying at school and at home. There are great differences in the amount of study among the fields covered. The number of study hours depends also on the student's participation in the labour market.

We have discovered that wage differences during the working career might have their roots in undergraduates' activities. Women tend to enrol in study programs for which below-average wages are typical. Furthermore, they lose the opportunity to enhance their work experience when they work on jobs that have nothing on common with their field of study.

This paper is a further contribution to the discussion on the need for closer links between formal education and work experience. It is obvious that students who work in the field of their study consider one hour of work to be a substitute for one hour of

formal studying, and are more optimistic in terms of their future career. Nevertheless, the rule of self-study cannot be ignored in the time management of the individual student. This should be taken into account when computing the compulsory ECTS for the Czech universities.

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References

- Alina, J. and Volek, T. (2014) 'Impacts of cancellation the entrance examinations on courses economics' *Proceedings of the 11th International Conference on Efficiency and Responsibility in Education (ERIE 2014)*, Prague, pp. 11 – 18.
- Barrett, S. (2000) 'The work/study dilemma: A pilot survey'. *International Education Journal*, vol. 1, no. 1, pp. 127 – 137.
- Becker, G.S. (1962) 'Investment in Human Capital: A Theoretical Analysis', *The Journal of Political Economy*, vol. 70, no. 5, pp. 9-49.
- Budíková, M. et al. (2010) *Průvodce základními statistickými metodami [Guide to basic statistical methods]*, Prague: Grada Publishing, a.s.
- Chalupová, M. and Borůvková, J. (2012) 'Research on willingness to study nursing, education and social work among senior male students in Vysocina region'. *Journal on Efficiency and Responsibility in Education and Science*, vol. 5, no. 2, pp. 63-77.
- CZSO [online]. Available: <http://www.czso.cz/csu/csu.nsf/informace/cpmz030911.doc> [9 March 2013]
- Dadgar, M. (2012) 'The Academic Consequences of Employment for Students Enrolled in Community College', *CCRC Working paper*, no. 46.
- Denny, K. (2011) 'Do Teachers' Children Do Better at School?', *Regional and Sectoral Economic Studies*, vol. 11, no. 3, pp. 119 – 134.
- Diatelová, I. (2014) 'Absolventi a práce? Spokojenost [Graduates and work? Satisfaction]', *Atrium*, no. 3, pp. 3.
- Doležalová, G. (2013) 'Postoje zaměstnavatelů k zaměstnávání absolventů škol (Zpráva ze šetření zaměstnavatelů v technických odvětvích)' [Attitudes of Employers to Employ Graduates (Report on survey of employers in the technical sector)], Prague: NÚV
- Doležalová, G. and Vojtěch, J. (2013) 'Potřeby zaměstnavatelů a připravenost absolventů škol – šetření v sekundárním sektoru' [Needs of employers and readiness of graduates – secondary sector survey], Prague: NÚV
- Doležalová, G. (2014a) 'Potřeby zaměstnavatelů a připravenost absolventů škol – šetření v terciárním sektoru' [Needs of employers and readiness of graduates – tertiary sector survey], Prague: NÚV
- Doležalová, G. (2014b) 'Potřeby zaměstnavatelů a připravenost absolventů škol – šetření v kvartérním sektoru' [Needs of employers and readiness of graduates – quaternary sector survey], Prague: NÚV

- Fischer, J. and Lipovská, H. (2013) 'Building human capital: the impact of parents' initial educational level and lifelong learning on their children'. *Journal on Efficiency and Responsibility in Education and Science*, vol. 6, no. 4, pp. 218 - 231.
- Fischer, J. and Lipovská, H. (2014) 'The path to the labour market: Czech students, their study workload and work experiences.' *Proceedings of the 11th International Conference on Efficiency and Responsibility in Education (ERIE 2014)*, Prague, pp. 118 – 124.
- Fischer, J. and Vltavská, K. (2013). EUROSTUDENT V: 'Základní výsledky šetření postojů životních podmínek studentů vysokých škol v České republice.' [EUROSTUDENT V: basic results of the survey among students at the Czech HELs] Prague. Available: <http://kredo.reformy-msmt.cz/viewdownload/1-ipn-kredo/14-eurostudent-v-zakladni-vy-sledky-setreni-postoju-zivotnich-podminek-studentu-vysoky-ch-skol-v-ceske-republice>
- Hayek, F. A. (1945). 'The Use of Knowledge in Society'. *American Economic Review*, vol. 35, no. 4, pp. 519 – 530.
- Heij, C. et al. (2004). *Econometric Methods with Applications in Business and Economics*, New York: Oxford University Press.
- Hníková, E. (2014). 'Je vzdělání k ničemu?' [Is Education Useless?] *Ekonom: Týdeník Hospodářských novin*. Praha: *Economia*, a.s., vol. 58, no. 25.
- Koucký, J. and Bartušek, A. (2012). 'Funkce a profily veřejných vysokých škol v ČR 2012' [Function and profiles of public universities in the Czech Republic] Prague: Charles University.
- Mendelu (2010). 'Průzkum uplatnění absolventů Mendelovy univerzity v Brně' [Survey on the employability of graduates of the Mendel University in Brno] Brno: Mendel University.
- Ministry of Education, Youth and Sports (1999) *Bologna Declaration*, Available: <http://bologna.msmt.cz/bologna-1999/bolonska-deklarace>
- Mazouch, P. and Fischer, J. (2011) *Lidský kapitál – měření, souvislosti, prognózy* [Human capital – measuring, context, prognosis] Prague: C. H. Beck.
- MPSV [online]. Available: <http://www.mpsv.cz/ISPVchara.php> [30 June 2014]
- Rubešová, J. (2009) 'Souvisí úspěšnost studia na vysoké škole se středoškolským prospěchem?' [Is the success at college connected to the results from the secondary school?], *Pedagogická orientace*, vol. 19, no. 3, pp. 89 – 103.
- Ryška, R. and Zelenka, M. (2011) 'Absolventi vysokých škol: hodnocení vzdělání, uplatnění na trhu práce, kompetence' [College Graduates: Assessment of education, labour market enforcement, competence], Prague: SVP, Charles University
- Řezanková, H. (2009) *Shluková analýza dat* [Cluster data analysis] Prague: Professional Publishing.
- Scott-Clayton, J. (2012) 'What explains trends in labor supply among U.S. undergraduates?', *National Tax Journal*, vol. 65, no. 1, pp. 181 – 210.
- Šimková, M. and Švarcová, P. (2014) 'Undergraduate Students From Families With Low Social Standing', *Proceedings of the 11th International Conference on Efficiency and Responsibility in Education (ERIE 2014)*, Prague, pp. 720 – 727.
- Spence, M. (1973) 'Job Market Signaling', *The Quarterly Journal of Economics*, vol. 87, no. 3, pp. 355 – 374.