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Working while enrolled in a university: Does it pay?

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Abstract

Working while studying at university increases the time-to-degree and may interfere with learning, but the acquired work experience may also improve employment opportunities and increase wages after the graduation. This study examines how university students' employment decisions affect their labor market success after the graduation. The study is based on an individual panel data set of Finnish university students. The data set covers the years 1987-1998, which was a period of significant changes in the Finnish labor market. The study finds that in-school work experience increases graduates' earnings at the beginning of the career, but there are no statistically significant persistent effects on employment or earnings after controlling for the selection bias in work experience acquisition.

Theme: Education and training

Key words: university, in-school work, earnings

JEL Classification: J2, J3, I2

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1. Introduction

Working while studying is everyday life for a substantial proportion of European students. The fraction of students in employment varies from 48 percent in France to 77 percent in the Netherlands. On average, European working students spend 11 hours per week in paid employment and receive between 31 and 54 percent of their total income from employment (Euro Student 2000). Finland is no exception what comes to student employment. Roughly half of the Finnish students work while enrolled in a university. Students who work spend about 20 hours a week in employment and cover about half of their living expenses by income from employment.

Students are a noteworthy part of the labor force, and student employment is a highly debated issue because of the gains and losses it generates for the individuals as well as the society. From the society's point of view, students provide a flexible reserve for labor. Student workers often work part-time and can adjust their working hours to the current labor market situation. Students tend to increase their labor supply during the economic booms when jobs are easier to find, and reduce working during the downturns when the labor markets get tighter.

An individual may choose to enter the labor market prior to graduation for several reasons. Many students are dependent on the extra income, but employment may also be a chance to invest in income-enhancing skills that are not provided at university. Work experience in the field of study may complement the formal education and improve study motivation. Student workers might also improve their job search and interpersonal skills, get familiarized with the world of work and gain sense of responsibility, all of which are valuable skills also in their later career. Potential future employers might regard work experience as a signal for other attributes, e.g. high motivation and ability, and labor market contacts improve employment opportunities after graduation. In most fields of study, university education does not prepare students for one specific job and therefore appropriate work experience may be essential for finding a job after graduation. In a survey on students of the University of Helsinki, labor market contacts were reported as the most important reason for working during the enrollment, and 42 percent of those who worked had a job related to the study field (Härkönen 2001).

Student employment has also negative effects. There is a clear trade-off between working and studying and students engaged in working use considerably less time on their studies. Work during the semesters may interfere with learning and academic performance, and may even encourage students to drop out. If the enrollment in the university is not restricted, working usually leads to longer times-to-degree.

Finnish university students who do not work use 35 hours per week on study-related activities, whereas working students use only 19 hours per week on studying (Lempinen & Tiilikainen 2001). The times-to-degree in Finland have shortened slightly in the 1990s, but the median completion time of a Master's degree is still more than one year longer than the target duration. Häkkinen and Uusitalo (2003) found that working is one of the main reasons for prolonged studies and the decrease in times-to-degree is mainly due to the higher unemployment that decreased students' employment opportunities. The population in Finland is ageing rapidly and many predictions show that in order to be able to finance the Finnish welfare state there will be an increasing pressure to extend the length of the working careers and increase the labor supply. Students' part-time employment decreases the total labor supply because it prolongs the studies and shortens the career after graduation. Thus, students might be allocating their time non-optimally and they might receive higher total earnings by completing their studies in time and working at graduate level jobs.

The essential question is whether the gains from working are larger than the distortion effect it has on achievement at university and on study time. This study estimates the return to in-school work experience at the beginning of the working career after graduation using a rich panel data set of about 3,900 individuals. The data are constructed from the Employment Statistics of Statistics Finland and cover the years 1987-1998. Using the local unemployment rate during the studies as an instrument for the work experience acquisition and comparing graduates with equal times-to-degree, the study finds that one additional year spent working yields a considerable increase in earnings one year after graduation, and the effect is positive and decreasing but statistically insignificant in the later years. However, it is likely that working increases study times and taking this into account, the effect of work experience on earnings is much lower and statistically insignificant for all years. There are no statistically significant effects on the employment probability if the selection in the experience acquisition is considered.

The rest of the paper is organized as follows. Previous literature on the returns to in-school work is discussed in Section 2. Section 3 describes the data sets used. The features of student employment in Finland are discussed in Section 4. The theory and econometric methods are described in Section 5. Section 6 provides the estimation results and Section 7 concludes.

2. Previous literature

Ruhm (1997) provides a thorough survey of the effects of working during school on subsequent labor market outcome. Most of this literature considers the effects of high school employment and typically finds that work in high school is associated with higher future earnings. However, it is important to examine whether these estimated effects are causal or simply spurious correlations. Many of these studies do not adequately (or at all) control for the potential endogeneity of the work decision or the number of hours worked. The estimated effects might merely reflect the persistent role of unobservable differences in ability or preferences that influence both the likelihood of working in high school and the later success in labor market. This could explain why many studies have found very persistent returns to in-school work even though the returns should diminish as individuals get more experience in the graduate labor market.

Less research has been done on the effects of working during higher education even though working is more common at an older age and work experience acquired near the entry to the graduates' labor market is probably more important factor determining the success in the later career than early work experience. Light (2001) attempts to separate the effects of schooling and in-school work experience on post-school wages and finds that students who accumulate work experience while in school begin their post-school careers earning 10 - 18 % more than their counterparts who gain no in-school work experience. Hotz, Xu, Tienda and Ahituv (2002) study the effects of working while in high school or college on subsequent wages of men by estimating a dynamic discrete choice model. Hotz et al. find that including a relatively rich set of background conditions and indicators of labor market conditions in wage equations reproduces the positive effects of working while in school on subsequent wages found in previous studies. However, the effects are diminished in magnitude and statistical significance once the unobserved heterogeneity is taken into account using a random effects specification.

There are also a few studies that have looked on how working affects academic performance or the quality of jobs after graduation. Paul (1982) and Stinebrickner and Stinebrickner (2003) find that working is detrimental to academic performance in college, Hood, Craig and Ferguson (1992) find that grade point averages are highest among students with moderate amounts of work, and Ehrenberg and Sherman (1987) find positive effects of working in on-campus jobs but negative effects of working in off-campus jobs. Häkkinen and Uusitalo (2003) studied the student financial aid reform and the changes in times-to-degree in Finland and found that working has a negative effect on graduation. Hämäläinen (2003) states that in-school work experience may have non-linear effects on the quality of graduate employment. Her results show that Finnish university graduates with moderate amounts of in-school work experience in the study field have jobs that match their education, but having more than 33 months of in-school work experience in the study field has a negative impact on the job match. Time-to-degree or number of credits achieved at the university have no effect on the quality of employment in the study.

Previous studies have considered the return of in-school work experience for men. Since more than half of the university students in Finland are female, studying only the effects of working for men is not justified. In addition, most of the previous studies do not control the field of study. The returns to schooling differ across the fields of study and the amount of work experience the student is able to acquire during the enrollment also depends on the field of study because the employment possibilities are not uniform across the fields and the organization of the course work affects the possibility of working during the academic year.

3. Data

This study uses data from the Employment Statistics (ES) of Statistics Finland. The data cover the whole population and contain information on individual income, employment, education, household composition etc. All data in the ES are register based. The study uses a research database that the Statistics Finland has created by drawing a random sample of 350,000 individuals, aged between 12 and 74 in 1990, from the ES. This sample is representative and includes approximately eight percent of the population in the relevant age.

The research database is a panel and individuals in the data are followed from 1987 to 1998.

From the ES sample, all university students who started their studies after 1986 are selected. The first enrollment year is restricted to 1987, because the data do not include any information on individuals before this year, and thus, the accumulated in-school work experience cannot be calculated for earlier cohorts. First, the study concentrates only on the graduates because the labor market for non-graduates and graduates might be very different and, thus, graduates and dropouts are poor comparison groups. There are about 3,700 graduates in the sample. Second, the study looks at earnings of all individuals in the data set eight and ten years after the first enrollment year regardless of their graduation status (starting cohorts of 1987-1990, roughly 3,900 individuals). A student with a good job that does not require a completed degree may not graduate at all or it may affect the timing of the graduation. Therefore, it is also important to examine the labor market outcome of all individuals and not only the outcome of graduates.

For the sample, information is collected on each student's months of employment, total annual earnings, enrollment information, name of the university where enrolled, field of study, university graduation date, and the degree achieved. In addition, student's gender, age, marital status, presence of children, and area of residence are recorded. For the time-variant variables these data are collected for each year between 1987 and 1998. Students whose initial education in the first enrollment year is higher than upper secondary education are excluded from the sample. The work experience acquired before the university studies cannot be controlled for, but after controlling for age and excluding individuals with prior tertiary level education this should be a minor problem.

In the ES data the students can be linked to their parents. Data on the parents' income and education was available for most of the students. The incomes of both parents are added up. To decrease the measurement error, parents' average income during the first three study years is used. Study field and university location specific information could be added to the data from two additional sources. KOTA database is used to obtain information on the median duration of completed degrees in the different fields. Information on local labor market conditions was available from the regional database of Statistics Finland (ALTIKA). Municipality-level unemployment rates for each year at each university location are obtained from this database and matched to the students at the corresponding universities.

The study uses the sum of months worked during the whole study time converted into years of work experience. The interpretation of the work experience variable is intuitive: it gives the expected pay of one additional year of work experience, all else equal. Unfortunately, the work months in the ES contain a considerable amount of measurement error. This is partly due to the way short employment spells are registered in the source register. Many students work part-time or have shorter than one-month's employment spells which are sometimes coded as a working month and sometimes not, depending on the applied insurance scheme and the type of employer. For example, if a student has worked for two days a month, this can be registered as a month of employment. This would lead to overestimation of the actual work months and thus, OLS estimate of the work experience would be biased towards zero.[1] To have some knowledge about the amount and impact of this measurement error, this study uses also LAASER survey data on graduates from six universities[2]. The LAASER data set was collected by AKAVA (the Confederation of Unions for Academic Professionals in Finland) in the fall of the year 2001. The survey questions were sent to 2,301 individuals who had graduated in 1997. The response rate varied between 40 and 50 percent at different universities and the final sample includes about 1,550 graduates. Due to the relatively low response rates and the exclusion of the majority of the Finnish universities, the survey is not likely to give a representative picture of all graduates. However, the data includes e.g. information on monthly wages in 2001, quality of the current job, employment situation after graduation, work history after graduation, and work months in the field of study during the enrollment, which are detailed information that cannot be received from the registers. In the study, similar models using the survey and the register-based data are estimated and the results are compared.

[1] See e.g. Green (2000) for a discussion on the direction of bias caused by badly measured regressors.

[2] The LAASER survey includes universities of Turku, Jyväskylä, Oulu and Lapland, Helsinki University of Technology, and Helsinki School of Economics.

Figure 1 shows the 1997 graduates' mean years of work experience by study field in the LAASER data and at the corresponding universities in the ES data. Graduates have accumulated about one year more work experience in the ES data. One explanation to this is that LAASER data includes only work experience that is related to the study field (except in engineering where all work experience is reported) and it is natural that some work experience is not related to the field of study. Another explanation to the difference is that graduates were asked to fill in the months of full-employment in the LAASER survey whereas the ES contains part-time jobs and short employment spells as well. The difference in accumulated work experience during the enrollment between the data sets decreases to about six months if part-time employment in LAASER data is taken into account. Students of different fields may work in different sectors and part-time employment or short employment spells are not necessarily registered uniformly between different sectors in the ES data. However, even if there is a clear difference in the level of acquired work experience, the ranking between the study fields seems to be the same in both data sets. Descriptive statistics of the data sets are presented in the Appendix in Table A1.

4. Student employment in Finland

Most of the students selected for the universities are admitted to courses leading to a Master's degree, which consists of 160-180 credits including a major and one or more minor subjects. Education is free, as there are no tuition fees. Most programs are designed so that it is possible to graduate in five years. However, students can, in principle, stay enrolled as long as they wish. The median time-to-degree in Master's programs is 6.5 years.

Students are entitled to financial aid. Before 1992, the student financial aid system was mainly based on subsidized student loans. In 1992, the system was profoundly reformed[3]. Government subsidies on loans were abolished, but the amount of direct aid, the study grant, was more than doubled. The maximum amount of study grant and housing supplement after the reform was about 400 euro per month and the maximum amount of student loan was nearly 220 euro per month. The maximum duration of student aid was reduced from seven years to 55 months, which was an effective reduction of about one year since the length of a study year is nine months (from September to May). In order to keep receiv-

[3] For a more detailed description of the student aid reform, see Häkkinen & Uusitalo (2003).

ing student aid, a student has to progress in studies and get 2.5 credits per aid month. However, the credit requirement is not really binding: fulfilling minimum requirements yields 137.5 credits during the maximum aid period, which is still 22.5 credits short of the graduation requirement. Similar credit requirement was in effect also before the 1992 reform. Removing the interest subsidy made the student loans unpopular. Before the reform, roughly half of the students took out a loan but after 1992 this fraction was less than a third. Rather than taking out the loan, most students have preferred to add to their income by working. There are income limits for student earnings to ensure that the aid is used to finance full-time studies. A student is allowed to earn 505 euro per aid month before the aid is cut. Parental income does not affect the amount of student aid at tertiary level.

It is possible to combine work and studies, since no strict limits on the duration of studies are imposed. Roughly 50 percent of the university students work, most of them part-time. Students' employment decisions are clearly affected by the availability of student jobs. Working is more common in the Helsinki capital area (including Espoo) where there are lots of student jobs available (Figure 2). According to a recent survey on the students at the University of Helsinki, 75 percent of students worked during the semester 2000-2001 (Härkönen 2001). In smaller towns, in Joensuu for example, student jobs are hard to find and jobs are more seldom related to the student's field of study. There is also considerable time-variation in working during studies (Figure 3). Both students' earnings and months of employment decreased substantially as the unemployment rate increased in the early 1990s.

Before discussing the effects of student work on labor market outcome after graduation, it is instructive to look at the determinants of the decision to work during the studies. To examine the students' employment decisions, I use the ES sample and select all university students who record themselves as "present" in a given year[4]. Student's months of employment can be written as

$$E_{iut} = \alpha_t + \beta X_{it} + \gamma U_{ut} + \varepsilon_{iut} , \qquad (1)$$

where E is the number of months worked; X is a vector of individual characteristics, e.g. age, gender, family background and field of study; and U is a vector of labor market char-

[4] Students receive discounts e.g. for public transport. As the registration costs are low, it is often beneficial to register as a student even if one has no plans to take part in any courses or examinations.

acteristics, e.g. the availability of student jobs at the university location. Index *i* refers to individual, *u* to university location and *t* to time.

Random effects panel regression estimates are presented in Table 1[5]. I find that older and female students without children work more during the studies. Women with children work less but having children increases work months for men. To capture the student employment opportunities I measure the local unemployment rate at each university location. High unemployment significantly decreases the student employment. Working also increases with study years. Students who have been enrolled for more than seven years work more than any other class. In the estimations also first year students (the base category) seem to work a lot, but this is mainly because the months of employment are recorded by calendar year and many first year students have been working before entering the university at the beginning of the academic year in September.

In the interest of saving space, the coefficients of the field and year dummies are not reported. However, it should be pointed out that differences across fields are large, even after accounting for the student composition. Working is most common in engineering, healthcare, business, and pharmacy. Students in medicine, dentistry, veterinary, and theology work the least. There is considerable time variation in student employment. During the severe recession at the beginning of the 1990s student employment decreased. After 1992 student employment has increased considerably even if the local unemployment rate is controlled for. In addition to the changes in the labor market, also the changes in the student aid reform may have affected the employment decisions (see Häkkinen & Uusitalo 2003). Especially the loosening of the income limits of the student financial aid and high interest rates of the student loans could have drawn more students to the labor market.

In column 2, information on parents' income and university location dummies are added to the model. Results suggest that students with parents whose income is in the lowest quartile[6] work less than other students. One explanation for this could be that students with poorer parents do not have the same contact network in the labor market as students with

[5] Fixed effects estimates are very similar to random effects estimates.

[6] The quartiles are calculated from the sample used in the estimation and refer to the lowest quartile among the parents of the university students, not to the lowest quartile in population. I experimented with different measures of parental income but these did not change the results much.

wealthier parents. This might also suggest that the need of extra income to cover the costs of living is not the only motivation for student employment, although the differences in the working behavior of students with different family background are not very large. University town dummies are not reported in the table, but it could be mentioned that students in Helsinki work more than students elsewhere, even when the unemployment rate and the study field are controlled for. Costs of living, especially housing, are more expensive in Helsinki than in other university locations, but the housing supplement and the study grant are the same regardless of the place of residence. Diversified economic structure and large labor market in Helsinki also provide more job opportunities for students. The estimates in column 2 are based on a smaller sample because the parental information was not available for all students.

5. Theory and econometric methods

The traditional models of human capital investment like Ben-Porath (1967) or Becker (1962) do not consider working during the enrollment as an investment in human capital. However, one can assume that students allocate their time between acquiring formal education at university and job skills at work. The same person-specific factors that influence the traditional school vs. work decision also affect the decision to combine studies and working, and the model including the in-school work experience is basically the same as the traditional Mincer (1974) earnings model. Light (2001) and Hotz et al. (2002) use the same kind of approach in their studies.

It is clearly not random who works and who does not work while studying at university. In addition to student's ability and preferences, local employment possibilities and labor market conditions during the studies define whether a student enters the labor market prior to graduation. Simply looking at returns to work experience without correcting for the selection would yield biased estimates. If the students who benefit more from the work experience or the students with higher unobserved ability work more during the enrollment, the selection would bias the OLS estimates upwards. On the other hand, the measurement error in the work months will bias the OLS estimates downwards and thus, the total bias is ambiguous. To diminish the selection bias and the measurement error bias in in-school work experience, instrumental variable technique is used.

An instrumental variable must satisfy two requirements: it must be correlated with the included endogenous variable(s) and it must be orthogonal to the error term. The study uses the local unemployment rate during the studies as an instrument for the acquired work experience. As the above results on student employment show, the unemployment rate at the university location during the studies has a strong negative effect on students' work months. Correlation with the endogenous regressor can be assessed by an examination of the significance of the excluded instrument in the first-stage IV regression. The F-test of significance of the instrument shows that the local unemployment rate during the studies is a relatively strong instrument in all estimated models. The orthogonality assumption is satisfied if the unemployment rate at the university location during the studies does not have a direct effect on employment status or annual earnings after graduation. The orthogonality assumption cannot be tested without having more instruments, but this seems to be a reasonable assumption if the unemployment rate after graduation is controlled for. Thus, the local unemployment rate during the studies can be used as an instrument provided that the current local unemployment rate is controlled for.

The IV-estimates are identified because there is considerable variation in local unemployment rates, both between the university locations and over time. Students who studied in the late 1980s had very good job opportunities during the enrollment compared to students enrolled in the mid 1990s. Taking the extreme as an example, in Helsinki the unemployment rate at the end of the 1980s was less in than 2 percent whereas the unemployment rate in Rovaniemi was about 8 percent. Due to the recession in the early 1990s, the unemployment rate had climbed up to 18 percent in Helsinki and up to 26 percent in Rovaniemi by the year 1995. Largest university towns have more than one university and provide education in many study fields. Therefore, models are identified even when dummy variables for study fields are included in the model. In principle, one could also add controls for universities or university towns in the IV models. Because the local unemployment rate during the studies is used as an instrument in the IV model, the identification would require that unemployment rates in different university towns change differently. In practice, however, even if the levels of unemployment are very different, the unemployment rates move into same direction in all university locations and the model is not identified if university or location dummies are included in the IV model. The local unemployment rate after graduation is the unemployment rate of the region where the graduate is living on the last day of the observation year. Many students move from smaller towns to the capital region after graduation. Only 33 % of the graduates studied in Helsinki but 42 % of them are living there after graduation. On the other hand, the flow of graduates goes to all directions; 18 % of students in Helsinki move to another part of the country after graduation.

Employment probability models for graduates are estimated one, two and three years after graduation. Besides the effect on wages, acquired in-school work experience may play an important role in getting the first job after graduation. Those with work experience may get more steady jobs or avoid searching for employment by staying with the same employer as prior to graduation. Merely looking at the earnings of the employed may not give the right picture of the effects if the in-school work experience has a large effect on employment probability after graduation. The probability to be employed is given by

$$P(employed = 1)_{it} = \Phi(\alpha_i + \beta_1 X_{it} + \beta_2 U_{ut} + \beta_3 D_i + \delta EXP_i), \qquad (2)$$

where Φ is the cumulative standard normal distribution, X is a vector of personal characteristics, U is the local unemployment rate, D is a set of dummy variables for the field of study, and EXP is accumulated work experience during the studies. Index i refers to the individual, t refers to time, and u refers to location. Because the probit model cannot take into account the endogeneity of the work experience acquisition, the employment probability is estimated with OLS and IV. Thus, the model is

$$Employed_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 U_{ut} + \beta_3 D_i + \delta EXP_i + \varepsilon_{itu} \qquad (3)$$

The accumulated work experience is endogenous and the instrument used in the IV models is the local unemployment rate during the studies. Linear probability models can be thought of as reasonable approximations because we are only interested in the net effect of a change in work experience on the probability of being employed.

The wage equation estimates are conditional on working, i.e. graduates who are unemployed or outside the labor force are excluded from the earnings equations. 65 % of the graduates work at least six months and 44 % of the graduates work 12 months during the year following the graduation. Two and three years from the graduation two thirds of the graduates are employed at least half a year and more than half of the graduates work full 12 months. The earnings model is a modified version of the traditional Mincer equation.

$$\ln W_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 S_{it} + \beta_3 U_{ut} + \beta_4 D_i + \beta_5 \ln M_{it} + \delta EXP_i + \varepsilon_{itu}\,, \qquad (4)$$

where W is annual wage earnings, X is a vector of individual characteristics, S is the years of schooling, U is local unemployment rate, D is a set of dummy variables for the field of study, M is the number of work months during the observation year, EXP is the accumulated work experience during the studies, and ε is the disturbance term. Since all individuals studied are university graduates with equal amount of schooling (Master's degree), the years of schooling variable can be dropped from the estimations. Also the work experience after graduation can be left out from the model because all the individuals are observed at the same time after the graduation and, hence, have the same amount of potential work experience. Because the data does not include monthly wages, the study uses the logarithm of annual earnings as the dependent variable and includes the logarithm of work months in the explanatory variables[7]. Monthly wages could be calculated from the data, but this would be a more restrictive approach[8].

The acquired work experience during the enrollment is endogenous and it is instrumented with all the variables in the equation (4) plus the unemployment rate at the university location during the studies. The in-school work experience variable used in estimations is the sum of months worked during the enrollment divided by 12, which gives the total work experience in years.

The effect of the accumulated work experience should diminish when graduates get more experience in the labor market. Therefore, the earnings equation is estimated separately one, two and three years following the graduation year. The month of graduation is added into the explanatory variables, because students who have graduated at the beginning of the year have had more time to look for a job and have potentially more post-graduate work experience one year after graduation than those who have graduated at the end of the year.

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[7] Thus, theoretically, the coefficient of logarithm of work months should be equal to one. However, monthly wages can be correlated with work months and also the measurement error affects the coefficient.

[8] However, using monthly wages as the dependent variable results in identical coefficient estimates and only slightly different standard errors.

6. Results

The main question of interest is how the work experience acquired during the studies affects employment and earnings after graduation. The study estimates employment probabilities and earnings equations at different points in time using different sample specifications and estimation techniques to check the robustness of the results.

The models for employment probability and earnings are similar and the same arguments for model specification and data sets apply to both estimations. The only difference is the dependent variable used. Therefore, the motivation for different model specifications and samples is discussed in the section concerning employment probabilities and not repeated in the section discussing the results from the earnings equations. In the interest of saving space, only the estimates of in-school work in different models are reported in the tables.

6.1 Employment probability

Since working is likely to affect the study intensity and thus timing of the graduation, the models are estimated both with and without controlling for the elapsed time-to-degree. The interpretation of the coefficient of the work experience is different in these two specifications. When the time-to-degree is controlled for, the coefficient of the acquired work experience is the return to working when the time spent at getting the degree is not changed because of working. This would be reasonable if a student only worked during the holidays. When the time-to-degree is not controlled for, the coefficient of the work experience can be interpreted as a joint effect of investing in job skills and prolonging the studies. For the employment probabilities these two specifications give very similar results, but as is seen later, the returns to working measured as earnings are much lower when the time-to-degree is not controlled for.

Table 2 presents the estimates of the effect of in-school work experience on employment one, two and three years after the graduation. OLS estimates show that acquired in-school work experience has a positive but decreasing effect on employment probability after graduation. The effect of in-school work experience diminishes when graduates get more post-graduate experience and more permanent jobs. The mean predicted employment probability is about 70 percent. Keeping everything else equal, one additional year of in-school work experience increases the probability to be employed one year after graduation by 5.5 percentage points. The effect is 4.1 percentage points two years and 3.8 percentage points three years after graduation. In the probit models, marginal increases in employment probabilities (calculated at means) are slightly higher than the OLS estimates, but qualitatively probit models are very similar to OLS models.

OLS and probit estimates might be biased because of the measurement error in the work months, but also because the students who work during the studies are not randomly selected. Instrumental variable technique is used in order to diminish the bias in the estimated effect. The instrument used in the IV models is the local unemployment rate during the enrollment. The point estimates of the work experience are smaller in the IV models, but the coefficient is not precisely estimated and it is not statistically significant. The Hausman test is performed to check the exogeneity of work experience acquired during the enrollment. Because the standard errors in the IV models are much larger than in the OLS models and the coefficient is not statistically significant, the Hausman test could not reject the null hypothesis that all covariates are exogenous and that OLS is a consistent estimator for the employment probability equation (p-values from 0.13 to 0.95).

Working might affect the timing of the graduation or lead to dropping out. Also, there are students who postpone their graduation until they get a job to avoid becoming unemployed, because employers may find unemployment spells to be a bad signal of the graduate's ability. Therefore, in Table 3, the employment probabilities are estimated including also individuals who have not completed their Master's degree. 66 percent of the students in the sample have graduated within ten years. Ten years from the first enrollment year, graduates have on average 2.2 years of in-school work experience and 2.8 years of work experience acquired after graduation. Non-graduates have acquired 5.6 years of work experience in ten years. Thus, graduates have on average seven months less work experience than those who have not graduated in ten years. Models with and without a dummy variable for graduates are estimated, but results from employment probability models are not sensitive to this change in the specification. In the OLS models, eight years from the first enrollment year, one additional year of work experience increases the employment probability by about 10 percentage points. However, the effect of work experience after graduation is nearly double, 19 percentage points (not reported in the table). Ten years after starting the university studies, the effect of undergraduate work experience is about 8 percentage points and the effect of work experience after graduation is about 12 percentage points. The point estimate of the undergraduate work experience drops into half when using the IV and the coefficient is not statistically significant. The results ten years from the first enrollment are based on only two starting cohorts (1987 and 1988). The marginal effect of in-school work experience in the probit model is 13 percentage points eight years and 8.5 percentage points ten years after entering the university. Compared to the results using only graduates, the effect of working while enrolled on employment is somewhat higher.

Because the work months in the ES data are measured with error, the employment probabilities after graduation are estimated using LAASER survey data. The results from this robustness check are presented in the lower part of Table 3. Here the in-school work experience includes all work experience for students in engineering and only study field related work experience for the other study fields. All individuals have graduated in 1997. The dependent variable is employment status after graduation where students are coded to be employed if they were working at the time of the graduation or they had a job waiting. In the probit model, at means, one year of work experience increases the probability to be employed by about eight percentage points, which is a little higher than the estimate received using the ES data. The OLS estimate for an additional year of in-school work experience is about five percentage points, which is similar to the OLS estimate from the ES sample. IV estimates using the LAASER data would be highly upward biased because the data do not have information on the graduates' area of residence after graduation and thus local unemployment rate or other characteristics of the local labor market after graduation cannot be controlled for. Therefore, IV models using LAASER data cannot be estimated.

Other results (not reported in the tables) are very similar in all model specifications. As expected, results show that high local unemployment rate decreases the employment probability. Older graduates have slightly higher employment probabilities and presence of children decreases the employment probability for women. There are large differences in employment probabilities between the fields of study. Graduates in the fields of engineering, medicine, law and business have the highest employment probabilities whereas humanities, theology, teacher education and psychology have the lowest. The time-to-degree does not have a significant effect on the employment probability in the models estimated using graduates.

6.2 Earnings equations

Figure 4 shows earnings profiles for graduates with more than 1.5 years of work experience during the enrollment and graduates with less experience. Graduates with more work experience earn about 9 percent more one year after the graduation. The difference in earnings seems to be quite persistent and it is still 8.8 percent five years from the graduation. However, looking at the raw data one cannot rule out that these observed differences in earnings simply reflect preexisting differences among individuals and a sorting process rather than real returns from work experience.

The dependent variable in the earnings equations is the logarithm of total annual earnings in each year and the estimations are restricted to individuals who are employed at least six months and earn at least 3,000 euro per year. Results from the earnings equations for graduates one, two and three years after graduation are presented in Table 4. Controlling for the time-to-degree, OLS estimates on earnings show that one additional year of in-school work experience gives 3.1 percent higher earnings one year after graduation. The in-school work has a positive effect of about same magnitude on earnings for all three years after graduation. The effect of working on earnings is lower, about two percent, when time-to-degree is not controlled for. Adding university dummies or dummies for the university location into OLS models do not change the coefficients of any variables and these dummies are mostly statistically insignificant.

As said earlier in the section discussing the results from employment probabilities, OLS models might be biased and therefore IV estimates are used to diminish the bias. IV estimates give considerably higher return to in-school work experience than OLS estimates when controlling for the time-to-degree. The IV estimates show that a student who works about three years during the enrollment gets 17.9 percent more earnings one year after graduation than a student who has two years of in-school work experience. There is a decreasing trend in the IV estimates, but IV estimates are still a lot higher than OLS estimates for all years. However, IV estimates are not statistically significant after the first year. The

Hausman test rejects the OLS for the first year after graduation, but in later years when the IV estimates are not statistically significant, the Hausman test cannot reject the OLS model.

When the time-to-degree is controlled for, the estimated effect is the return to in-school work comparing individuals who have studied as long time but differ in the amount of acquired work experience. Thus, working has a huge positive effect if the time-to-degree is not affected by working. However, given the duration of studies, individuals with work experience are probably more able than individuals with no work experience. Excluding the time-to-degree gives the return to working taking into account that working does not only increase skills but often also delays graduation. This specification is more intuitive, if one is interested in the distortion effect of working. If the time-to-degree variable is excluded from the IV model, the point estimates of in-school work experience become smaller, about three percent one year after graduation and two percent two years after graduation, which are fairly close to the OLS estimates without a control for the time-to-degree. None of the IV estimates are statistically significant when time-to-degree is not controlled for and the Hausman test cannot reject OLS model. The first-stage estimates of the IV earnings equations are presented in the Appendix in Table A2.

As in the employment probability section, some robustness checks using data for graduates and non-graduates and the LAASER survey data are performed. Table 5 presents the results from these robustness checks. Using data on graduates and dropouts and a dummy for graduates, OLS estimates show that work experience acquired while enrolled increases earnings by 4.4 percent eight years and by three percent ten years after starting the studies. Work experience acquired after graduation increases annual labor income by roughly seven percent. If an individual has graduated by the eight year, the earnings are 23 percent higher. After ten years the "bonus" for graduation is 12.5 percent. This might partly be explained by the larger number of hours graduates work. At least eight years after the first enrollment there are still active students among the non-graduates. Students who have not graduated in ten years have a very low probability to graduate, and most of these students are not actively studying. The estimates ten years from the first enrollment year are based on only two cohorts.

IV estimates give approximately 15 percent return to in-school work experience eight years from the first enrollment year. After ten years, the point estimate is about seven percent, but it is not statistically significant. Graduates get almost 43 percent higher earnings than non-graduates after eight years. The effect is not as large after ten years and the point estimate is not statistically significant. Dropping the dummy variable for graduates decreases the point estimates for in-school work experience in both OLS and IV models.

Lower part of the Table 5 shows the results of earnings equations from the LAASER survey data. The dependent variable is the logarithm of the monthly wage in 2001 (four years after graduation) and the instrument is the local unemployment rate during the average length of enrollment in the study field. Here, in contrast to the employment probability model, the place of residence at the observation time can be controlled. The OLS estimate is 2.5 percent, which is of same magnitude as the estimate received using the ES data for graduates. In the IV earnings equation, the return work experience is 17.6 percent four years after graduation. This is a considerably larger return than what was received using the ES sample. The LAASER results are not fully comparable with the ES sample results, because the work experience in the LAASER data includes only experience in the field of study and graduates from selected universities and fields of study.

Other results (not reported in the tables) are very similar in all model specifications. Results show that in the first year following the graduation women have about four percent lower earnings than men and the earnings of men grow faster than women's earnings. Three years later men earn roughly seven percent more than women with same characteristics. The presence of children decreases the earnings of women even more. Marital status does not have a significant effect on earnings. Graduates of medicine, business and engineering have the highest earnings. The difference in earnings between graduates of medicine and humanities is huge: 56-70 percent.

6.3 Robustness

Graduates with long times-to-degree are missing from the sample based on the ES because the first enrollment year was constrained to 1987. As an experiment, a sample of individuals who graduated between 1991 and 1996 (with no constraint on the starting year) was constructed from the ES research database and all models were re-estimated with this sample. The whole in-school work experience could not be calculated for this sample so the work experience of the last four study years is used as the measure of in-school work experience[9]. Work experience had a higher impact on the employment probability in this sample. In the employment probability model, the OLS point estimate for in-school work experience varied from 0.10 in the first year to 0.06 in the fifth year after graduation. The IV point estimates in the employment probability model varied from 0.12 to 0.08 and were statistically significant for the first two years after graduation. Furthermore, the effect on earnings is slightly higher in OLS models (from 3.8 % to 6.5 %) during the first five years after graduation if the sample of 1991-1996 graduates is used. IV estimates of the earnings equation resemble the previous results and they were not statistically significant.

Some other experiments, including redefining the in-school work experience as the work experience acquired during the first five years of study, dividing the work experience into two parts (up to three months and 4-12 months per year) to the catch the possible different effects for working during holidays and working throughout the year were performed as well. Models were also estimated separately for the largest fields of study. However, these experiments did not give results that differ much from the previous specifications.

7. Conclusion

Working during the university studies is an investment in job skills that might generate higher earnings or employment after graduation. On the other hand, working during the studies may also interfere with academic achievement and lead to longer times-to-degree. The essential question is whether the gains from employment are larger than the distortion effect working has on the achievement in university. This study examines the effect of in-school work on employment and earnings after graduation. OLS estimates show that work experience during the enrollment is associated with higher employment probability and higher annual earnings after graduation. However, the amount of work experience one achieves during the studies is not exogenous and adding a lot of controls for individual background might not solve the problem of the endogenously chosen amount of in-school work. The acquired work experience is also affected by the availability of student jobs. Instrumental variable technique, provided that the necessary conditions for the IV estimator are satisfied, can be used to correct for the endogeneity bias. Using the local unemployment

[9] This is of course highly endogenous because working affects the timing of the graduation and using the last four study years makes the endogeneity problem worse.

rate during the studies as an instrument and comparing graduates with equal times-to-degree, the study finds that one additional year spent working yields considerable increase in earnings one year after graduation, and the effect is positive and decreasing but statistically insignificant in the later years. However, it is likely that working delays graduation and if the time-to-degree is not controlled for, the effect of work experience on earnings is much lower and statistically insignificant for all years. There are no significant effects on the employment probability when instrumental variable technique is used.

Working is likely to affect the timing of the graduation and the dropping out behavior. Earnings estimates of graduates and dropouts eight and ten years after the first enrollment year suggest that work experience acquired during the enrollment is associated with higher earnings, but work experience after graduation and a completed degree give a higher return than in-school work experience.

The positive effects of student employment on earnings seem to be moderate and quite short lived if the selection in work experience acquisition is controlled for. If one wants to decrease the amount of work students choose, the amount of financial aid for students should be on the level that enables full-time studies, and both the financial aid system and the way studies are organized at universities should encourage pursuing full-time studies instead of combining studies with part-time work. The government is currently considering increasing the maximum amount of student loan, but it is unclear whether this would decrease student employment since the majority of students prefer working to taking out the loan. The Ministry of Education has suggested that the maximum enrollment time should be limited to the theoretical length of the program plus two years. Thus, in most cases the maximum enrollment time would be seven years. This could decrease the student employment and shorten the extremely long times-to-degree, but since the median student graduates in less than 6.5 years, this would have no effect on the employment decisions of the majority of the students.

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Figure 1. Years of work experience during the enrollment. Graduates of 1997 from selected universities.

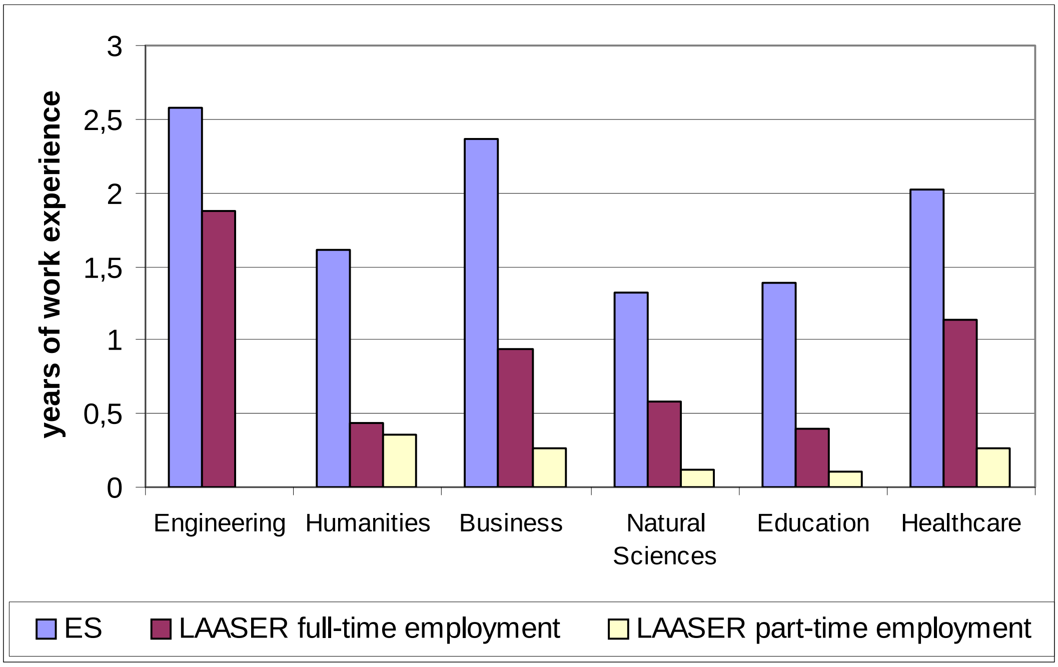

Figure includes only graduates of 1997 from universities of Turku, Lapland and Jyväskylä, Helsinki School of Economics, Helsinki University of Technology and graduates in the field of engineering at University of Oulu.

Figure 2. Mean months of employment and median annual earnings of students by university location.

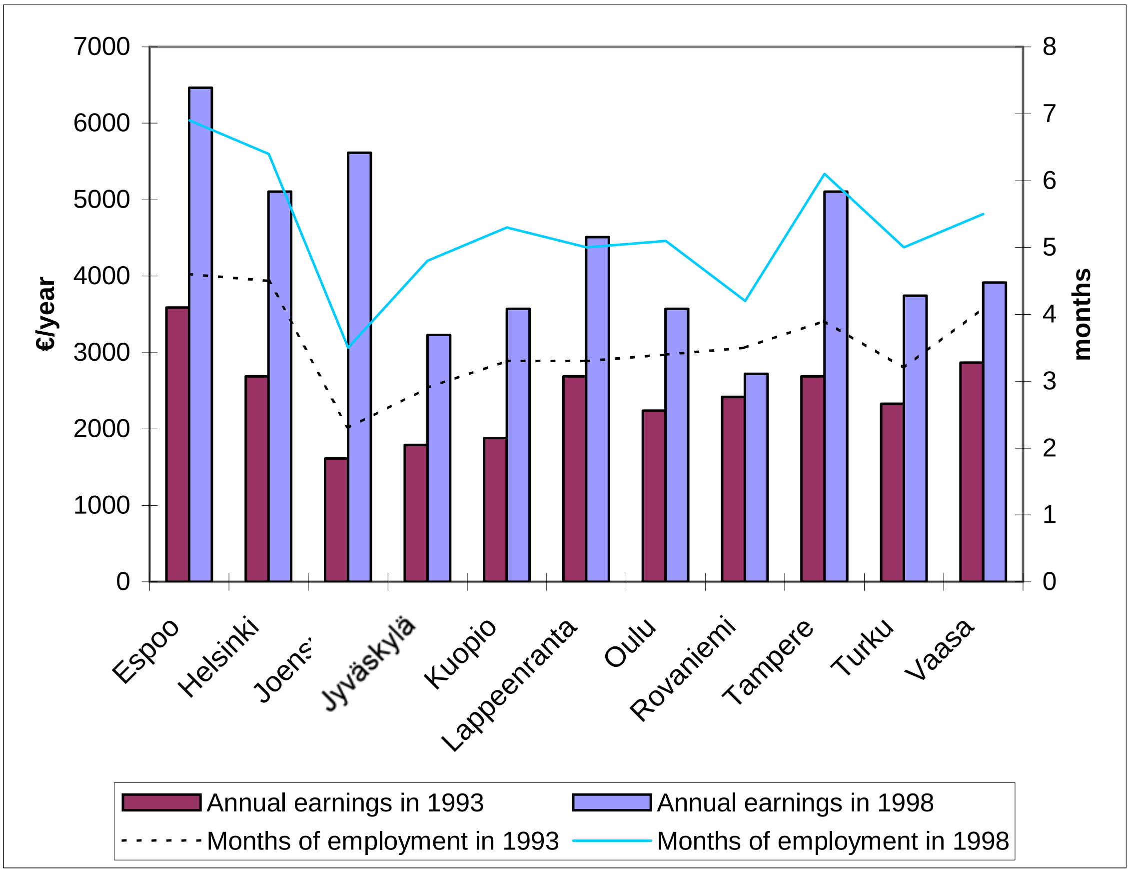

Figure 3. Unemployment rate, students' annual earnings and months of employment in 1987-1999.

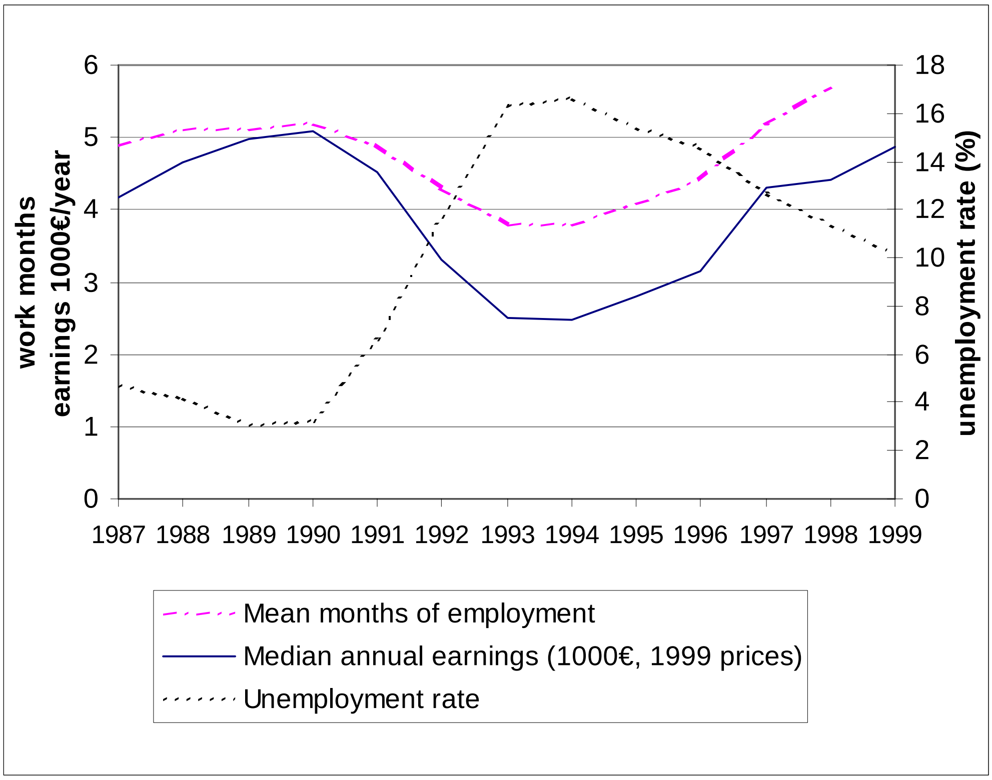

Figure 4. Annual earnings after graduation by in-school work experience.

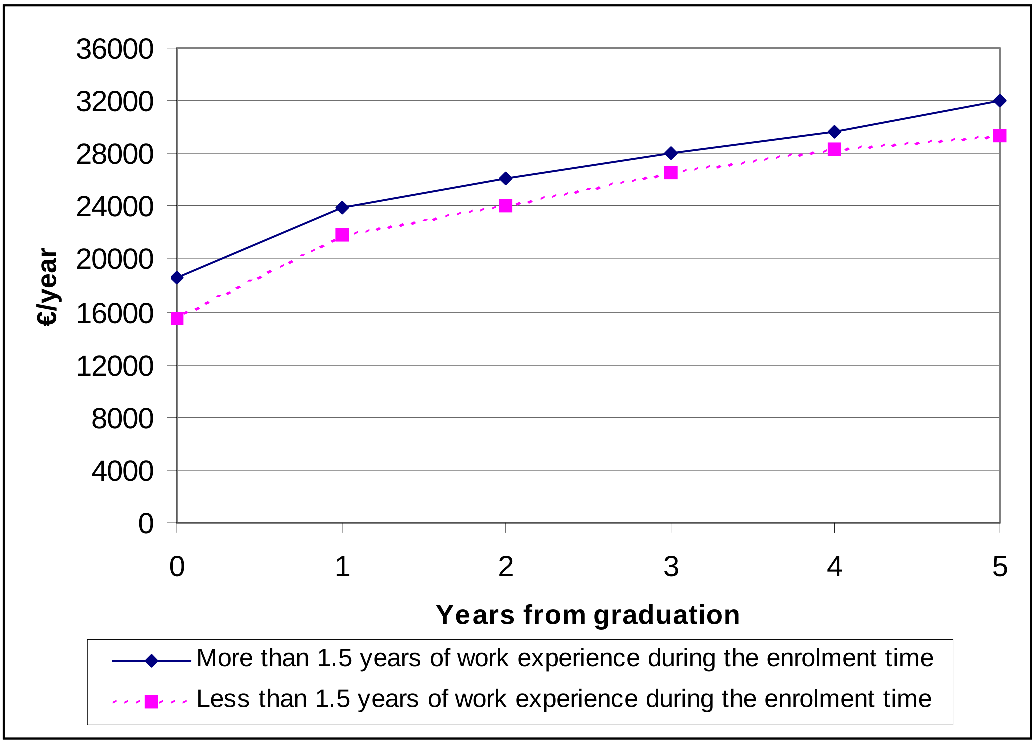

Table 1. Determinants of student employment. Random effects panel estimates.

Dependent variable: Months of employment	(1)	(2)
Local unemployment rate	-0.16	-0.23
	(21.67)**	(10.61)**
2nd study year (base group 1st study year)	-0.35	-0.36
	(7.66)**	(6.83)**
3rd study year	-0.38	-0.42
	(7.95)**	(7.02)**
4th study year	-0.44	-0.45
	(8.26)**	(6.28)**
5th study year	-0.34	-0.45
	(5.77)**	(5.39)**
6th study year	-0.15	-0.31
	(2.28)*	(3.15)**
7th study year	0.02	-0.23
	(0.20)	(2.03)*
> 7th study year	0.39	0.06
	(4.66)**	(0.44)
Age	0.90	1.02
	(30.52)**	(21.89)**
Age2	-0.01	-0.01
	(22.14)**	(15.24)**
In military service	-1.05	-0.88
	(5.95)**	(3.99)**
Female	0.23	0.26
	(4.27)**	(3.93)**
Female*children	-2.60	-2.73
	(23.35)**	(18.29)**
Children	0.37	0.30
	(4.27)**	(2.57)*
Parents' income below 25th percentile	-	-0.16
		(2.21)*
Number of observations	78,454	50,971
Number of students	17,547	9,344

Absolute value of z statistics in parentheses. * significant at 5%; ** significant at 1%. Both models include dummies for the field of study and year dummies. Model (2) also includes dummy variables for university towns.

Table 2. The effect of working during the enrollment on employment: summary of results from different model specifications.

	ES data, including only graduates	Coefficient of years of work while enrolled		
	Dependent variable: Employed at least 6 months	1 year after graduation	2 years after graduation	3 years after graduation
(1)	Control for the time-to-degree:			
	Probit	0.069	0.060	0.048
		(0.008)**	(0.009)**	(0.012)**
	OLS	0.055	0.041	0.038
		(0.006)**	(0.007)**	(0.009)**
	IV	0.034	-0.004	0.041
		(0.044)	(0.056)	(0.059)
	Hausman statistic	0.21	0.58	0.001
	(p-value)	(0.65)	(0.45)	(0.95)
(2)	No control for the time-to-degree:			
	Probit	0.063	0.056	0.047
		(0.008)**	(0.009)**	(0.011)**
	OLS	0.050	0.040	0.038
		(0.006)**	(0.006)**	(0.009)**
	IV	0.024	0.016	0.040
		(0.017)	(0.022)	(0.030)
	Hausman statistic	2.33	1.17	0.01
	(p-value)	(0.13)	(0.28)	(0.93)
	Sample size	2,986	2,301	1,617

Robust standard errors in parentheses. The other included variables are local unemployment rate, graduation month, age, female, female*children, a set of dummy variables for the field of study and graduation year. Probit models include also university dummies. The instrument in the IV models is the mean local unemployment rate during the enrollment. Robust standard errors are not used when calculating the Hausman statistic.

Table 3. The effect of working during the enrollment on employment. Robustness checks using different samples.

		Coefficient of years of work while enrolled	
	Dependent variable: Employed at least 6 months ES data, including all individuals	8 years from the start	10 years from the start
(1)	Control for graduates:		
	Probit	0.118	0.075
		(0.005)**	(0.006)**
	OLS	0.096	0.074
		(0.003)**	(0.004)**
	IV	0.035	0.047
		(0.041)	(0.034)
	Hausman statistic	2.31	0.57
	(p-value)	(0.13)	(0.45)
(2)	No control for graduates:		
	Probit	0.130	0.085
		(0.005)**	(0.005)**
	OLS	0.101	0.079
		(0.003)**	(0.003)**
	IV	0.051	0.047
		(0.034)	(0.034)
	Hausman statistic	2.14	0.85
	(p-value)	(0.14)	(0.36)
	Sample size	3,935	1,930

	Dependent variable: Employed after graduation LAASER data		
(3)	Probit	0.081	
		(0.013)**	
	OLS	0.049	
		(0.009)**	
	Sample size	1,549	

Robust standard errors in parentheses. The other included variables are local unemployment rate, graduation month, age, female, female*children, a set of dummy variables for the field of study, and the first enrollment year. Probit models include also university dummies. The instrument in the IV models is the mean local unemployment rate during the enrollment. In model (3) the LAASER survey data is used and the included covariates are female, age, university town and field of study dummies. Robust standard errors are not used when calculating the Hausman statistic.

Table 4. The effect of working during the enrollment on earnings: summary of results from different model specifications.

	ES data, including only graduates	Coefficient of years of work while enrolled		
	Dependent variable: annual earnings	1 year after graduation	2 years after graduation	3 years after graduation
(1)	Control for the time-to-degree:			
	OLS	0.031	0.022	0.030
		(0.007)**	(0.008)**	(0.010)**
	IV	0.179	0.103	0.06
		(0.067)**	(0.086)	(0.091)
	Hausman statistic	6.10	0.81	0.10
	(p-value)	(0.01)	(0.37)	(0.75)
(2)	No control for the time-to-degree:			
	OLS	0.024	0.019	0.022
		(0.006)**	(0.008)**	(0.009)**
	IV	0.029	0.018	-0.013
		(0.017)	(0.024)	(0.036)
	Hausman statistic	0.08	0.00	0.80
	(p-value)	(0.77)	(0.97)	(0.37)
	Sample size	1,937	1,527	1,077

Robust standard errors in parentheses. The included variables are ln(months of employment), local unemployment rate, graduation month, age, female, female*children, married, a set of dummy variables for the field of study and graduation year. The instrument in the IV models is the mean local unemployment rate during the enrollment. Robust standard errors are not used when calculating the Hausman statistic.

Table 5. The effect of working during the enrollment on earnings: robustness checks using different samples.

		Coefficient of years of work while enrolled	
	Dependent variable: annual earnings ES data, including all individuals	8 years from the start	10 years from the start
(1)	Control for graduates:		
	OLS	0.044	0.030
		(0.006)**	(0.007)**
	IV	0.147	0.071
		(0.063)*	(0.094)
	Hausman statistic	3.52	0.18
	(p-value)	(0.06)	(0.67)
(2)	No control for graduates:		
	OLS	0.032	0.023
		(0.006)**	(0.007)**
	IV	0.059	0.021
		(0.036)	(0.039)
	Hausman statistic	0.64	0.00
	(p-value)	(0.42)	(0.96)
	Sample size	2,459	1,341

	Dependent variable: monthly wages LAASER data	4 years after graduation	
(3)	OLS	0.025	
		(0.006)**	
	IV	0.176	
		(0.055)**	
	Hausman statistic	11.19	
	(p-value)	(0.00)	
	Sample size	1,196	

Robust standard errors in parentheses. In models (1) and (2) the included variables are ln(months of employment), local unemployment rate, graduation month, age, female, female*children, married, county dummies, a set of dummy variables for the field of study and the first enrollment year. The instrument in the IV models is the mean local unemployment rate during the enrollment. In LAASER data models the included covariates are female, age, married, children, female*children, local unemployment rate and a set of dummy variables for the field of study. Robust standard errors are not used when calculating the Hausman statistic.

Appendix

Table A1. Descriptive statistics of the data sets.

ES data	Graduation year		1 year after graduation		2 years after graduation		3 years after graduation	
	N	Mean	N	Mean	N	Mean	N	Mean
Age	3,745	27.02	2,984	27.94	2,299	28.83	1,614	29.19
Female	3,745	0.56	2,984	0.57	2,299	0.56	1,614	0.56
Female*Children	3,745	0.09	2,984	0.13	2,299	0.16	1,614	0.21
Children	3,745	0.15	2,984	0.21	2,299	0.29	1,614	0.37
Married	3,745	0.30	2,984	0.38	2,299	0.46	1,614	0.54
Months in employment	3,745	6.10	2,984	7.69	2,299	8.02	1,614	8.12
Annual earnings (Euro)	3,745	12,124	2,984	19,208	2,299	21,321	1,614	22,883
Local unemployment rate	3,745	17.24	2,984	16.89	2,299	16.44	1,614	16.01
Time-to-degree	3,745	5.90	2,984	5.75	2,299	5.57	1,614	5.33
Local unemployment rate during studies	3,745	13.33	2,984	12.25	2,299	11.04	1,614	9.53
Years of work while enrolled	3,745	1.88	2,984	1.84	2,299	1.80	1,614	1.75
Work experience after graduation (years)	3,745	0.50	2,984	1.13	2,299	1.75	1,614	2.37
Employed	3,745	0.52	2,984	0.65	2,299	0.66	1,614	0.67
Arts	3,745	0.02	2,984	0.02	2,299	0.02	1,614	0.02
Humanities and Theology	3,745	0.13	2,984	0.13	2,299	0.12	1,614	0.10
Education and psychology	3,745	0.17	2,984	0.17	2,299	0.20	1,614	0.21
Social sciences	3,745	0.09	2,984	0.09	2,299	0.09	1,614	0.09
Other healthcare	3,745	0.03	2,984	0.03	2,299	0.03	1,614	0.03
Law	3,745	0.04	2,984	0.04	2,299	0.04	1,614	0.05
Business	3,745	0.13	2,984	0.14	2,299	0.14	1,614	0.15
Natural sciences	3,745	0.12	2,984	0.12	2,299	0.11	1,614	0.11
Agriculture and forestry	3,745	0.03	2,984	0.03	2,299	0.02	1,614	0.02
Engineering	3,745	0.18	2,984	0.17	2,299	0.17	1,614	0.16
Medicine	3,745	0.06	2,984	0.06	2,299	0.06	1,614	0.06

LAASER data		
	N	Mean
Age (2001)	1,547	32.50
Female	1,547	0.60
Female*Children (2001)	1,276	0.18
Children (2001)	1,276	0.35
Married (2001)	1,275	0.75
Monthly wage in 2001 (Euro)	1,245	2,741
Local unemployment rate (2001)	1,231	8.47
Years of work while enrolled	1,547	0.97
Humanities	1,547	0.14
Education	1,547	0.19
Healthcare	1,547	0.07
Engineering	1,547	0.25
Business	1,547	0.24
Natural sciences	1,547	0.11

Table A2. First-stage estimates of earnings equations.

Dependent variable Years of work while enrolled	(1) 1 year after graduation	(2) 2 years after graduation	(3) 3 years after graduation	(4) 1 year after graduation	(5) 2 years after graduation	(6) 3 years after graduation
Local unemployment rate during studies	-0.053	-0.043	-0.053	-0.138	-0.123	-0.114
	(4.31)**	(3.08)**	(3.34)**	(13.91)**	(10.45)**	(7.88)**
Local unemployment rate	-0.022	-0.032	-0.019	-0.001	-0.013	-0.004
	(2.44)*	(3.29)**	(1.86)	(0.15)	(1.31)	(0.34)
Time-to-degree	0.330	0.346	0.330	-	-	-
	(10.95)**	(9.71)**	(7.92)**			
Ln months of employment	0.727	0.678	0.258	0.631	0.615	0.182
	(4.38)**	(3.40)**	(1.13)	(3.69)**	(3.00)**	(0.77)
Graduation month	-0.026	-0.035	-0.051	-0.014	-0.023	-0.039
	(3.00)**	(3.63)**	(4.89)**	(1.60)	(2.28)*	(3.66)**
Age	0.106	0.099	0.101	0.112	0.099	0.101
	(11.54)**	(9.93)**	(8.74)**	(11.88)**	(9.70)**	(8.51)**
Female	0.042	0.052	0.050	0.047	0.031	0.027
	(0.61)	(0.66)	(0.55)	(0.67)	(0.38)	(0.29)
Female*children	-0.364	-0.260	-0.222	-0.417	-0.254	-0.255
	(2.33)*	(1.67)	(1.43)	(2.59)**	(1.58)	(1.60)
Children	0.185	0.177	0.185	0.234	0.180	0.214
	(1.61)	(1.59)	(1.60)	(1.97)*	(1.56)	(1.80)
Married	0.128	0.168	0.089	0.094	0.135	0.050
	(1.86)	(2.23)*	(1.06)	(1.33)	(1.75)	(0.58)
Engineering	0.109	0.334	0.205	0.042	0.225	0.138
	(0.91)	(2.46)*	(1.29)	(0.34)	(1.62)	(0.85)
Arts	1.246	1.237	1.194	0.956	0.907	0.996
	(4.87)**	(4.51)**	(4.03)**	(3.64)**	(3.23)**	(3.28)**
Education and psychology	0.289	0.321	0.226	0.200	0.176	0.056
	(2.09)*	(2.08)*	(1.30)	(1.41)	(1.11)	(0.31)
Social sciences	0.161	0.387	0.272	0.072	0.298	0.147
	(1.18)	(2.55)*	(1.58)	(0.51)	(1.91)	(0.83)
Other healthcare	0.008	0.037	-0.240	-0.172	-0.142	-0.396
	(0.04)	(0.18)	(1.03)	(0.98)	(0.68)	(1.66)
Law	0.222	0.331	0.130	0.064	0.124	-0.056
	(1.37)	(1.79)	(0.65)	(0.39)	(0.65)	(0.28)
Business	0.220	0.266	0.142	0.005	0.012	-0.083
	(1.77)	(1.91)	(0.89)	(0.04)	(0.08)	(0.52)
Natural sciences	0.078	0.255	0.330	0.038	0.177	0.287
	(0.60)	(1.71)	(1.89)	(0.29)	(1.15)	(1.60)
Agriculture and forestry	0.192	0.347	0.001	0.024	0.151	-0.201
	(0.95)	(1.54)	(0.00)	(0.11)	(0.65)	(0.72)
Medicine	-0.761	-0.488	-0.588	-0.792	-0.508	-0.571
	(5.15)**	(2.91)**	(3.23)**	(5.20)**	(2.94)**	(3.05)**

Table continues on the next page.

Table continues from the previous page.

	(1)	(2)	(3)	(4)	(5)	(6)
Graduate year 91	0.797	0.712	0.717	0.935	0.878	1.094
	(1.39)	(1.43)	(1.54)	(1.58)	(1.71)	(2.29)*
Graduate year 92	0.756	0.431	0.524	1.183	1.035	1.245
	(1.38)	(0.91)	(1.19)	(2.09)*	(2.15)*	(2.80)**
Graduate year 93	0.928	0.582	0.559	1.752	1.531	1.584
	(1.71)	(1.24)	(1.25)	(3.16)**	(3.23)**	(3.61)**
Graduate year 94	0.821	0.543	0.604	1.991	1.825	1.953
	(1.51)	(1.14)	(1.29)	(3.61)**	(3.86)**	(4.37)**
Graduate year 95	0.815	0.365	0.489	2.331	2.039	2.146
	(1.47)	(0.74)	(0.99)	(4.22)**	(4.26)**	(4.68)**
Graduate year 96	0.849	0.452	-	2.684	2.429	-
	(1.51)	(0.88)		(4.85)**	(4.99)**	
Graduate year 97	0.820		-	2.932	-	-
	(1.43)			(5.26)**		
Constant	-4.388	-4.059	-3.134	-3.208	-2.809	-2.071
	(5.90)**	(5.26)**	(3.80)**	(4.23)**	(3.59)**	(2.48)*
Observations	1937	1527	1077	1937	1527	1077
R-squared	0.27	0.24	0.24	0.23	0.19	0.19
Summary statistic from the first stage estimation:						
Partial R-squared of excluded instruments	0.0096	0.0063	0.0105	0.0920	0.0678	0.0557
Test of excluded instruments	18.55	9.51	11.15	193.57	109.25	62.02
(p-value)	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)

Absolute value of t statistics in parentheses. * significant at 5%; ** significant at 1%

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