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Abstract
The ranking of colleges varies both across methods and model specifications. Still, earnings equations tend to be consistent with regard to which colleges that on average are found in the top and bottom half of the earnings distribution. Moreover, there are no systematic differences in the ranking of colleges dependent on the age of the college, i.e. old versus new colleges. Although ranking by earnings equations provide some information about the relation to earnings, endogeneity issues preclude any causal interpretation of the rankings presented here.
Keywords: *University education, College choice, Ranking*
JEL-codes: *I21, J16, J24, J31, J44*

Sammanfattning
I den här rapporten undersöker jag hur stabil rangordningen av svenska universitet och högskolor är med avseende på vilka framtida inkomster examinerade studenter får. I studien testas en rad metodval för att göra sådana rangordningar. Resultaten visar att rangordningen varierar en del mellan olika metoder och modellspecifikationer. Trots det är det tydligt att ungefär samma lärosäten hamnar i den övre respektive nedre delen av rangordningen oberoende av metodval. Studien tyder vidare på att etableringsåret för högskolan inte spelar någon roll för var i rangordningen lärosätet hamnar. Däremot varierar rangordningen mellan olika utbildningsinriktningar.

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1 Introduction

Results from previous studies indicate that the college attended during education is correlated with post college earnings. There are two main causal explanations in the literature to why college attended might affect future earnings. First, college may capture the quality of education which should affect individual productivity and hence individual future earnings. Second, information is costly and individual productivity might be imperfectly observed, hence employers use the college attended as a sorting device, i.e. as a signal of individual productivity. A general problem with analyzing the relation between college attended and post college earnings is that students do not select college at random.

The majority of previous studies on earnings differentials across students graduating form different colleges deal with US data.[1] More recently, as a result of the rapid expansion of the higher educational system in Sweden, a number of studies on Swedish data have emerged.[2] During the 1990s the number of new students increased with 50 percent, and the number of individuals with a university degree increased with 25 percent.[3] Moreover, the number of colleges providing higher education within most academic fields has increased from five universities in 1965 to about 25 universities and university colleges today.

Previous studies use different approaches to adjust for students' non-random selection of colleges. Using US data, e.g. Behrman et al. (1996) use data on female twins, Brewer et al. (1999) model the students' choice of college and add a selection-correction term to the wage equation, Monks (2000) control for family income and results on the Armed Forces Qualification Test (AFQT), Dale-Berg and Krueger (2002) run earnings regressions on students who were accepted and rejected by a comparable set of colleges and Black and Smith (2004) use matching methods. These studies generally find that attending a high-quality college rather than a low-quality college is

[1] See e.g. Monks (2000), Brewer et al. (1999), Behrman et al. (1996), Datcher Loury and Garman (1995), Berg Dale and Krueger (2002), Black et al. (2005), Black and Smith (2004, 2006).
[2] Gustafsson (1996), Wadensjö (1991), Lindahl and Regnér (2005), Gartell and Regnér (2002, 2005, 2008), Eliasson (2006), Lundin (2006), SOU 2008:69, Holmund and Regnér (2009), Holmlund (2009).
[3] National Agency for Higher Education (2001)

associated with 5–15 percent higher post college earnings.[4] The effect of adjusting for students' non-random selection of colleges varies between studies; the estimated college effects are either not affected, adjusted downward or adjusted upward.

Past studies on Swedish data use different approaches with respect to models, methods and aggregation of colleges. Some studies estimate earnings differentials across colleges on a disaggregate level, i.e. for each individual college; Wadensjö (1991) and Gustafsson (1996) do not attempt to adjust for students' non-random selection of colleges, Gartell and Regnér (2002, 2005, 2008) and SOU 2008:69 include parental education and grade point average from high school in the regressions. These studies generally find that the college attended is often correlated with post-college earnings differentials in the range –20 to +20 percent.

Some studies aggregate colleges together, focusing on the dimension of new versus old colleges; Eliasson (2006) includes a rich set of family background variables and, as Lundin (2006)[5], uses matching methods. Lindahl and Regnèr (2005) apply sibling fixed effects, i.e. controlling for all time-constant factors that siblings have in common. Lindahl and Regnér present college estimates both on an aggregate and on a disaggregate level. These studies report significant and positive earnings coefficients of 4 to 6 percent of graduating from an old college compare to a new. The exception is Eliasson (2006), which finds no earnings differentials across college categories. Previous studies on Swedish data also differ with respect to samples included in the analyses, specifications of the earnings equations (particularly regional control variables), the follow-up period and somewhat also with respect to the outcome variable used. These differences between previous studies make it difficult to ascertain whether rankings based on earnings equations are reliable. Thus it is of interest to analyze why the results vary.

[4] Chevalier and Conlon (2003) and Hussain et al. (2009) use non-US data. They apply propensity score matching on data for the UK and find that attending a more prestigious university is associated with a significantly higher wage.

[5] de Luna and Lundin (2009) use the results presented in Lundin (2006) to study the sensitivity to the unconfoundedness assumption, i.e. that there are no unobserved covariates affecting both the treatment assignment and the outcome. They introduce a parameter with the purpose to induce dependence between the potential outcomes and the assignment mechanism. The results in Lundin (2006) are very sensitive to the unconfoundedness assumption. However, the observed sensitivity does not seem to invalidate the conclusion that there is evidence for a college choice effect on income.

This study investigates *i)* how stable the ranking of colleges is to different methods and model specifications using the same data and setup throughout, and *ii)* how sensitive the results are to the aggregation of colleges into new and old. The ranking is based on relative earnings estimates dependent of college attended. College rankings based on earnings equations could provide information both to policymakers and students. It is therefore important to investigate the stability of the information provided by such rankings. Further, to assess sensitivity this study also examines whether the earnings restriction invoked in previous studies affect the results. Unemployment at graduation is used as an alternative outcome measure. This outcome measure is not affected by the earnings restrictions and less affected by post-graduation experience.

The link between college attended and following labor market outcomes may be explained by several factors, e.g. selection of students, quality of education, signal effects etc. This study does not seek to identify which factor that explains the results. Instead it aims at examining the stability of the results to alternative methods and model specifications. This means that the estimated ranking of colleges in this study should not be interpreted as a causal relationship between college choice and earnings.

Rich administrative data have been provided by the Institute for Labour Market Policy Evaluation (IFAU), containing detailed information on individuals, their education and background. The population studied consists of all Swedish-born individuals that graduated from a Swedish college during 1991–1999. The sample is chosen in order to be able to follow the individuals for at least five years after graduation. In total, the analysis includes more than 200 000 individuals.

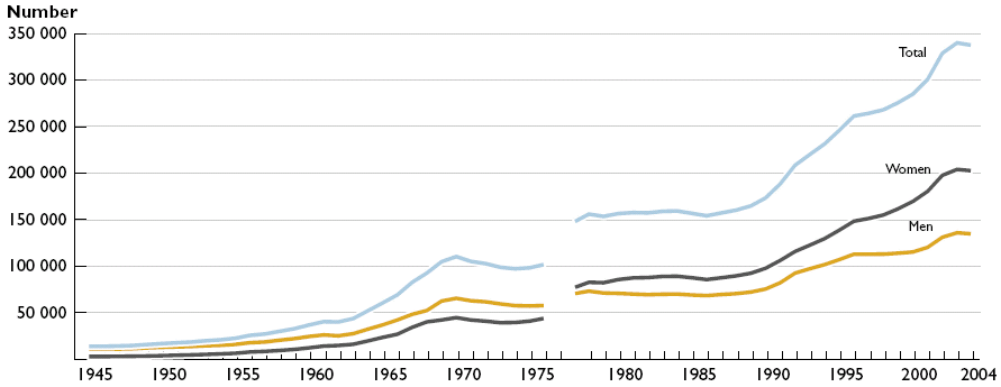
The results show that the ranking of colleges is clearly not identical across methods and model specifications. Still, earnings equations are consistent with regard to which colleges that in general are found in the upper and lower part of the earnings distribution. Moreover, there are no systematic differences in the ranking of colleges related to the age of the college. However, the ranking of colleges depends on fields of study. In all, rankings provide rather uncertain information about students' future labor market prospects. Even so, the results suggest that there are systematic differences in outcomes across colleges although not related to the distinction between new and old colleges.

The paper is structured as follows. The next section describes the Swedish institutional background. Section 3 provides a description of the data and sampling restrictions. In section 4, the strategy of the study is discussed while section 5 presents the results of the analysis. Finally, concluding remarks are offered in section 6.

2 Institutional background[6]

In 1965, there were five universities[7] in Sweden providing higher education within most academic fields. In the 1960s, there was a rapid increase in the number of students at the universities, and to meet the demand the government decided, among other reforms, to establish new colleges. In 1977, 12 new colleges were established, and three new colleges were established in the 1980s. Three more were added in the 1990s.

Figure 1. Number of students in undergraduate education autumn terms 1945-2004



Source: National Agency for Higher Education (2005a)

The new colleges were located to parts of the country with limited traditions of higher education. This decision was based on results that showed that the geographical distance to a college had a negative effect on the probability to enrol in college education especially for students with parents who were not college educated.[8] Yet another argument was that a college may have a positive impact on regional employment and

[6] This section is based on Gartell and Regnér (2008).
[7] University and college are terms used interchangeably throughout this paper.
[8] Kjellström and Regnér (1999) analyze enrolment patterns among students in the 1980s and find that the geographical distance affects the likelihood of enrolling, even when controlling for ability and parental background.

economic growth. This role of colleges was reinforced during the deep economic recession in the 1990s.

The system of higher education is financed and regulated by the Swedish Parliament and the Government.[9] Since 1977, a single administrative authority on the national level handles the admissions to all colleges.[10] The number of applicants to some fields of study is often higher than the number of educational slots, which means that applicants have to be ranked. Generally, grades from upper secondary schooling determine the admission.[11] Moreover, the number of applicants to certain fields can vary significantly between colleges. That is, a person with low grades can enrol in the same program as a top student but at a different college.

There are no tuition fees at Swedish universities, and the government offers universal financial support for all students. This support is twofold: grants and loans which, combined, constitute a sum of SEK 7 820 per month in 2009 (about EUR 782, 10 SEK/EURO). Parents' income or wealth do not affect the amounts that students receive.

3 Data

The data provided by IFAU combines various administrative registers from Statistics Sweden and the Public Employment office. The data is, as in previous studies, cross-sectional data of individual observations. The main original data sources are the college examination register which contains information about field and level of education, the high school examination register which contains information about e.g. average grades from upper secondary education, a longitudinal income register (LOUISE) that holds information on demographic and socioeconomic factors, the employment register (RAMS) that contains information about earnings and an unemployment register (HÄNDEL) which includes all unemployed individuals registered at the public employment office.

[9] See National Agency for Higher Education (2004, 2006, 2007) for details on higher education in Sweden.
[10] Initially, they handled applications to programs and all courses. Later they handle admissions mainly to programs, but still at most colleges, but since 2007 they again handle applications to programs and most courses.
[11] There is also an aptitude test, and previous work experience may be taken into account.

The data cover the whole population aged 16–65 in Sweden, but the sample used in this study consists of Swedish born individuals who graduated from a Swedish college during 1991–1999. The reason for this selection is that previous studies used similar samples. The colleges included are colleges that provide education within most academic fields. This excludes some specialized colleges, e.g. some business schools, hospitals and agricultural schools. However, a few colleges specialized in technology education are included. The reasons are that these colleges attract many students and are frequently included in previous studies. In total, the data in this study cover 25 colleges.

The main reason for using only graduates is that the time for finishing studies is not registered for non-graduates. Students may be divided into two groups; *program students* who enter a program usually lasting for three years or more, and *course students* who register at separate courses that typically last for one semester. However, separate courses may later be combined to correspond to a program. In total, out of all individuals with a university education lasting for three years or more, about 80 percent graduate.[12] However, the graduation frequency differs between colleges. Out of all individuals starting a college education at Chalmers University of Technology about 60 percent graduate, but only about 35 percent of the starters at Stockholm University graduate. For the great majority of colleges the graduation frequency varies between 40–50 percent. Further, almost one out of ten students graduate from a different college than the one where they first enrolled. The share of switchers does not vary a great deal across colleges though.[13]

Restricting the analyses to graduates may, due to selection, affect the ranking of colleges. But this selection is not a problem when comparing relative estimates across methods and model specifications.

[12] See National Agency for Higher Education (2005b)

[13] Holmlund and Regnér (2009) show that students who switch universities receive significantly lower annual earnings than students who do not change universities. This concerns students who change to universities of higher, observed quality and students who change to universities of lower observed quality. To transfer from a "high quality" college to a "lower quality" college does not have as negative effect on future earnings as transfers in other directions. However, the estimated earnings gap between transfer and non-transfer students narrows rapidly over time.

The outcome variables are either: *i)* annual earnings five years after graduation in the period 1996–2004, or *ii)* unemployment at graduation, i.e. whether an individual is registered at the public employment office within a year from graduation or not.[14]

Using annual earnings five years after graduation mean that the analyses focus on fairly recent college graduates. Even so, the follow-up period is still long enough for individuals to be established on the labor market and for many college graduates to start a career. Using unemployment at graduation as the outcome variable, all registrations at the public employment office are considered, regardless of type or duration. The three main categories that individuals are registered in are i) full-time unemployed ii) part-time unemployed or iii) job-changer. Individuals registered as job-changers are not unemployed at graduation but are however searching for a new employment, indicating that their current position is not satisfying with regard to their degree.[15] Therefore I include these individuals in the unemployed category.

The control variables are, also in line with previous studies, age, sex, county of birth, local unemployment rates, field and level of education, year and semester of graduation, the grade point average and the program studied in high school, parental background; educational level, age, country of birth, earnings and capital incomes.[16]

Grades from high school are only available for individuals who graduated from high school in 1985 or later. Consequently, grades are not available for all individuals. Grading, during the period covered in this study, consisted of a scale from 1–5; 1 being the lowest grade and 5 the highest.

If an individual has several graduation years, the latest is used. If there are several degrees the same year but at different levels, the highest-level degree is used. If there are several degrees the same year at the same level but within different fields, one is randomly chosen (about 0.005 percent of the population). Students graduating within

[14] Registration at the public employment office is not mandatory, but in order to participate in labor market programs it is required. Former students are entitled to benefits after being registered as unemployed for 90 days (See IAF, the Swedish insurance board, Fakta-PM 3:2005). About 90 % of individuals reporting unemployment were registered at a public employment office (see Statistics Sweden 1993).

[15] Gartell (2008) considers different types of unemployment and different unemployment durations estimating long-term effects of unemployment at graduation. Full-time unemployment is associated with larger future earnings losses compared to part-time unemployment. Being registered as a job-changer at graduation did not have any significant effects on future earnings. Further, the longer the duration of unemployment the larger are individual future earnings losses. See Gartell (2008) for a detailed description of types of unemployment in the different categories.

[16] See appendix *Table A 1* for details.

agriculture are excluded (about 3600 individuals). The reason is that individuals with a degree within agriculture often are self-employed and therefore registered labor earnings for this group are quite uncertain.

The total number of graduates 1991–1999 were 238 748. After data processing the population used in the analysis consists of 206 011 individuals. In total, about 14 percent of the sample was dropped. The main reason for dropped observations was that these individuals were not found in the population register either by the time of graduation or five years from graduation.

4 Strategy of the study

This paper focuses on the ranking of colleges with respect to labor market outcomes, where ranking is measured as relative earnings estimates and unemployment risks between students who graduated at different colleges. The estimated college coefficients are used to rank colleges, e.g. the college associated with the most positive coefficient in terms of earnings rank as number one and vice versa.

I use the Spearman rank correlation to examine the stability of college ranking. If the Spearman rank correlation is statistically significant the ranking of colleges are correlated across models and methods. But rank correlation coefficients provide only limited information about the stability of ranking. Therefore, as a complement, I conduct additional analyses of the top and bottom five colleges. Stability is therefore defined using two criteria: *i)* the Spearman rank correlation is significant and *ii)* the top and bottom five colleges are found in the upper and lower half of the earnings distribution across models and methods.

The ranking does not provide any information about the size of the estimated earnings differentials across colleges, or about significant levels. To investigate whether the earnings variability across colleges becomes larger or smaller when using different methods and model specification I use the weighted standard deviation (WSD) of college differentials. This measure provides an intuitive measure of the overall variability of the estimated college coefficients, and facilitates the analysis by providing a summary measure of the variation of the 25 coefficients of interest. If the estimated

college coefficients are a result of endogenous college choice, the earnings variability is expected to fall when (good) proxies for college choice are included in the analyses.

The estimated coefficients are the proportionate differences in earnings between students from a given college and the average student across all colleges. Checking the variability of each college coefficient separately in all combinations with different reference colleges would result in 625 (25*25) estimates for each specification and would just be confusing. The estimated WSD is based on the deviation of the estimated college differential from a weighted mean, i.e.

$$b_k^* = b_k - \sum_{k=1}^{k} \pi_k b_k , \tag{1}$$

where π_k is the share of college k (in number of graduates). *WSD* is then given by

$$WSD = \sqrt{\sum_{k=1}^{k} \pi_k (b_k^*)^2} . \tag{2}$$

However, the *WSD* statistic is upward biased since it ignores the least-squares sampling error arising from the fact that the reference b_k is itself an estimate.[17] Therefore, this paper calculates the unbiased estimator *WASD* (weighted adjusted standard deviation) using the method developed by Haisken-DeNew and Schmidt (1997).[18]

The following earnings equation is estimated

$$\ln Earnings_{i,\tau+5} = \beta_1 C_i + \beta_2 X_i + \tau_i + \varepsilon_i , \tag{3}$$

where $\ln Earnings_{i,\tau+5}$ is the logarithm of annual earnings for individual i at time $\tau+5$, C_i is a vector of colleges and X_i is a matrix of control variables, β_1 and β_2 are the

[17] Krueger and Summers (1988).
[18] See Haisken-DeNew and Smith (1997) for details. They show that WSD substantially overstate the standard errors of the estimated differentials.

corresponding vectors of coefficients, τ_i is a common time specific effect for individuals graduating the same year and semester and ε_i is the error term. Estimated college coefficients may only be interpreted as causal if all factors (observable and unobservable) that influence both the college attended and future labor market outcomes are controlled for. Most previous studies estimate separate earnings equations for men and women since the estimates differ substantially by gender. Therefore I also report separate estimates for the groups.[19]

The risk of unemployment upon graduation is estimated using a probit model

$$Unemployment_i = \beta_1 C_i + \beta_2 X_i + \tau_i + \varepsilon_i, \quad (4)$$

where $Unemployment_i$ is a dummy variable indicating whether an individual was registered at the public employment office within a year from graduation.

I examine the methods and specifications used in three different Swedish studies: *i)* a benchmark model is estimated, including a basic set of control variables as in Gartell and Regnér (2002, 2005, 2008) and SOU 2008:68; age, county of birth, graduation year and semester, field and level of education and parental level of education *ii)* in line with Eliasson (2006) an additional set of control variables is included for the sub-sample of individuals where the grade point average from high school is available, also the program studied in high school and parental information such as age, country of birth, earnings and capital incomes is included *iii)* a siblings fixed effect model, as in Lindahl and Regnér (2005), is estimated.[20] Sibling fixed effects control for all time constant factors that siblings have in common. Even so, it does not guarantee that all individual heterogeneity is properly controlled for.[21]

[19] See e.g. Gartell and Regnér (2005), Lindahl and Regnér (2005), Eliasson (2006).
[20] Eliasson (2006) and Lundin (2006) apply propensity score matching to handle students' non-random selection of colleges, investigating earnings differentials across new and old colleges. The results are stable with regard to using OLS or propensity score matching. Propensity score matching cannot be used in this study since, due to the limited sample, it restricts the analysis to groups of colleges and thus cannot provide a ranking and consequently the stability of the ranking is a void issue.
[21] See Griliches (1979) and Solon (1999).

I impose the earnings restriction used in previous studies, that all individual earn more than 100 000 SEK per year and show that the results in this study are not sensitive to the choice of earnings restrictions.[22]

How and if to control for local labor market conditions is an issue frequently discussed in previous studies. On one hand, there are earnings differences due to regional labor market conditions and those differences should be controlled for. On the other hand, choice of local labor market may be an outcome of college choice and should therefore not be controlled for. Some studies use county of work/residence *following* graduation to control for local labor market conditions. County of work/residence is highly correlated with college choice and eliminates much of the estimated earnings differentials across colleges.[23]

I use county categories of birth to control for local labor market conditions.[24] Counties are grouped together in three categories; Stockholm, other big cities (Malmö and Gothenburg), and other regions. This provides a compromise that control for clearly different regional labor market conditionss but avoids to condition on too specific outcomes. To assess the sensitivity of this I also estimate models that control for regional unemployment rates at the time of observed earnings.[25] Regional unemployment rates provide some information about local labor market conditions following graduation, but are not as highly correlated with college choice as county of work/residence.

College coefficients are estimated for each individual college, but for comparison to previous studies colleges are also aggregated into two groups of new and old colleges. The main motive for estimating college effects for each separate college is that the stability of college ranking is in focus. Colleges, however, differ in many aspects apart from years since establishment. One important difference is that new colleges are relatively small and generally more limited in terms of fields of education, i.e. though providing education within most broad fields of education they are more restricted or

[22] The income restriction differs somewhat between previous studies due to different outcome years and differences in the deflation of earnings. In this study earnings are adjusted to 1991 years prices.
[23] See Gartell and Regnér (2005, 2008) for tests of different local labor market controls and for further discussion.
[24] This follows the approach used by Eliasson (2006), which uses county of high school. County of birth and county of high school are highly correlated, but county of birth is less likely to influence college outcomes.
[25] Regional unemployment rates are presented in appendix, *Figure A 3*.

specialized within those fields. The results presented in Gartell and Regnér (2005, 2008) and SOU 2008:69 indicate that the composition of fields is important for estimated earnings differentials across colleges. The old universities are Uppsala University, Lund University, Stockholm University, Gothenburg University and Umeå University.[26] These were all established prior to 1966. All other colleges are, as in previous studies, considered as new colleges.

5 Empirical results

This section investigates the stability of college ranking. First, I examine if the results are sensitive to choices of earnings restrictions and outcome measure using the benchmark model. Second, I consider different methods and model specifications.

5.1 The benchmark model

The benchmark OLS-model includes age, county of birth, graduation year and semester, field and level of education and parental level of education as control variables. The outcome variable is annual earnings five years subsequent to graduation.[27] Initially, I impose the common restriction of an annual earning of at least 100 000 SEK.

Figure A 1 in the appendix shows that mean annual earnings five years following graduation varies considerably between individuals who have attended different colleges. The estimates of the benchmark model (see *Table A 5* and *Table A 6* in the appendix) show that most college coefficients are significantly different from the weighted mean. Roughly, the five top ranking colleges are associated with significant and positive earnings differentials while the following seven college coefficients are not significantly different from the average, and the last 13 colleges are associated with significant and negative earnings differentials. These results concern both men and women, but the estimated college coefficients are generally larger for men than for women. This can be seen from the WASD-estimates, which show larger earnings

[26] See appendix *Table A 4*, for the distribution of students across colleges.
[27] The follow-up period does not affect the ranking of colleges. Looking at mean earnings, the estimated rank correlations using a five year follow-up period compared to using a one year or a ten year follow-up period were about 0.9 in both cases.

variability across colleges for men. However, the difference between the most positive and most negative coefficient is larger for women than for men; for women the estimated coefficients vary between 0.03 and –0.16, for men estimated coefficients vary between 0.06 and –0.10. These estimates imply that earnings differentials across colleges vary between 3 and –16 percent for women and between 6 and –10 percent for men.

The ranking of the old colleges varies between 1 and 15 for women and 4 and 21 for men (see *Table 1*). This suggests that the age of the college is not a very important determinant for the ranking of the college. The age of the college is strongly related to observed college quality as it is conventionally measured.[28] Hence, the results suggest that there is little association between college quality as measured and earnings. This result is confirmed in a study by Holmlund (2009). Holmlund finds only a weak link between observed college quality and earnings in Sweden. However, observable college quality indicators may also be highly correlated with both signal effects and selection of students. In all, these results suggest that there is either no relation between the quality of education and earnings, or that observable college quality indicators are poor approximates for the quality of education.

Comparing men and women, the Spearman rank correlation is 0.69 and significant. All of the five top ranking colleges for women are found in the upper half of the ranking for men. But only three of the five bottom ranking colleges for women are found in the lower half of ranking for men.

[28] See Gartell and Regnér (2008) for a discussion on college effects and college quality. See e.g. Forneng et al (2007) and Holmlund (2009) for ranking of colleges with respect to observable college quality indicators.

Table 1. Ranking of colleges for men and women based on estimated college coefficients on earnings 5 years subsequent to graduation; annual earnings > 100 000 SEK

Rank	Women	Men
1	**Uppsala Univ.***	**Linköping Univ**
2	**Linköping Univ**	Royal Inst. of Tech.
3	**Malmö Univ.**	Chalmers Univ. of Tech
4	**Växjö Univ.**	**Lund Univ.***
5	**Lund Univ.***	Univ. of Skövde
6	Royal Inst. of Tech.	Mälardalen Univ.
7	Chalmers Univ. of Tech	**Malmö Univ.**
8	Stockholm Univ.*	Univ. of Gothenburg*
9	Mälardalen Univ.	Luleå Univ. of Tech.
10	Univ. of Gothenburg*	*Univ. West*
11	Blekinge Univ. of Tech.	*Univ. of Kalmar*
12	Univ. of Skövde	**Växjö Univ.**
13	Karlstad Univ.	**Uppsala Univ.***
14	Luleå Univ. of Tech.	Blekinge Univ. of Tech.
15	Umeå Univ.*	Karlstad Univ.
16	Univ. of Gävle	Stockholm Univ.*
17	Dalarna Univ. College	Halmstad Univ.
18	Mid Sweden Univ.	Dalarna Univ. College
19	Örebro Univ.	*Jönköping Univ.*
20	Halmstad Univ.	Örebro Univ.
21	*Univ. of Kalmar*	Umeå Univ.*
22	*Univ. West*	*Kristianstad Univ.*
23	*Jönköping Univ.*	Univ. of Gävle
24	*Kristianstad Univ.*	Mid Sweden Univ.
25	*Univ. College of Borås*	*Univ. College of Borås*
Spearman	1	0.685 (0.000)
WASD	0.025	0.037
Observations	92998	74214

Note: variables included are college dummies, age, age squared, region of birth, graduation year and semester and semester, field and level of education, parental level of education. The top 5 ranking colleges for women are indicated with bold letters and the bottom 5 ranking colleges are indicated in italics. Old colleges are indicated with a star (*).

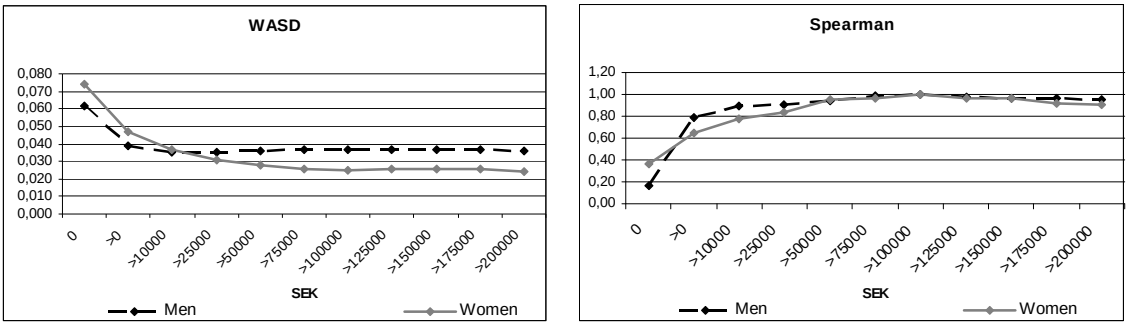
5.1.1 The role of earnings restrictions

Annual earnings are a combination of number of hours worked, and hourly wages. In order to capture productivity effects researchers usually invoke a restriction on annual earnings of at least 100 000 SEK; Antelius and Björklund (2000) find this to be a good approximation for full-time employment.

Figure 2 shows the Spearman rank correlations and the WASD-estimates across different earnings restrictions. The WASD-estimates (the earnings variability across colleges), decrease with the earnings restriction but is rather stable when the earnings restriction is at least 10 000 SEK. The Spearman rank correlation is close to one when

the earnings restriction is at least 50 000 SEK.[29] In all, this shows that the earnings restriction is not important for the ranking of colleges, as long as individuals with no observations on earnings are excluded. The results are somewhat more sensitive for women than men. One possible explanation is that part-time work is more frequent among women.

Figure 2. Spearman rank correlations and WASD measures across earnings restrictions. Based on estimated college coefficients on earnings 5 years subsequent to graduation



5.1.2 The role of unemployment

Unemployment immediately upon graduation is used as an alternative outcome variable. This outcome measure has the advantage that it is less affected by post-graduation experiences.

Figure A 2 in the appendix shows that the share of individuals registered at the public employment office at graduation varies considerably across colleges.[30]

The results in *Table 2* show that the Spearman rank correlation based on unemployment risks is statistically significant and about -0.7 for both men and women.[31] A negative Spearman rank correlation suggests that about the same colleges that are associated with relatively low earnings five years from graduation are also associated with a relatively high risk of unemployment at graduation and vice versa. However, for women only three of the five top ranking colleges with respect to earnings are found in the upper half of the unemployment risks distribution, and four of the five

[29] Significant levels and the exact rankings of colleges are not presented, but may be obtained from the author.
[30] The ranking of colleges is not much affected by which category of registered unemployment that is used. Investigating mean shares, excluding job changers compared to including all registrations at the employment office produces a Spearman rank correlation of 0.97, and to include only full-time unemployed results in a rank correlation of 0.79. Moreover, to exclude individuals with very short unemployment spells, i.e. less than a month, will result in a Spearman rank correlation that is 0.99 (compared to including all registrations at the employment office). The median unemployment spell is about 6-7 month, and less than 5 % of the unemployment durations are shorter than a month.
[31] The underlying estimates are presented in *Table A 5* and *Table A 6* in the appendix.

lowest ranking colleges are found in the lower half of the unemployment risks distribution. This suggests that post-graduation experiences of women may affect the ranking of colleges. For men, the college ranking is stable across the outcome measures.

Table 2. Ranking of colleges across models based on estimated college coefficients on earnings 5 years subsequent to graduation and the risk of unemployment at graduation

Rank	**Women**		**Men**	
	Earnings. (Annual earnings > 100 000 SEK)	Risk of Unemployment. (From low to high)	Earnings. (Annual earnings > 100 000 SEK)	Risk of Unemployment. (From low to high)
1	**Uppsala Univ.***	Royal Inst. of Tech.	**Linköping Univ**	**Royal Inst. of Tech.**
2	**Linköping Univ**	**Uppsala Univ.***	**Royal Inst. of Tech.**	**Linköping Univ**
3	**Malmö Univ.**	Stockholm Univ.*	**Chalmers Univ. of Tech**	Uppsala Univ.*
4	**Växjö Univ.**	Chalmers Univ. of Tech	**Lund Univ.***	Stockholm Univ.*
5	**Lund Univ.***	**Lund Univ.***	**Univ. of Skövde**	**Chalmers Univ. of Tech**
6	Royal Inst. of Tech.	Dalarna Univ. College	Mälardalen Univ.	**Lund Univ.***
7	Chalmers Univ. of Tech	**Linköping Univ.**	Malmö Univ.	**Univ. of Skövde**
8	Stockholm Univ.*	Univ. of Skövde	Univ. of Gothenburg*	Mälardalen Univ.
9	Mälardalen Univ.	Mälardalen Univ.	Luleå Univ. of Tech.	Univ. of Gothenburg*
10	Univ. of Gothenburg*	*Jönköping Univ.*	Univ. West	Dalarna Univ. College
11	Blekinge Univ. of Tech.	Univ. of Gothenburg*	Univ. of Kalmar	Jönköping Univ.
12	Univ. of Skövde	Karlstad Univ.	Växjö Univ.	Växjö Univ.
13	Karlstad Univ.	Mid Sweden Univ.	Uppsala Univ.*	Blekinge Univ. of Tech.
14	Luleå Univ. of Tech.	**Malmö Univ**	Blekinge Univ. of Tech.	Malmö Univ.
15	Umeå Univ.*	**Växjö Univ.**	Karlstad Univ.	Örebro Univ.
16	Univ. of Gävle	Umeå Univ.*	Stockholm Univ.*	*Univ. of Gävle*
17	Dalarna Univ. College	Halmstad Univ.	Halmstad Univ.	Luleå Univ. of Tech.
18	Mid Sweden Univ.	Blekinge Univ. of Tech.	Dalarna Univ. College	Univ. West
19	Örebro Univ.	Örebro Univ.	Jönköping Univ.	Karlstad Univ.
20	Halmstad Univ.	Univ. of Gävle	Örebro Univ.	Univ. of Kalmar
21	*Univ. of Kalmar*	*Univ. College of Borås*	*Umeå Univ.**	*Mid Sweden Univ.*
22	*Univ. West*	*Univ. West*	*Kristianstad Univ.*	*Umeå Univ.**
23	*Jönköping Univ.*	*Kristianstad Univ.*	*Univ. of Gävle*	*Kristianstad Univ.*
24	*Kristianstad Univ.*	Luleå Univ. of Tech	*Mid Sweden Univ.*	Halmstad Univ.
25	*Univ. College of Borås*	*Univ. of Kalmar*	*Univ. College of Borås*	*Univ. College of Borås*
Spearman	1	-0.666 (0.000)	1	-0.695 (0.000)
WASD	0.025	0.210	0.037	0.184
Observations	92998	121834	74214	84177

Note: variables included are college dummies, age, age squared, region of birth, graduation year and semester, field and level of education, parental level of education. The top 5 ranking colleges for annual earnings > 100 000 SEK are indicated by bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

5.2 Ranking sensitivity to model and method

Whether the ranking of colleges is sensitive to choices of models and methods is examined in this sub-section. First, an alternative control for regional labor market conditions is investigated. Second, using the sub-sample with high-school grades,

additional control variables are added. Third, sibling fixed effects are estimated.[32] Finally, I investigate whether college ranking varies across educational areas.

5.2.1 The different samples used

As a starting point, I use the benchmark model to analyze whether the ranking of colleges depends on the samples used when estimating earnings differentials across colleges. A sub-sample of young college graduates for whom I have data on e.g. grades from high school are used in order to compare with results reported in Eliasson (2006). In order to compare with the results in Lindahl and Regnér (2005) I use a sample of siblings, who have been identified through family variables included in the data base. *Table A 2* and *Table A 3* in the appendix show that there are some differences between samples. For example individuals in the siblings-sample and in the grade-sample are on average younger, have a longer education and have better educated parents compared to individuals in the full sample. But in other respects the samples are similar.

For women, the Spearman rank correlations are positive and significant across samples; 0.79 using the grade-sample and 0.62 using siblings (see *Table 3*). All five top and bottom ranking colleges in the full sample are also found in the upper and lower half of the ranking in these samples. The number of significant estimates is reduced from 17 in the full sample to 8 and 5 in the grade-sample and siblings-sample, respectively.

For men, the Spearman rank correlations are about 0.85 both using the grade-sample and siblings. All of the five top and bottom ranking colleges in the full sample are also, respectively, found in the upper and lower half of the ranking in these samples. The number of significant estimates is reduced from 17 in the full sample to 10 for both the grade-sample and siblings-sample.

In all, the ranking of colleges are stable across samples. However, for both men and women, the number of significant coefficients is substantially reduced using the two

[32] Moreover, using the benchmark model county of birth, which is correlated with college proximity, was used to instrument for college choice. The F-test rejects the null hypothesis that the coefficients of the instruments equals zero and the J-statistic can not reject the null hypothesis that all instruments are exogenous, except for men from a non-academic background. Hence, the instruments may be considered as relevant and exogenous, with the exception for men from a non-academic background. However, the estimated effects were very imprecise. The results are not presented but may be obtained from the author.

alternative samples. For siblings this is mainly a result of larger standard errors. For the grade-sample, the earnings variability across colleges is smaller. Hence, the size of the estimated college coefficients is smaller. The most apparent difference between the grade-sample and the full sample is that the grade-sample consists of substantially younger individuals.

Table 3. Ranking of colleges across samples based on estimated college coefficients on earnings 5 years subsequent to graduation

Rank	Women			Men		
	Full sample	Grade-sample	Siblings	Full sample	Grade-sample	Siblings
1	**Uppsala Univ.***	**Malmö Univ**	**Malmö Univ**	**Linköping Univ**	**Univ. of Skövde**	Malmö Univ.
2	**Linköping Univ**	**Uppsala Univ.***	**Växjö Univ.**	**Royal Inst. of Tech.**	**Royal Inst. of Tech.**	**Linköping Univ.**
3	**Malmö Univ.**	Chalmers Univ. of Tech	**Linköping Univ.**	**Chalmers Univ. of Tech**	Mälardalen Univ.	**Chalmers Univ. of Tech**
4	**Växjö Univ.**	Royal Inst. of Tech.	**Lund Univ.***	**Lund Univ.***	Univ. of Kalmar	**Royal Inst. of Tech.**
5	**Lund Univ.***	Mälardalen Univ.	Royal Inst. of Tech.	**Univ. of Skövde**	**Lund Univ.***	**Lund Univ.***
6	Royal Inst. of Tech.	**Växjö Univ.**	**Uppsala Univ.***	Mälardalen Univ.	**Linköping Univ**	Mälardalen Univ.
7	Chalmers Univ. of Tech	**Lund Univ.***	Luleå Univ. of Tech	Malmö Univ.	**Chalmers Univ. of Tech**	**Univ. of Skövde**
8	Stockholm Univ.*	Stockholm Univ.*	Halmstad Univ.	Univ. of Gothenburg*	Blekinge Univ. of Tech.	Univ. of Kalmar
9	Mälardalen Univ.	**Linköping Univ.**	Örebro Univ.	Luleå Univ. of Tech.	Malmö Univ.	Luleå Univ. of Tech.
10	Univ. of Gothenburg*	Univ. of Gothenburg*	Univ. of Skövde	Univ. West	Luleå Univ. of Tech.	Dalarna Univ. College
11	Blekinge Univ. of Tech.	Dalarna Univ. College	Dalarna Univ. College	Univ. of Kalmar	Univ. West	Växjö Univ.
12	Univ. of Skövde	Blekinge Univ. of Tech.	*Kristianstad Univ.*	Växjö Univ.	Univ. of Gothenburg*	Univ. of Gothenburg*
13	Karlstad Univ.	*Univ. West*	Karlstad Univ.	Uppsala Univ.*	Dalarna Univ. College	Karlstad Univ.
14	Luleå Univ. of Tech.	Univ. of Gävle	Univ. of Gothenburg*	Blekinge Univ. of Tech.	Karlstad Univ.	Jönköping Univ.
15	Umeå Univ.*	Karlstad Univ.	Chalmers Univ. of Tech	Karlstad Univ.	Växjö Univ.	Blekinge Univ. of Tech.
16	Univ. of Gävle	Halmstad Univ.	Blekinge Univ. of Tech.	Stockholm Univ.*	Jönköping Univ.	*Univ. of Gävle*
17	Dalarna Univ. College	Örebro Univ.	Mid Sweden Univ.	Halmstad Univ.	Halmstad Univ.	Uppsala Univ.*
18	Mid Sweden Univ.	*Univ. of Kalmar*	Stockholm Univ.*	Dalarna Univ. College	Stockholm Univ.*	Halmstad Univ.
19	Örebro Univ.	*Jönköping Univ.*	Univ. of Gävle	Jönköping Univ.	Örebro Univ.	Univ. West
20	Halmstad Univ.	Mid Sweden Univ.	*Jönköping Univ.*	Örebro Univ.	*Kristianstad Univ.*	*Umeå Univ.**
21	*Univ. of Kalmar*	*Kristianstad Univ.*	Umeå Univ.*	*Umeå Univ.**	*Univ. of Gävle*	Stockholm Univ.*
22	*Univ. West*	Luleå Univ. of Tech	*Univ. of Kalmar*	*Kristianstad Univ.*	*Univ. College of Borås*	*Mid Sweden Univ.*
23	*Jönköping Univ.*	Univ. of Skövde	*Univ. West*	*Univ. of Gävle*	*Umeå Univ.**	*Kristianstad Univ.*
24	*Kristianstad Univ.*	Umeå Univ.*	Mälardalen Univ.	*Mid Sweden Univ.*	Uppsala Univ.*	Örebro Univ.
25	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	*Mid Sweden Univ.*	*Univ. College of Borås*
Spearman	1	0.789 (0.000)	0.615 (0.001)	1	0.859 (0.000)	0.862 (0.000)
WASD	0.025	0.014	0.023	0.037	0.030	0.040
Observations	92998	29751	7915	74214	22872	8260

Note: variables included are college dummies, age, age squared, region of birth, graduation year and semester, field and level of education, parental level of education. Annual earnings > 100 000 SEK. The top five ranking colleges in the full sample are indicated with bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

5.2.2 Stability of college ranking across methods and models

The stability of college ranking with respect to methods and models used in previous studies is investigated. As a starting point I analyze whether it matters if the models include county of birth or regional unemployment rates five years after graduation, i.e. at the time of observed earnings. Regional unemployment rates provide some information about local labor market conditions following graduation, but are not as highly correlated with college choice as county of work/residence.

The results in *Table 4* show that the Spearman rank correlation is about 0.9 and significant for both men and women, and the earnings variability is about the same.[33] Further, all colleges ranking among the five highest and five lowest colleges using county of birth as control variable are found respectively in the upper and lower half of the earnings distribution also if regional unemployment rates are used as control variable. That is, for both men and women, the ranking is stable for the choice of local labor market controls.

[33] Estimates are presented in *Table A 5* and *Table A 6* in the appendix.

Table 4. Ranking of colleges using different local labor market controls, based on estimated college coefficients on earnings 5 years subsequent to graduation

Rank	Women		Men	
	Benchmark model	Local unempl. rates	Benchmark model	Local unempl. rates
1	**Uppsala Univ.***	**Malmö Univ**	**Linköping Univ**	**Linköping Univ**
2	**Linköping Univ**	**Uppsala Univ.***	**Royal Inst. Of Tech.**	**Royal Inst. of Tech.**
3	**Malmö Univ.**	**Lund Univ.***	**Chalmers Univ. of**	**Lund Univ.***
4	**Växjö Univ.**	**Linköping Univ.**	**Lund Univ.***	**Chalmers Univ. of**
5	**Lund Univ.***	Luleå Univ. of Tech	**Univ. of Skövde**	Luleå Univ. of Tech.
6	Royal Inst. of Tech.	Univ. of Gävle	Mälardalen Univ.	**Univ. of Skövde**
7	Chalmers Univ. of Tech	Mälardalen Univ.	Malmö Univ.	Mälardalen Univ.
8	Stockholm Univ.*	Royal Inst. of Tech.	Univ. of Gothenburg*	Malmö Univ.
9	Mälardalen Univ.	Chalmers Univ. of Tech	Luleå Univ. of Tech.	Karlstad Univ.
10	Univ. of Gothenburg*	Blekinge Univ. of Tech.	Univ. West	Blekinge Univ. of Tech.
11	Blekinge Univ. of Tech.	**Växjö Univ.**	Univ. of Kalmar	Univ. of Kalmar
12	Univ. of Skövde	Univ. of Gothenburg*	Växjö Univ.	Univ. of Gothenburg*
13	Karlstad Univ.	Stockholm Univ.*	Uppsala Univ.*	Dalarna Univ. College
14	Luleå Univ. of Tech.	Karlstad Univ.	Blekinge Univ. of Tech.	Univ. West
15	Umeå Univ.*	Dalarna Univ. College	Karlstad Univ.	*Univ. of Gävle*
16	Univ. of Gävle	Univ. of Skövde	Stockholm Univ.*	Uppsala Univ.*
17	Dalarna Univ. College	Mid Sweden Univ.	Halmstad Univ.	Stockholm Univ.*
18	Mid Sweden Univ.	Umeå Univ.*	Dalarna Univ. College	Växjö Univ.
19	Örebro Univ.	*Kristianstad Univ*	Jönköping Univ.	*Kristianstad Univ.*
20	Halmstad Univ.	Örebro Univ.	Örebro Univ.	Halmstad Univ.
21	*Univ. of Kalmar*	*Univ. of Kalmar*	*Umeå Univ.**	Örebro Univ.
22	*Univ. West*	*Univ. West*	*Kristianstad Univ.*	*Umeå Univ.**
23	*Jönköping Univ.*	Halmstad Univ.	*Univ. of Gävle*	*Mid Sweden Univ.*
24	*Kristianstad Univ.*	*Jönköping Univ.*	*Mid Sweden Univ.*	Jönköping Univ.
25	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*
Spearman	1	0.865 (0.000)	1	0.890 (0.000)
WASD	0.025	0.025	0.037	0.038
Observations	92998	92998	74214	74214

Note: variables included are college dummies, age, age squared, graduation year and semester, field and level of education, parental level of education. In the benchmark model region of birth (Stockholm, Gothenburg/Malmo, other) is used to control for local labor market conditions and in column 2 local unemployment rates at the time for observed earnings are used. Annual earnings > 100 000 SEK. The top 5 ranking colleges in the benchmark model are indicated by bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

Following Eliasson (2006), additional control variables are included for a sub-sample of graduates, i.e. the grade-sample. Variables included are the grade point average from high school, the program studied in high school, parental age, parental country of birth, parental earnings and capital incomes. These additional control variables do not affect the ranking of colleges for either men or women. The Spearman rank correlation is close to one and all top and bottom five ranking colleges are respectively found in the upper and lower half of the earnings distribution (see *Table 5*). The earnings variability (WASD) across colleges is only slightly reduced. Hence, the additional set of control variables can not explain much of the earnings variability across colleges. Moreover, the

same colleges are significant, with the exception of Lund and Kristianstad University that are significant for women only in the benchmark model.[34]

Table 5. Ranking of colleges across models based on estimated college coefficients on earnings 5 years subsequent to graduation

Rank	Women		Men	
	Benchmark model	Additional control variables added	Benchmark model	Additional control variables added
1	**Malmö Univ**	**Malmö Univ**	**Univ. of Skövde**	**Univ. of Skövde**
2	**Uppsala Univ.***	**Mälardalen Univ.**	**Royal Inst. of Tech.**	**Royal Inst. of Tech.**
3	**Chalmers Univ. of**	**Royal Inst. of Tech.**	**Mälardalen Univ.**	**Univ. of Kalmar**
4	**Royal Inst. of Tech.**	**Uppsala Univ.***	**Univ. of Kalmar**	**Mälardalen Univ.**
5	**Mälardalen Univ.**	**Chalmers Univ. of Tech**	**Lund Univ.***	Blekinge Univ. of Tech.
6	Växjö Univ.	Växjö Univ.	Linköping Univ	**Lund Univ.***
7	Lund Univ.*	Lund Univ.*	Chalmers Univ. of	Linköping Univ
8	Stockholm Univ.*	Blekinge Univ. of Tech.	Blekinge Univ. of	Chalmers Univ. of Tech
9	Linköping Univ.	Dalarna Univ. College	Malmö Univ.	Luleå Univ. of Tech.
10	Univ. of Gothenburg*	Linköping Univ.	Luleå Univ. of Tech.	Malmö Univ.
11	Dalarna Univ. College	Univ. West	Univ. West	Dalarna Univ. College
12	Blekinge Univ. of	Stockholm Univ.*	Univ. of Gothenburg*	Univ. West
13	Univ. West	Univ. of Gävle	Dalarna Univ. College	Karlstad Univ.
14	Univ. of Gävle	Halmstad Univ.	Karlstad Univ.	Univ. of Gothenburg*
15	Karlstad Univ.	Univ. of Gothenburg*	Växjö Univ.	Växjö Univ.
16	Halmstad Univ.	Örebro Univ.	Jönköping Univ.	Halmstad Univ.
17	Örebro Univ.	Mid Sweden Univ.	Halmstad Univ.	Örebro Univ.
18	Univ. of Kalmar	Karlstad Univ.	Stockholm Univ.*	Jönköping Univ.
19	Jönköping Univ.	*Kristianstad Univ.*	Örebro Univ.	*Univ. of Gävle*
20	Mid Sweden Univ.	Univ. of Kalmar	Kristianstad Univ.	*Univ. College of Borås*
21	*Kristianstad Univ.*	Jönköping Univ.	*Univ. of Gävle*	Stockholm Univ.*
22	*Luleå Univ. of Tech*	*Luleå Univ. of Tech*	*Univ. College of Borås*	Kristianstad Univ.
23	*Univ. of Skövde*	*Univ. of Skövde*	*Umeå Univ.**	*Umeå Univ.**
24	*Umeå Univ.**	*Umeå Univ.**	*Uppsala Univ.**	*Mid Sweden Univ.*
25	*Univ. College of Borås*	*Univ. College of Borås*	*Mid Sweden Univ.*	*Uppsala Univ.**
Spearman	1	0.954 (0.000)	1	0.978 (0.000)
WASD	0.014	0.010	0.030	0.026
Observations	29751	29751	22872	22872

Note: variables included are college dummies, age, age squared, region of birth, graduation year and semester, field and level of education, parental level of education. In column 2, grade point average from high school, the program studied in high school, parental age, parental country of birth, parental earnings and capital income are added. Annual earnings > 100 000 SEK. The top 5 ranking colleges in the benchmark model are indicated by bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

Eliasson (2006) finds that there are no significant earnings differentials across colleges when the additional control variables are added. However, Eliasson aggregate colleges into five groups based on their official status in 1999, e.g. whether their official status was university or university college. Hence, the results presented in Eliasson might be dependent on the aggregation of colleges. In order to analyze whether this is

[34] See *Table A 5* and *Table A 6* in the appendix.

the case I conduct the analyses using approximately the same aggregation of colleges as Eliasson.[35] The benchmark model shows that there are significant earnings differentials between individuals graduating from different groups of colleges. For both men and women, graduating from a first generation university compared to graduating from a college in the reference category (university college that does not provide postgraduate education), is associated with significant and positive earnings; the estimated earnings differential is about 2 percent.[36] Adding the additional control variables, there are no significant college coefficients either for men or women.[37] Hence, as in Eliasson, there are no systematic earnings differentials across college categories based on the age of the college.

Following Lindahl and Regnér (2005), I also estimate sibling fixed effects.[38] The results in *Table 6* show that, for both men and women, the results are stable for using sibling fixed effects.[39] The Spearman rank correlations are positive and significant, and the colleges ranking among the top and bottom five in the benchmark model also rank, respectively, in the top and bottom half based on the siblings fixed effect method. The exception is University of Kalmar that for women rank in the bottom five using the benchmark model, but in the upper part of the distribution in the siblings fixed effect model. The earnings variability across colleges is adjusted slightly upwards in this case. Even if some estimated college coefficients become larger, the number of significant coefficients is reduced as a result of the larger standard errors.[40]

Lindahl and Regnér (2005) find that the earnings differential between attending an old college and a new is about half estimating siblings fixed effect models, compared to estimating OLS.[41]

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[35] See Eliasson (2006) for the exact aggregation of colleges into groups. Colleges included are not exactly the same, since very specialized colleges are excluded in this study.
[36] Using the full sample, the estimated earnings premiums are 1–3 percent for women and 3–5 percent for men.The results are not presented but may be obtained from the author.
[37] However, for women it is a significant coefficient of –1.3 if graduating from a second generation university.
[38] Siblings are defined as having the same mother. To check the robustness, also full siblings were used. The estimated results are very similar and may be obtained from the author.
[39] To include the variables used by Eliasson (2006) in the sibling fixed effect models will reduce the sample to about 1500 individuals. However, the ranking of colleges is stable for the inclusion of the additional control variables; the Spearman rank correlation is about 0.98, for both men and women.
[40] See appendix *Table A 5* and *Table A 6*.
[41] Note that Lindahl and Regnér also presents estimates on a disaggregate level. They show that controlling for ability by using sibling fixed effects methods affect the college coefficients also on a disaggregate level. However, most

Table 6. Ranking of colleges across methods based on estimated college coefficients on earnings 5 years subsequent to graduation

Rank	Women		Men	
	Benchmark model	Sibling FE	Benchmark model	Sibling FE
1	**Malmö Univ**	**Malmö Univ**	**Malmö Univ.**	**Malmö Univ.**
2	**Växjö Univ.**	**Linköping Univ.**	**Linköping Univ**	Univ. of Kalmar
3	**Linköping Univ.**	Kristianstad Univ.	**Chalmers Univ. of**	**Linköping Univ**
4	**Lund Univ.***	**Växjö Univ.**	**Royal Inst. Of Tech.**	**Lund Univ.***
5	**Royal Inst. of Tech.**	**Lund Univ.***	**Lund Univ.***	Halmstad Univ.
6	Uppsala Univ.*	**Royal Inst. of Tech.**	Mälardalen Univ.	Mälardalen Univ.
7	Luleå Univ. of Tech	*Univ. of Kalmar*	Univ. of Skövde	**Royal Inst. of Tech.**
8	Halmstad Univ.	Luleå Univ. of Tech	Univ. of Kalmar	Växjö Univ.
9	Örebro Univ.	Karlstad Univ.	Luleå Univ. of Tech.	**Chalmers Univ. of**
10	Univ. of Skövde	Univ. of Skövde	Dalarna Univ. College	Univ. of Skövde
11	Dalarna Univ. College	Dalarna Univ. College	Växjö Univ.	Blekinge Univ. of Tech.
12	Kristianstad Univ.	Uppsala Univ.*	Univ. of Gothenburg*	Luleå Univ. of Tech.
13	Karlstad Univ.	Univ. of Gävle	Karlstad Univ.	Univ. of Gothenburg*
14	Univ. of Gothenburg*	Örebro Univ.	Jönköping Univ.	Dalarna Univ. College
15	Chalmers Univ. of	Univ. of Gothenburg*	Blekinge Univ. of Tech.	Jönköping Univ.
16	Blekinge Univ. of	Stockholm Univ.*	Univ. of Gävle	Uppsala Univ.*
17	Mid Sweden Univ.	Chalmers Univ. of	Uppsala Univ.*	*Mid Sweden Univ.*
18	Stockholm Univ.*	Mid Sweden Univ.	Halmstad Univ.	Umeå Univ.*
19	Univ. of Gävle	Halmstad Univ.	Univ. West	Univ. West
20	Jönköping Univ.	*Mälardalen Univ.*	Umeå Univ.*	*Univ. College of Borås*
21	*Umeå Univ.**	*Umeå Univ.**	*Stockholm Univ.**	Univ. of Gävle
22	*Univ. of Kalmar*	*Univ. West*	*Mid Sweden Univ.*	*Stockholm Univ.**
23	*Univ. West*	Blekinge Univ. of	*Kristianstad Univ.*	Karlstad Univ.
24	*Mälardalen Univ.*	Jönköping Univ.	*Örebro Univ.*	*Kristianstad Univ.*
25	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	*Örebro Univ.*
Spearman	1	0.754 (0.000)	1	0.809 (0.000)
WASD	0.023	0.026	0.040	0.043
Observations	7915	7915	8260	8260
No of groups		3823		3972

Note: variables included are college dummies, age, age squared, region of birth, graduation year and semester, field and level of education, parental level of education. In column 2 sibling fixed effects are estimated. Annual earnings > 100 000 SEK. The top 5 ranking colleges in the benchmark model are indicated by bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

To examine whether the results presented in Lindahl and Regnér depend on the aggregation of colleges, the estimated coefficient of graduating from an old college compared to a new college is investigated. In the benchmark model, for both men and women, to graduate from an old university is associated with 2–2.5 percent higher earnings.[42] However, in the siblings fixed effect model, the estimated coefficients are

estimates are still significant (they do not discuss whether the ranking is affected). However, they compare the results from the sibling fixed effect model with the results estimating OLS without any control for family background.

[42] To exclude parental level of education and area of residence, in line with Lindahl and Regnér, will result in somewhat larger earnings premium of graduating from an old college compared to a new; 2.9–3.4 percent. Using the

not significant. Hence, the earnings differential is reduced and there are no differences in estimated earnings between students graduating from old and new colleges. The ranking of colleges is somewhat more sensitive to using sibling fixed effects compared to including additional control variables, suggesting that sibling fixed effects may capture some unobserved characteristics that can not be controlled for by including observable covariates.

5.2.2.1 Summary

The ranking of colleges is clearly not identical across models and methods. However, the same colleges consistently turn up in the upper and lower half of the distribution. For example Malmö University turn up among the five top ranking colleges for women throughout and as *the* top ranking college, in all but one specification, Linköping and Lund University rank among the top five in all specifications with the exception of the grade-sample ranking and Uppsala university rank among the top six colleges with the exception of the sibling fixed effects ranking. At the bottom the University College of Borås rank as *the* lowest ranking college across methods and models, Jönköping University rank among the bottom seven throughout and University West rank among the bottom five with the exception of the grade-sample ranking.

For men, all colleges that rank among the top five in the full sample using the benchmark model rank among the top nine across methods and models. At the bottom, colleges ranking as the bottom five rank among the lowest nine throughout.

Moreover, the results in this section confirm the results in Eliasson (2006) and Lindahl and Regnér (2005), that estimated earnings differences between college categories based on the age of the college, are substantially biased if individual ability is not properly controlled for. However, considering individual colleges the earnings variability across colleges is not much affected by the choice of ability controls. One possible explanation is that individual ability is related to the dimension of the age of the college where selection generally is harder. However, on a disaggregate level, there are no systematic differences in how the coefficients for old vs new colleges are

full-sample, the earnings premium of graduating from an old college compared to a new is about 2.6 percent for women and 3.2 percent for men. The results are not presented but may be obtained by the author.

affected by ability controls. For both old and new colleges, some coefficients get larger and some smaller. For example, in the case of estimating sibling fixed effects for women, the coefficients of the five top ranking colleges become more positive estimating sibling fixed effects and the coefficients of the five bottom ranking colleges become more negative; an old college is found both among the top and bottom five ranking colleges. One implication of this result would be to abandon the new-old distinction for aggregating colleges, which seems to be quite arbitrary.

5.2.3 College ranking in different educational areas

The estimated college coefficients in previous sections are conditional on, among other things, fields of study and level of college education. Some colleges are specialized in a few fields. For example University College of Borås, which is consistently found in the bottom of the ranking, was at the time the only college in Sweden providing education for librarians, well known to have low earnings. Consequently, earnings differentials between students graduating from different colleges will at least partly be captured by differences in choices of educational fields. Therefore, it might be useful to estimate earnings differentials across colleges within fields of education instead. Another advantage in terms of reducing unobserved heterogeneity would be that students within a field compete on more similar labor markets, and probably they are more similar in terms of unobserved factors other than those analyzed in the previous sections.

There are many different fields of studies, and it is not feasible to estimate earnings differentials across colleges within all fields. In the following, the broad fields examined are teaching, social science, technology and health care. These fields are represented at many colleges and are popular among students.

Table A 2 and *Table A 3* in the appendix show that men and women differ in their educational choices. A large share of women chooses an education within healthcare or teaching, whereas men tend to prefer technology. Both women and men with an education within teaching earn considerably less than the average graduate. The share of individuals registered at the public employment office at graduation is higher for individuals with a degree in teaching or social science compared to individuals with a degree in technology or health care. Moreover, individuals with an education within

social science or technology are relatively young compared to graduates within teaching or health care.

The results in *Table 7* and *Table 8* show that the earnings variability across colleges is generally larger when estimating field specific college coefficients.[43] The earnings variability is substantially larger for individuals with an education within social science; about 0.08–0.1 compared to about 0.03 including all fields of education. The Spearman rank correlations indicate that the ranking of colleges is not stable across fields of education.[44]

For women, the Spearman rank correlation is significant and about 0.7 and 0.6 for teachers and social scientists respectively, compared to including all fields of education. Out of the five top ranking colleges in the full sample four are found in the upper part of the earnings distribution for teachers and social scientists respectively, and out of the five lowest ranking colleges, four and three show up in the lower half of the distribution for teachers and social scientist correspondingly. Hence, the ranking is similar to the ranking in the benchmark model, but only one of the two criteria for stability is satisfied. For women with an education within technology or healthcare the ranking is uncorrelated with the ranking in the full sample, i.e. the Spearman rank correlation is insignificant. Moreover, three and two of the five top ranking colleges in the full sample respectively turn up in the lower half of the ranking for women with an education within technology or healthcare. Thus none of the stability criteria hold. However, very few college estimates are statistically significant for women with an education within technology or health care, implying the ranking should be interpreted with caution.

[43] Estimates are presented in the appendix *Table A 7* and *Table A 8.*
[44] Spearman rank correlation is estimated with the restriction that only colleges with all examined fields of education are included. This reduces the number of colleges from 25 to 18.

Table 7. Ranking of colleges across fields of education based on estimated college coefficients on earnings 5 years subsequent to graduation, women

Rank	Benchmark model	Teaching	Social Science	Technology	Health care
1	**Uppsala Univ.***	**Malmö Univ**	**Lund Univ.***	**Linköping Univ.**	**Uppsala Univ.***
2	**Linköping Univ**	**Lund Univ.***	**Linköping Univ.**	Mälardalen Univ.	**Växjö Univ.**
3	**Malmö Univ**	Univ. of Gothenburg*	**Växjö Univ.**	*Halmstad Univ.*	Univ. of Gävle
4	**Växjö Univ.**	**Uppsala Univ.***	Mälardalen Univ.	*Kristianstad Univ.*	Luleå Univ. of Tech
5	**Lund Univ.***	Umeå Univ.*	Univ. of Gothenburg*	Univ. of Gävle	Mid Sweden Univ.
6	Mälardalen Univ.	**Linköping Univ.**	*Halmstad Univ.*	Umeå Univ.*	*Kristianstad Univ.*
7	Univ. of Gothenburg*	*Örebro Univ.*	**Uppsala Univ.***	*Univ. of Kalmar*	*Univ. College of Borås*
8	Karlstad Univ.	**Växjö Univ.**	Karlstad Univ.	**Malmö Univ**	**Malmö Univ**
9	Luleå Univ. of Tech.	Univ. of Gävle	*Örebro Univ.*	*Örebro Univ.*	Mälardalen Univ.
10	Umeå Univ.*	Karlstad Univ.	Luleå Univ. of Tech	Karlstad Univ.	**Lund Univ.***
11	Univ. of Gävle	Dalarna Univ. College	Univ. of Gävle	**Lund Univ.***	Univ. of Gothenburg*
12	Dalarna Univ. College	Luleå Univ. of Tech	Mid Sweden Univ.	Dalarna Univ. College	**Linköping Univ.**
13	Mid Sweden Univ.	*Halmstad Univ.*	Umeå Univ.*	**Uppsala Univ.***	Karlstad Univ.
14	*Örebro Univ.*	*Kristianstad Univ.*	Dalarna Univ. College	Mid Sweden Univ.	Umeå Univ.*
15	*Halmstad Univ.*	Mälardalen Univ.	*Kristianstad Univ.*	**Växjö Univ.**	*Univ. of Kalmar*
16	*Univ. of Kalmar*	*Univ. of Kalmar*	*Univ. of Kalmar*	Luleå Univ. of Tech	*Halmstad Univ.*
17	*Kristianstad Univ.*	Mid Sweden Univ.	**Malmö Univ**	Univ. of Gothenburg*	*Örebro Univ.*
18	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	Dalarna Univ. College
Spearman	1	0.719 (0.001)	0.606 (0.008)	0.001 (0.997)	0.317 (0.200)
WASD	0.025	0.057	0.079	0.037	0.018
Observations	92998	37107	22013	7362	17672

Note: variables included are college dummies, age, age sq, region of birth, graduation year and semester, level of education, parental level of education. The top 5 ranking colleges in the benchmark model are indicated by bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

Table 8. Ranking of colleges across fields of education based on estimated college coefficients on earnings 5 years subsequent to graduation, men

Rank	Benchmark model	Teaching	Social Science	Technology	Health care
1	**Linköping Univ**	**Univ. of Skövde**	**Lund Univ.***	**Linköping Univ**	Dalarna Univ. College
2	**Lund Univ.***	**Lund Univ.***	**Univ. of Gothenburg***	**Univ. of Gothenburg***	Univ. of Kalmar
3	**Univ. of Skövde**	Uppsala Univ.*	**Linköping Univ**	**Mälardalen Univ.**	**Mälardalen Univ.**
4	**Mälardalen Univ.**	**Univ. of Gothenburg***	Växjö Univ.	**Univ. of Skövde**	**Univ. of Gothenburg***
5	**Univ. of Gothenburg***	**Linköping Univ**	Univ. of Kalmar	**Lund Univ.***	*Univ. of Gävle*
6	Luleå Univ. of Tech.	Växjö Univ.	Uppsala Univ.*	Halmstad Univ.	Växjö Univ.
7	Univ. of Kalmar	*Örebro Univ.*	Karlstad Univ.	Univ. of Kalmar	Luleå Univ. of Tech.
8	Växjö Univ.	*Umeå Univ.**	Jönköping Univ.	Luleå Univ. of Tech.	*Univ. College of Borås*
9	Uppsala Univ.*	Dalarna Univ. College	**Mälardalen Univ.**	Dalarna Univ. College	**Univ. of Skövde**
10	Karlstad Univ.	Jönköping Univ.	Halmstad Univ.	Uppsala Univ.*	Karlstad Univ.
11	Halmstad Univ.	Luleå Univ. of Tech.	Luleå Univ. of Tech.	*Örebro Univ.*	*Mid Sweden Univ.*
12	Dalarna Univ. College	Univ. of Kalmar	*Mid Sweden Univ.*	Karlstad Univ.	**Linköping Univ**
13	Jönköping Univ.	*Univ. of Gävle*	*Umeå Univ.**	*Univ. of Gävle*	Halmstad Univ.
14	*Örebro Univ*.	Karlstad Univ.	*Örebro Univ.*	*Univ. College of Borås*	*Örebro Univ.*
15	*Umeå Univ.**	*Mid Sweden Univ.*	**Univ. of Skövde**	*Umeå Univ.**	**Lund Univ.***
16	*Univ. of Gävle*	Halmstad Univ.	*Univ. of Gävle*	Jönköping Univ.	Uppsala Univ.*
17	*Mid Sweden Univ.*	**Mälardalen Univ.**	Dalarna Univ. College	Växjö Univ.	*Umeå Univ.**
18	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	*Mid Sweden Univ.*	Jönköping Univ.
Spearman	1	0.536 (0.022)	0.664 (0.027)	0.806 (0.000)	0.156 (0.537)
WASD	0.032	0.050	0.097	0.033	0.056
Observations	74214	9879	19085	30129	5674

Note: variables included are college dummies, age, age sq, region of birth, graduation year and semester, level of education, parental level of education. The top 5 ranking colleges in the benchmark model are indicated by bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

For men, the Spearman rank correlation is significant and positive for individuals with an education within social science, technology or teaching compared to the full sample, but rather far from unity. Within technology, the five top and bottom ranking colleges are respectively found in the upper and lower half of the earnings distribution and the ranking may be considered as stable. For individuals with a degree in teaching or social science four of the top five ranking colleges are found in the upper part of the earnings distribution and three and four of the bottom ranking colleges are found in the lower part of the earnings distribution. Hence, the college ranking for individuals with a degree within teaching or social science is similar to including all fields of education, but only one of the criteria for stability is satisfied. For men with an education within health care the Spearman rank correlation is insignificant, and the ranking is uncorrelated to the ranking of colleges in the full sample. Three of the five top ranking colleges in the full sample rank in the lower half of the earnings distribution, and two of the bottom five colleges in the full sample rank in the upper half. However, relatively few men graduate in health care.

In all, the ranking of colleges appear very sensitive to the field of education. There are some potential explanations for this result. College coefficients within fields are estimated on a sample more similar both in terms of unobserved individual characteristics and labor market conditions. If the distribution of unobserved factors across individuals graduating from different fields of education is systematic and some colleges are dominated by a few fields of education, estimated earnings coefficients of college attended may be partly a result of these factors. Another possible explanation is that not only do average earnings vary by field of education, i.e. the intercept, but the effect of a given set of observable characteristics on the wage career may vary by field of education, i.e. the slope of the wage path over time. However, if the ranking of colleges is stable for including interaction variables between field of education and the other observable control variables the latter explanation is not valid.

The results presented in *Table 9* demonstrate that neither the ranking of colleges nor the earnings variability across colleges, are affected by including interaction variables.[45] For both men and women the Spearman rank correlation is significant and strongly positive and all of the top and bottom five ranking colleges in the benchmark model are found in the top and bottom half of the ranking using the interaction model. The earnings variability across colleges is only slightly reduced. Hence, presumably different effects of observable covariates on the wage careers for individuals graduating in different fields can not explain earnings differentials across colleges.

[45] Estimates are presented in the appendix *Table A 7* and *Table A 8*. To use interaction variables including only individuals with the four examined fields of education will produce very similar results; the results may be obtained from the author.

Table 9. Ranking of colleges based on estimated college coefficients on earnings 5 years subsequent to graduation, using interaction variables

Rank	Women		Men	
	Benchmark model	Interactions	Benchmark model	Interactions
1	**Uppsala Univ.***	Royal Inst. of Tech.	**Linköping Univ**	**Royal Inst. of Tech.**
2	**Linköping Univ**	**Uppsala Univ.***	**Royal Inst. of Tech.**	**Linköping Univ**
3	**Malmö Univ.**	**Linköping Univ**	**Chalmers Univ. of Tech**	**Chalmers Univ. of Tech**
4	**Växjö Univ.**	Stockholm Univ.*	**Lund Univ.***	**Lund Univ.***
5	**Lund Univ.***	**Lund Univ.***	**Univ. of Skövde**	Mälardalen Univ.
6	Royal Inst. of Tech.	**Malmö Univ.**	Mälardalen Univ.	**Univ. of Skövde**
7	Chalmers Univ. of Tech	**Växjö Univ.**	Malmö Univ.	Univ. of Gothenburg*
8	Stockholm Univ.*	Mälardalen Univ.	Univ. of Gothenburg*	Univ. of Kalmar
9	Mälardalen Univ.	Univ. of Gothenburg*	Luleå Univ. of Tech.	Luleå Univ. of Tech.
10	Univ. of Gothenburg*	Chalmers Univ. of Tech	Univ. West	Blekinge Univ. of Tech.
11	Blekinge Univ. of Tech.	Karlstad Univ.	Univ. of Kalmar	Växjö Univ.
12	Univ. of Skövde	Halmstad Univ.	Växjö Univ.	Uppsala Univ.*
13	Karlstad Univ.	Örebro Univ.	Uppsala Univ.*	Karlstad Univ.
14	Luleå Univ. of Tech.	Univ. of Gävle	Blekinge Univ. of Tech.	Malmö Univ.
15	Umeå Univ.*	Mid Sweden Univ.	Karlstad Univ.	Halmstad Univ.
16	Univ. of Gävle	Luleå Univ. of Tech.	Stockholm Univ.*	Univ. West
17	Dalarna Univ. College	Umeå Univ.*	Halmstad Univ.	Stockholm Univ.*
18	Mid Sweden Univ.	*Kristianstad Univ.*	Dalarna Univ. College	Dalarna Univ. College
19	Örebro Univ.	*Jönköping Univ.*	Jönköping Univ.	Jönköping Univ.
20	Halmstad Univ.	Dalarna Univ. College	Örebro Univ.	*Kristianstad Univ.*
21	*Univ. of Kalmar*	*Univ. of Kalmar*	*Umeå Univ.**	Örebro Univ.
22	*Univ. West*	Univ. of Skövde	*Kristianstad Univ.*	*Univ. of Gävle*
23	*Jönköping Univ.*	Blekinge Univ. of Tech.	*Univ. of Gävle*	*Mid Sweden Univ.*
24	*Kristianstad Univ.*	*Univ. West*	*Mid Sweden Univ.*	*Umeå Univ.**
25	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*	*Univ. College of Borås*
Spearman	1	0.805	1	0.945
		(0.000)		(0.000)
WASD	0.025	0.022	0.037	0.032
Observations	92998	92998	74214	74214

Note: variables included are college dummies, age, age sq, region of birth, graduation year and semester, level and field of education, parental level of education. In the interaction model all control variables are interacted with field of education. The top 5 ranking colleges in the benchmark model are indicated by bold letters, and the bottom 5 colleges are indicated in italics. Old colleges are indicated with a star (*).

6 Conclusions

How stable is the ranking of colleges to the choice of method and model specifications that have been used in previous studies? The exact ranking varies a great deal across methods and model specifications. Even so, the earnings equations still contain information about which colleges that on average rank among the top and bottom half of the earnings distribution. The ranking of colleges is somewhat more sensitive using sibling fixed effects compared to OLS-effects with a large set of control variables, suggesting that sibling fixed effects may capture some unobserved characteristics that can not be controlled for by including observable covariates. On the other hand the sibling sample is small and, consequently, estimated college coefficients are more imprecise.

Previous studies show that when proper adjustment for student ability is made, estimated differentials across college categories based on the age of the college, are profoundly reduced or even vanish. This methodological study confirms this finding on an aggregate level. However, on a disaggregate level, college coefficients are not much affected by choice of ability controls. One implication of this result is that we should not seek the reason for estimated earnings differentials across colleges within the dimension old-new colleges or along quality as measured in the literature.

The association between college attended and future outcomes may be explained by several factors, e.g. selection of students, connection to the local labor market, field of study, the quality of education, signal effects etc. This study does not try to disentangle these different factors or establish whether the estimated coefficients are causal effects. However, the different rankings of colleges across fields of education, and the finding that old colleges are found throughout the earnings differential distribution, suggests that the "quality" of the college is not likely to be measured by how ancient the institution is, or else observable college quality indicators are very poor, since these are highly correlated with the age of the institution. Instead, the estimated college coefficients are due to unobserved factors or quality or signal effects associated with a

few dominating fields of education. Hence, this type of college ranking must be very cautiously interpreted.

For future research, new measures are needed. The college attended by a student is highly correlated with factors on different levels, such as e.g. field of study, constraints on selection and local labor markets, suggesting that multilevel analysis may be one way to go. Further, the new-old distinction for grouping colleges should be abandoned. As a complement to empirical studies, it is pertinent - for example by way of qualitative methods such as interviews - to also look into employers' motives and attitudes.

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Appendix

Figure A 1. Mean annual earnings (in 1991 years prices) 5 years subsequent to graduation in 100-SEK

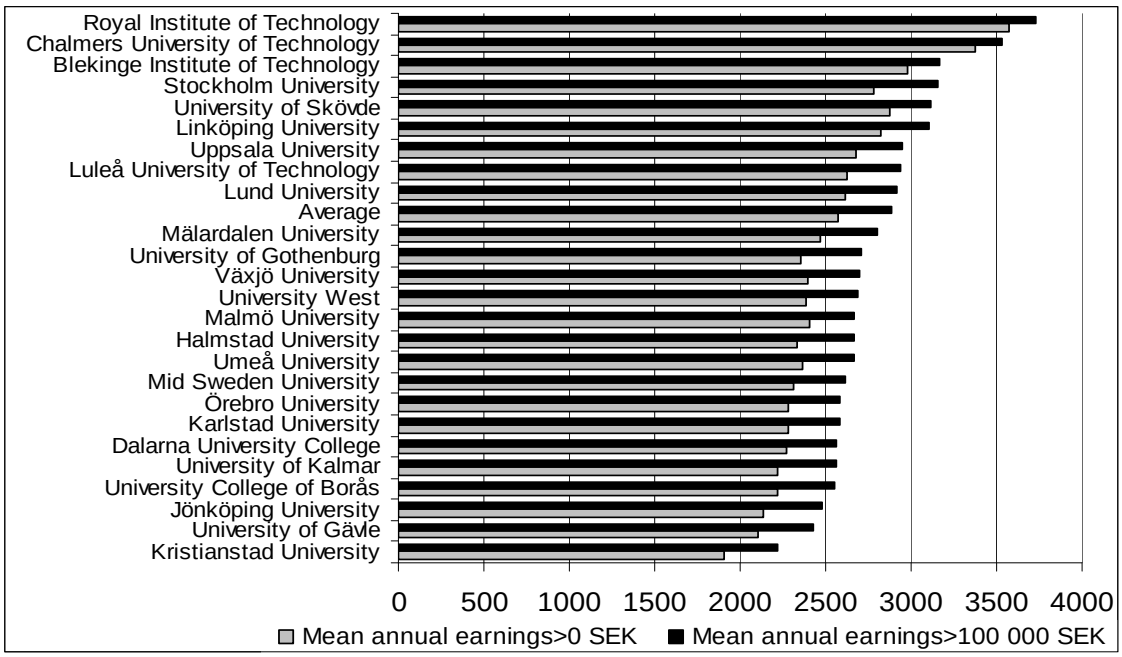
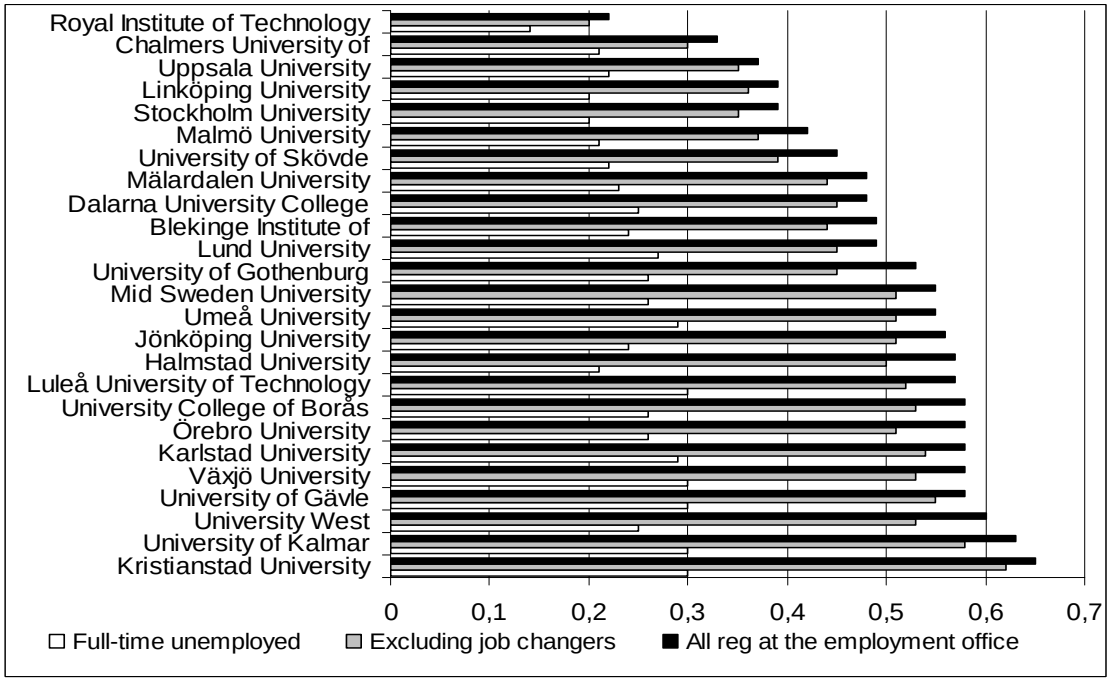


Figure A 2. Mean share of unemployed at graduation



Note: "All reg at the employment office" include all individuals with a registration at the employment office at graduation. "Excluding job changers" includes all individuals but those registered as job-changers. "Full-time unemployed" includes only individuals registered as full-time unemployed at graduation.

Table A 1. Variable list

Earnings	Annual earnings in 1991 year prices
Earnings=0	Annual earnings equals zero
Unempl	Dummy variable=1 if any unemployment with in a year from gradation, 0 otherwise
Women	Dummy variable=1 if women
Age	Age at graduation
Age sq	Age squared
Labor market control	
Stockholm	Dummy variable=1 if born in Stockholm county
Big city	Dummy variable=1 if born in Gothenburg or Malmö county
Other	Dummy variable=1 if born outside Stockholm, Gothenburg or Malmö
Reg Unempl	Continuous variable for regional unemployment rates.
Graduation year	Dummy variable=1 if graduated that year, 1991-1999.
Spring semester	Dummy variable=1 if graduating during spring semester, 0 otherwise
Field of education	
Teacher	Dummy variable=1 if field of education is teaching, 0 otherwise
Humaniora	Dummy variable=1 if field of education is humaniora, 0 otherwise
Science	Dummy variable=1 if field of education is science, 0 otherwise
Social science	Dummy variable=1 if field of education is social science, 0 otherwise
Technology	Dummy variable=1 if field of education is technology, 0 otherwise
Healthcare	Dummy variable=1 if field of education is healthcare, 0 otherwise
Service	Dummy variable=1 if field of education is service, 0 otherwise
Educ<3 y	Dummy variable=1 if education less than 3 years but at least two years
Educ=3 y	Dummy variable=1 if education equals 3 years
Educ>3 y	Dummy variable=1 if education more then 3 years
Parental education	
M<high sch	Dummy variable=1 if mothers education less than high school
M high sch	Dummy variable=1 if mothers education is high school
M univ≤3	Dummy variable=1 if mothers university education is at most 3 years
M univ>3	Dummy variable=1 if mothers university education is more than 3 years
M unknown	Dummy variable=1 if mothers education is unknown
F< high sch	Dummy variable=1 if fathers education less than high school
F high sch	Dummy variable=1 if fathers education is high school
F univ≤3	Dummy variable=1 if mothers university education is at most 3 years
F univ>3	Dummy variable=1 if mothers university education is more then 3 years
F unknown	Dummy variable=1 if fathers education is unknown
Additional variables	
Average grades (GPA)	Average grades from high school
HS social sc	Dummy variable=1 if program in high school was social science
HS science	Dummy variable=1 if program in high school was science
HS economy	Dummy variable=1 if program in high school was economy
HS tech	Dummy variable=1 if program in high school was technology
HS health	Dummy variable=1 if program in high school was health care
HS other	Dummy variable=1 if program in high school was “other
M age 91	Mothers age in 1991
F age 91	Fathers age in 1991
M Swe	Dummy variable=1 if mother born in Sweden
F Swe	Dummy variable=1 if farther born in Sweden

M earnings	Mothers annual earnings in 100-SEK
F earnings	Fathers annual earnings in 100-SEK
F pos cap inc	Fathers annual capital income in 100-SEK, if positive
F neg cap inc	Fathers annual capital income in 100-SEK, if negative
M pos cap inc	Mothers annual capital income in 100-SEK, if positive
M neg cap inc	Mothers annual capital income in 100-SEK, if negative

Figure A 3. Regional unemployment rates Swedish counties

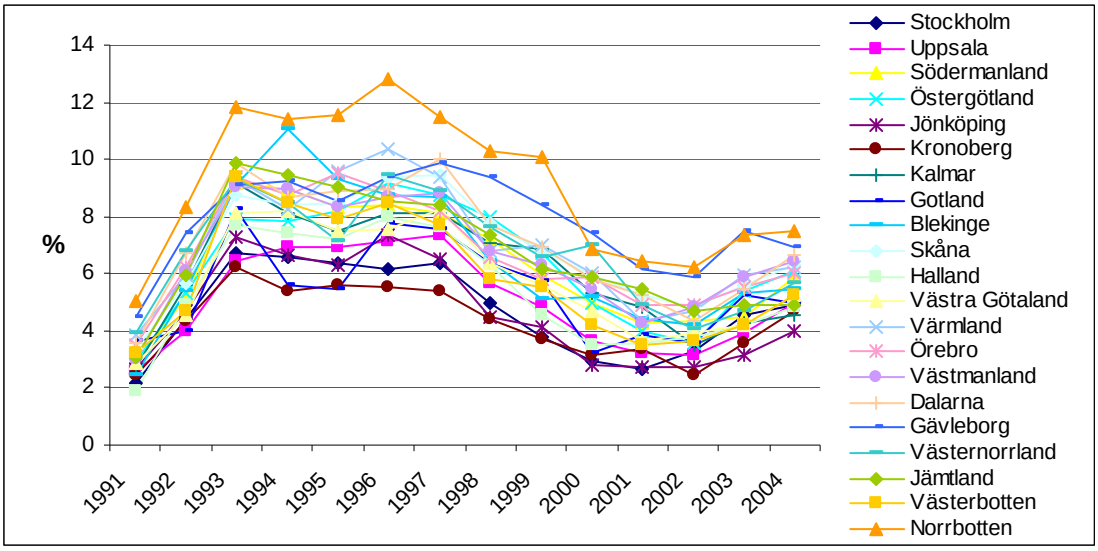


Table A 2. Descriptive statistics, women

	Probit	Full sample	Grade-sample	Siblings	Teaching	Social science	Technology	Health care
Earnings	-	2467.56	2567.18	2598.00	2067.07	2869.23	2994.30	2558.84
		(983.62)	(1064.03)	(1159.45)	(637.51)	(1215.18)	(1089.18)	(882.76)
Age	29.59	35.17	29.00	32.35	36.14	33.95	31.12	37.07
	(7.99)	(8.24)	(1.85)	(5.28)	(9.29)	(6.62)	(3.93)	(8.79)
Unempl	0.50	0.47	0.52	0.50	0.49	0.53	0.42	0.39
Reg unempl	-	5.44	4.78	5.26	5.76	5.12	5.21	5.42
		(1.80)	(1.27)	(1.77)	(1.92)	(1.72)	(1.69)	(1.64)
Stockholm	0.18	0.18	0.16	0.19	0.14	0.23	0.24	0.17
Big city	0.29	0.29	0.31	0.31	0.30	0.29	0.31	0.30
Other	0.53	0.53	0.52	0.50	0.57	0.49	0.45	0.53
Teacher	0.41	0.40	0.39	0.32	1	0	0	0
Humaniora	0.05	0.04	0.03	0.04	0	0	0	0
Social science	0.23	0.24	0.21	0.27	0	1	0	0
Science	0.05	0.05	0.06	0.07	0	0	0	0
Technology	0.07	0.08	0.12	0.13	0	0	1	0
Healthcare	0.18	0.19	0.17	0.16	0	0	0	1
Service	0.01	0.01	0.01	0.01	0	0	0	0
Educ<3 y	0.17	0.16	0.11	0.11	0.29	0.03	0.14	0.12
Educ=3 y	0.51	0.51	0.57	0.48	0.49	0.55	0.18	0.60
Educ>3 y	0.32	0.33	0.32	0.41	0.22	0.42	0.68	0.27
M<high sch	0.37	0.38	0.25	0.24	0.46	0.31	0.23	0.41
M high sch	0.25	0.25	0.33	0.26	0.25	0.25	0.27	0.23
M univ<3 y	0.14	0.13	0.18	0.18	0.10	0.16	0.19	0.13
M univ>3 y	0.22	0.22	0.22	0.30	0.17	0.26	0.29	0.21
M unknown	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02
F<high sch	0.37	0.38	0.30	0.26	0.45	0.31	0.24	0.40
F high sch	0.22	0.21	0.32	0.24	0.21	0.22	0.27	0.19
F univ<3 y	0.08	0.08	0.11	0.09	0.07	0.09	0.10	0.07
F univ>3 y	0.30	0.30	0.25	0.38	0.25	0.35	0.36	0.32
F unknown	0.02	0.02	0.03	0.03	0.02	0.03	0.03	0.02
GPA			3.80					
			(0.51)					
HS social sc			0.39					
HS science			0.20					
HS economy			0.18					
HS tech			0.12					
HS helth			0.10					
HS other			0.02					
M age 91			45.26					
			(4.66)					
F age 91			47.58					
			(5.10)					
M Swe			0.94					
F Swe			0.94					
M earnings			1359.80					
			(728.47)					
F earnings			2260.90					
			(1537.04)					
F pos cap inc			786.78					
			(5652.30)					
F neg cap inc			368.52					
			(428.39)					
M pos cap inc			161.01					
			(1221.07)					
M neg cap inc			185.04					
			(371.78)					
Observations	121834	92998	29751	7915	37107	22013	7362	17672

Note: Standard deviations in parenthesis. The probit sample, used to estimate the risk of unemployment at graduation, includes all individuals. The remaining samples include only individuals with annual earnings greater than 100 000 SEK.

Table A 3. Descriptive statistics, Men

	Probit	Full sample	Grade-sample	Siblings	Teaching	Social science	Technology	Health care
Earnings	-	3419.41	3665.50	3513.27	2464.00	3802.94	3591.19	3440.56
		(1972.46)	(2343.75)	(1788.49)	(710.85)	(3235.72)	(1264.63)	(1261.30)
Age	28.30	33.20	29.73	32.05	36.19	33.55	31.48	35.26
	(5.60)	(5.40)	(1.79)	(3.49)	(7.75)	(4.92)	(3.78)	(5.85)
Unempl	0.40	0.40	0.34	0.40	0.52	0.45	0.33	0.38
Reg unempl	-	5.31	4.71	5.20	5.52	5.11	5.35	5.47
		(1.77)	(1.19)	(1.76)	(1.81)	(1.75)	(1.76)	(1.75)
Stockholm	0.20	0.17	0.19	0.20	0.12	0.24	0.19	0.21
Big city	0.30	0.30	0.31	0.32	0.30	0.30	0.30	0.30
Other	0.50	0.50	0.50	0.48	0.58	0.46	0.50	0.49
Teacher	0.13	0.13	0.10	0.09	1	0	0	0
Humaniora	0.04	0.03	0.02	0.03	0	0	0	0
Social science	0.26	0.26	0.20	0.26	0	1	0	0
Science	0.08	0.08	0.08	0.08	0	0	0	0
Technology	0.39	0.41	0.53	0.45	0	0	1	0
Healthcare	0.07	0.08	0.05	0.08	0	0	0	1
Service	0.01	0.01	0.01	0.01	0	0	0	0
Educ<3 y	0.12	0.12	0.15	0.08	0.17	0.03	0.19	0.03
Educ=3 y	0.37	0.36	0.36	0.30	0.40	0.54	0.18	0.38
Educ>3 y	0.52	0.52	0.49	0.61	0.44	0.43	0.63	0.59
M<high sch	0.30	0.30	0.22	0.18	0.42	0.30	0.27	0.32
M high sch	0.26	0.26	0.32	0.23	0.25	0.24	0.29	0.21
M univ<3 y	0.16	0.16	0.19	0.20	0.12	0.17	0.18	0.16
M univ>3 y	0.26	0.25	0.25	0.36	0.20	0.27	0.25	0.29
M unknown	0.02	0.02	0.02	0.02	0.01	0.03	0.02	0.02
F<high sch	0.30	0.30	0.24	0.19	0.41	0.28	0.27	0.31
F high sch	0.24	0.24	0.31	0.22	0.21	0.22	0.28	0.18
F univ<3 y	0.09	0.10	0.13	0.10	0.08	0.10	0.11	0.07
F univ>3 y	0.34	0.33	0.29	0.45	0.28	0.37	0.31	0.41
F unknown	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03
GPA			3.73					
			(0.55)					
HS social sc			0.11					
HS science			0.19					
HS economy			0.14					
HS tech			0.55					
HS helth			0.01					
HS other			0.00					
M age 91			45.96					
			(4.53)					
F age 91			48.19					
			(4.98)					
M Swe			0.94					
F Swe			0.94					
M earnings			1402.37					
			(757.30)					
F earnings			2411.34					
			(1591.41)					
F pos cap inc			1111.19					
			(8527.21)					
F neg cap inc			382.64					
			(492.51)					
M pos cap inc			177.05					
			(1445.19)					
M neg cap inc			192.38					
			(249.79)					
Observations	84177	74214	22872	8260	9879	19085	30129	5674

Note: Standard deviations in parenthesis. The probit sample, used to estimate the risk of unemployment at graduation, includes all individuals. The remaining samples include only individuals with annual earnings greater than 100 000 SEK.

Table A 4. Distribution of students across colleges

Umeå Univ.	0.064	Univ. of Gothenburg*	0.100
Luleå Univ. of Tech.*	0.029	Chalmers Univ. of Tech.	0.041
Mid Sweden Univ.	0.034	Karlstad Univ.	0.029
Uppsala Univ.*	0.091	Univ. of Skövde	0.007
Univ. Of Gävle	0.017	Univ. College of Borås	0.014
Dalarna Univ. College	0.015	Halmstad Univ.	0.013
Mälardalen Univ.	0.017	Univ. of Kalmar	0.019
Örebro Univ.	0.032	Växjö Univ.	0.026
Stockholm Univ.*	0.074	Kristianstad Univ.	0.016
Royal Inst. of Tech.	0.047	Blekinge Inst. of Tech	0.005
Linköping Univ.	0.064	Univ. West	0.006
Jönköping Univ.	0.019	Malmö Univ.	0.006
		Lund Univ.*	0.132

Note: old colleges are indicated with a star (*).

Table A 5. Estimated college coefficients on risk of unemployment and annual earnings 5 years subsequent to graduation, women

	Benchmark model		**Grade-sample**		**Siblings**		**Risk of**
	(1)	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**	**unempl.**
Umeå Univ.*	-0.018**	-0.017**	-0.036**	-0.031**	-0.039**	-0.051*	0.220**
	(0.004)	(0.004)	(0.007)	(0.007)	(0.013)	(0.025)	(0.014)
Luleå Univ. of Tech.	-0.018**	0.012	-0.026**	-0.021*	0.007	0.005	0.390**
	(0.006)	(0.007)	(0.009)	(0.009)	(0.019)	(0.041)	(0.024)
Mid Sweden Univ.	-0.021**	-0.015**	-0.021	-0.009	-0.022	-0.036	0.178**
	(0.005)	(0.005)	(0.034)	(0.034)	(0.035)	(0.035)	(0.019)
Uppsala Univ.*	0.029**	0.022**	0.022**	0.016*	0.014	-0.007	-0.283**
	(0.004)	(0.004)	(0.007)	(0.007)	(0.013)	(0.019)	(0.012)
Univ. Of Gävle	-0.020**	0.005	-0.010	-0.002	-0.023	-0.010	0.278**
	(0.006)	(0.006)	(0.011)	(0.011)	(0.026)	(0.051)	(0.026)
Dalarna Univ. College	-0.021**	-0.010	0.002	0.004	-0.004	-0.004	-0.115**
	(0.008)	(0.008)	(0.012)	(0.013)	(0.027)	(0.052)	(0.029)
Mälardalen Univ.	0.002	0.004	0.012	0.022	-0.058	-0.051	0.105**
	(0.007)	(0.007)	(0.013)	(0.013)	(0.032)	(0.052)	(0.027)
Örebro Univ.	-0.022**	-0.019**	-0.016	-0.009	-0.003	-0.019	0.270**
	(0.005)	(0.005)	(0.009)	(0.009)	(0.018)	(0.035)	(0.020)
Stockholm Univ.*	0.004	-0.005	0.004	0.001	-0.023	-0.020	-0.205**
	(0.005)	(0.005)	(0.011)	(0.011)	(0.017)	(0.023)	(0.015)
Royal Inst. of Tech.	0.006	0.003	0.016	0.017	0.017	0.020	-0.334**
	(0.010)	(0.010)	(0.015)	(0.015)	(0.026)	(0.036)	(0.032)
Linköping Univ.	0.019**	0.019**	0.004	0.004	0.037*	0.057*	-0.061**
	(0.005)	(0.004)	(0.008)	(0.008)	(0.016)	(0.025)	(0.015)
Jönköping Univ.	-0.030**	-0.051**	-0.019*	-0.019*	-0.026	-0.065	0.107**
	(0.006)	(0.006)	(0.010)	(0.010)	(0.026)	(0.048)	(0.025)
Univ. of Gothenburg*	0.001	-0.004	0.002	-0.003	-0.010	-0.020	0.111**
	(0.003)	(0.003)	(0.006)	(0.006)	(0.012)	(0.020)	(0.011)
Chalmers Univ. of Tech.	0.004	0.002	0.020	0.013	-0.015	-0.021	-0.145**
	(0.011)	(0.011)	(0.017)	(0.017)	(0.028)	(0.039)	(0.035)
Karlstad Univ.	-0.012*	-0.006	-0.010	-0.012	-0.010	0.001	0.150**
	(0.005)	(0.005)	(0.009)	(0.009)	(0.022)	(0.037)	(0.021)
Univ. of Skövde	-0.008	-0.012	-0.029	-0.023	-0.004	0.000	0.048**
	(0.015)	(0.015)	(0.024)	(0.024)	(0.054)	(0.071)	(0.050)
Univ. College of Borås	-0.160**	-0.163**	-0.054**	-0.041**	-0.154**	-0.209**	0.305**

	(0.008)	(0.008)	(0.014)	(0.014)	(0.029)	(0.047)	(0.029)
Halmstad Univ.	-0.025**	-0.033**	-0.011	-0.003	-0.003	-0.037	0.235**
	(0.008)	(0.008)	(0.014)	(0.014)	(0.035)	(0.062)	(0.032)
Univ. of Kalmar	-0.027**	-0.030**	-0.017	-0.016	-0.039	0.006	0.474**
	(0.007)	(0.007)	(0.011)	(0.011)	(0.027)	(0.048)	(0.029)
Växjö Univ.	0.016**	-0.001	0.011	0.009	0.040	0.047	0.217**
	(0.006)	(0.006)	(0.010)	(0.010)	(0.021)	(0.038)	(0.023)
Kristianstad Univ.	-0.033**	-0.017**	-0.021*	-0.014	-0.005	0.055	0.384**
	(0.006)	(0.006)	(0.010)	(0.026)	(0.022)	(0.054)	(0.027)
Blekinge Inst. of Tech	-0.003	0.001	-0.005	0.006	-0.019**	-0.059**	0.259**
	(0.019)	(0.020)	(0.026)	(0.021)	(0.005)	(0.011)	(0.072)
Univ. West	-0.028*	-0.032**	-0.006	0.003	-0.043**	-0.056	0.336**
	(0.013)	(0.013)	(0.021)	(0.006)	(0.006)	(0.092)	(0.051)
Malmö Univ.	0.019	0.030**	0.034*	0.037*	0.056	0.093	0.190**
	(0.011)	(0.011)	(0.017)	(0.017)	(0.036)	(0.062)	(0.043)
Lund Univ.*	0.016**	0.019**	0.009*	0.007	0.030**	0.042**	-0.132**
	(0.002)	(0.002)	(0.004)	(0.004)	(0.008)	(0.013)	(0.008)
Control set 1 (Age, age sq, region of birth, graduation year and semester, field and level of education, parental level of education)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control set 2 (GPA, program in high school, parental; age, county of birth, earnings and capital inc)				Yes			
Observations	92998	92998	29751	29751	7951	7951 (3823)	121834
R-squared	0.27	0.27	0.27	0.27	0.26	W:0.21 B:0.17 O:0.18	0.08

Note: Differentials are expressed as the deviation from the (college-share weighted) mean. Standard errors are reported in parentheses and are calculated as described in Haisken-DeNew and Schmidt (1997). *Benchmark model (1)* is the full sample, using county of birth as labor market control. *Benchmark model (2)* is the full sample, using local unemployment rates as labor market control. *Grade-sample (1)* is a grade-sample of individuals, using the same specification as Benchmark model (1). *Grade-sample (2)* include a number of extra control variables as GPA, program studied in high school, parental age, birth country, earnings and capital income. *Siblings (1)* using the same specification as OLS (1). *Siblings (2)* is the siblings fixed effect model. W=within, B=between, O=overall.

Table A 6. Estimated college coefficients on risk of unemployment and annual earnings 5 years subsequent to graduation, men

	Benchmark model		Grade-sample		Siblings		Risk of
	(1)	(2)	(1)	(2)	(1)	(2)	Unempl.
Umeå Univ.*	-0.052**	-0.051**	-0.045**	-0.038**	-0.050**	-0.047	0.252**
	(0.005)	(0.005)	(0.009)	(0.009)	(0.016)	(0.027)	(0.018)
Luleå Univ. of Tech.	0.000	0.032**	0.004	0.012	0.009	-0.009	0.204**
	(0.005)	(0.005)	(0.009)	(0.009)	(0.015)	(0.032)	(0.024)
Mid Sweden Univ.	-0.069**	-0.056**	-0.058**	-0.042**	-0.060**	-0.044	0.245**
	(0.006)	(0.006)	(0.010)	(0.010)	(0.023)	(0.037)	(0.026)
Uppsala Univ.*	-0.010*	-0.021**	-0.054**	-0.055**	-0.028*	-0.037	-0.189
	(0.005)	(0.005)	(0.009)	(0.009)	(0.013)	(0.019)	(0.015)**
Univ. Of Gävle	-0.058**	-0.020*	-0.022	-0.013	-0.027	-0.062	0.199**
	(0.009)	(0.009)	(0.014)	(0.014)	(0.032)	(0.062)	(0.041)
Dalarna Univ. College	-0.029**	-0.011	-0.004	0.005	0.002	-0.020	0.106**
	(0.008)	(0.008)	(0.012)	(0.012)	(0.038)	(0.062)	(0.038)
Mälardalen Univ.	0.003	0.011	0.035**	0.037**	0.028	0.044	0.030
	(0.008)	(0.008)	(0.012)	(0.012)	(0.028)	(0.050)	(0.036)
Örebro Univ.	-0.052**	-0.045**	-0.018	-0.010	-0.066*	-0.104**	0.176**
	(0.007)	(0.007)	(0.012)	(0.012)	(0.027)	(0.038)	(0.027)
Stockholm Univ.*	-0.023**	-0.031**	-0.016	-0.015	-0.054**	-0.074**	-0.172**
	(0.006)	(0.006)	(0.014)	(0.013)	(0.020)	(0.024)	(0.018)
Royal Inst. of Tech.	0.052**	0.045**	0.051**	0.048**	0.056**	0.032	-0.386**
	(0.005)	(0.005)	(0.008)	(0.008)	(0.014)	(0.023)	(0.020)
Linköping Univ.	0.061**	0.062**	0.031**	0.025**	0.067**	0.067**	-0.204**
	(0.004)	(0.004)	(0.007)	(0.007)	(0.013)	(0.021)	(0.017)
Jönköping Univ.	-0.033**	-0.069**	-0.014	-0.012	-0.025	-0.037	0.127**
	(0.008)	(0.009)	(0.012)	(0.012)	(0.023)	(0.045)	(0.038)
Univ. of Gothenburg*	0.002	-0.011*	-0.002	-0.006	-0.002	-0.009	0.079**
	(0.005)	(0.005)	(0.011)	(0.010)	(0.014)	(0.022)	(0.016)
Chalmers Univ. of Tech.	0.048**	0.036**	0.031**	0.017*	0.065**	0.022	-0.157**
	(0.004)	(0.004)	(0.007)	(0.007)	(0.012)	(0.023)	(0.018)
Karlstad Univ.	-0.012*	-0.003	-0.009	-0.005	-0.006	-0.076*	0.235**
	(0.006)	(0.006)	(0.010)	(0.010)	(0.022)	(0.038)	(0.028)
Univ. of Skövde	0.027*	0.013	0.057**	0.056**	0.024	0.010	0.011
	(0.011)	(0.011)	(0.017)	(0.017)	(0.029)	(0.058)	(0.048)
Univ. College of Borås	-0.106**	-0.118**	-0.024	-0.015	-0.151**	-0.059	0.315**
	(0.011)	(0.011)	(0.014)	(0.014)	(0.043)	(0.071)	(0.043)
Halmstad Univ.	-0.026**	-0.037**	-0.015	-0.009	-0.032	0.048	0.309**
	(0.009)	(0.009)	(0.013)	(0.013)	(0.026)	(0.052)	(0.041)
Univ. of Kalmar	-0.009	-0.008	0.034**	0.043**	0.010	0.069	0.240**
	(0.008)	(0.008)	(0.013)	(0.013)	(0.021)	(0.049)	(0.034)
Växjö Univ.	-0.009	-0.033**	-0.013	-0.006	0.001	0.031	0.146**
	(0.007)	(0.007)	(0.011)	(0.011)	(0.022)	(0.041)	(0.028)
Kristianstad Univ.	-0.053**	-0.035**	-0.021	-0.015	-0.062	-0.101	0.275**
	(0.010)	(0.010)	(0.015)	(0.015)	(0.044)	(0.072)	(0.047)
Blekinge Inst. of Tech	-0.011	-0.004	0.014	0.028	-0.025	0.003	0.162**
	(0.012)	(0.012)	(0.016)	(0.015)	(0.033)	(0.072)	(0.052)
Univ. West	-0.008	-0.020	-0.001	0.004	-0.040	-0.048	0.205**
	(0.013)	(0.013)	(0.018)	(0.018)	(0.038)	(0.094)	(0.057)
Malmö Univ.	0.002	0.010	0.004	0.008	0.080	0.196	0.169**
	(0.016)	(0.016)	(0.021)	(0.021)	(0.055)	(0.112)	(0.073)
Lund Univ.*	0.033**	0.042**	0.031**	0.025**	0.037**	0.064**	-0.070**
	(0.003)	(0.003)	(0.006)	(0.006)	(0.009)	(0.013)	(0.009)

Control set 1 (Age, age sq, region of birth, graduation year and semester, field and level of education, parental level of education)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control set 2 (GPA, program in high school, parental; age, county of birth, earnings and capital inc)				Yes			
Observations	74214	74214	22872	22872	8260	8260 (3972)	84177
R-squared	0.25	0.26	0.25	0.27	0.25	W:0.19 B:0.30 O:0.25	0.06

Note: Differentials are expressed as the deviation from the (college-share weighted) mean. Standard errors are reported in parentheses and are calculated as described in Haisken-DeNew and Schmidt (1997). *Benchmark model (1)* is the full sample, using county of birth as labor market control. *Benchmark model (2)* is the full sample, using local unemployment rates as labor market control. *Grade-sample (1)* is a grade-sample of individuals, using the same specification as Benchmark model (1). *Grade-sample (2)* include a number of extra control variables as GPA, program studied in high school, parental age, birth country, earnings and capital income. *Siblings (1)* using the same specification as OLS (1). *Siblings (2)* is the siblings fixed effect model. W=within, B=between, O=overall.

Table A 7. Field specific college coefficients on annual earnings 5 years subsequent to graduation, women

	Teaching	**Social Science**	**Technology**	**Health Care**	**Interactions**
Umeå Univ.*	-0.020**	-0.058**	0.015	-0.020**	-0.022**
	(0.005)	(0.011)	(0.032)	(0.008)	(0.004)
Luleå Univ. of Tech.	-0.036**	-0.029	-0.030	0.026	-0.020**
	(0.007)	(0.018)	(0.022)	(0.049)	(0.006)
Mid Sweden Univ.	-0.054**	-0.054**	-0.019	0.007	-0.018**
	(0.007)	(0.013)	(0.032)	(0.009)	(0.005)
Uppsala Univ.*	-0.006	-0.009	-0.017	0.061**	0.020**
	(0.007)	(0.008)	(0.028)	(0.008)	(0.004)
Univ. Of Gävle	-0.030**	-0.049	0.035	0.034	-0.017**
	(0.007)	(0.034)	(0.029)	(0.021)	(0.006)
Dalarna Univ. College	-0.036**	-0.086**	-0.012	-0.052	-0.031**
	(0.009)	(0.019)	(0.030)	(0.043)	(0.008)
Mälardalen Univ.	-0.044**	0.014	0.055*	-0.003	0.003
	(0.009)	(0.020)	(0.028)	(0.014)	(0.007)
Örebro Univ.	-0.021**	-0.023	-0.007	-0.037**	-0.015**
	(0.008)	(0.013)	(0.052)	(0.008)	(0.005)
Stockholm Univ.*	-0.020**	-0.007	-	-0.018	0.013**
	(0.006)	(0.008)		(0.010)	(0.005)
Royal Inst. of Tech.	-	-	0.041*	-	0.028*
			(0.019)		(0.012)
Linköping Univ.	-0.020**	0.025*	0.113**	-0.009	0.017**
	(0.006)	(0.012)	(0.022)	(0.012)	(0.004)
Jönköping Univ.	-0.048**	-0.035*	-0.007	-	-0.030**
	(0.006)	(0.017)	(0.032)		(0.006)
Univ. of Gothenburg*	-0.004	-0.007	-0.038	-0.004	0.003
	(0.004)	(0.008)	(0.126)	(0.007)	(0.003)

Chalmers Univ. of Tech.	-	0.354**	0.005	-	0.002
		(0.090)	(0.019)		(0.012)
Karlstad Univ.	-0.035**	-0.020	-0.011	-0.018	-0.013**
	(0.006)	(0.014)	(0.036)	(0.027)	(0.005)
Univ. of Skövde	-	-0.076**	-0.082	-0.023	-0.033*
		(0.023)	(0.051)	(0.030)	(0.015)
Univ. College of Borås	-0.106**	-0.226**	-0.042	0.004	-0.132**
	(0.013)	(0.012)	(0.026)	(0.035)	(0.008)
Halmstad Univ.	-0.038**	-0.007	0.050	-0.022	-0.015
	(0.009)	(0.021)	(0.035)	(0.018)	(0.008)
Univ. of Kalmar	-0.046**	-0.100**	0.015	-0.022	-0.031**
	(0.008)	(0.023)	(0.039)	(0.028)	(0.007)
Växjö Univ.	-0.030**	0.017	-0.027	0.038	0.008
	(0.007)	(0.012)	(0.031)	(0.036)	(0.006)
Kristianstad Univ.	-0.042**	-0.094**	0.037	0.006	-0.024**
	(0.007)	(0.034)	(0.046)	(0.024)	(0.006)
Blekinge Inst. of Tech	-	0.007	-0.017	-0.033	-0.034
		(0.035)	(0.040)	(0.046)	(0.019)
Univ. West	-0.073**	-0.085*	-0.020	-	-0.043**
	(0.013)	(0.034)	(0.040)		(0.013)
Malmö Univ.	0.005	-	-0.023	-0.003	0.011
	(0.012)		(0.041)	(0.024)	(0.011)
Lund Univ.*	0.004	0.013	-0.026	-0.003	0.012**
	(0.003)	(0.007)	(0.041)	(0.004)	(0.002)
Control set 1 (Age, age sq, region of birth, graduation year and semester, level of education, parental level of education)	Yes	Yes	Yes	Yes	Yes
Observations	37107	22013	7362	17672	92998
R-squared	0.33	0.11	0.13	0.21	0.29

Note: Differentials are expressed as the deviation from the (college-share weighted) mean. Standard errors are reported in parentheses and are calculated as described in Haisken-DeNew and Schmidt (1997). In specification "interaction" all control variables are interacted with field of education.

Table A 8. Field specific college coefficients on annual earnings 5 years subsequent to graduation, men

	Teaching	**Social Science**	**Technology**	**Health Care**	**Interactions**
Umeå Univ.*	-0.041**	-0.103	-0.054**	-0.039**	-0.053**
	(0.009)	(0.011)	(0.013)	(0.011)	(0.005)
Luleå Univ. of Tech.	-0.049**	-0.079**	-0.006	0.099**	-0.009
	(0.011)	(0.021)	(0.010)	(0.019)	(0.006)
Mid Sweden Univ.	-0.073**	-0.096**	-0.067**	0.016	-0.049**
	(0.015)	(0.014)	(0.012)	(0.017)	(0.006)
Uppsala Univ.*	0.011	-0.036**	-0.031**	-0.036**	-0.013**
	(0.012)	(0.008)	(0.012)	(0.012)	(0.005)
Univ. Of Gävle	-0.050**	-0.122**	-0.037*	0.117**	-0.049**
	(0.013)	(0.028)	(0.015)	(0.040)	(0.009)
Dalarna Univ. College	-0.044**	-0.129**	-0.013	0.190**	-0.022**
	(0.016)	(0.025)	(0.012)	(0.049)	(0.008)
Mälardalen Univ.	-0.148**	-0.045*	0.016	0.138**	0.010
	(0.022)	(0.022)	(0.012)	(0.022)	(0.008)

Örebro Univ.	-0.027*	-0.109**	-0.032*	-0.018	-0.037**
	(0.012)	(0.014)	(0.014)	(0.017)	(0.007)
Stockholm Univ.*	0.120*	-0.035**	-	-0.061**	-0.020**
	(0.065)	(0.009)		(0.023)	(0.007)
Royal Inst. of Tech.	-	-	0.053**	-	0.056**
			(0.009)		(0.005)
Linköping Univ.	0.001	0.002	0.077**	0.014	0.055**
	(0.010)	(0.013)	(0.009)	(0.014)	(0.004)
Jönköping Univ.	-0.047**	-0.040*	-0.054**	-	-0.031**
	(0.014)	(0.017)	(0.014)		(0.008)
Univ. of Gothenburg*	0.010	0.019*	0.059	-0.054**	0.004
	(0.009)	(0.009)	(0.064)	(0.011)	(0.005)
Chalmers Univ. of Tech.	-	0.375**	0.024**	-	0.038**
		(0.038)	(0.008)		(0.005)
Karlstad Univ.	-0.052**	-0.036*	-0.034**	0.117**	-0.015**
	(0.011)	(0.014)	(0.012)	(0.046)	(0.006)
Univ. of Skövde	0.124**	-0.115**	0.009	0.058	0.005
	(0.011)	(0.023)	(0.018)	(0.055)	(0.011)
Univ. College of Borås	-0.162**	-0.199**	-0.046**	0.064	-0.081**
	(0.039)	(0.021)	(0.014)	(0.042)	(0.011)
Halmstad Univ.	-0.142**	-0.059*	0.000	0.073	-0.018*
	(0.035)	(0.025)	(0.012)	(0.047)	(0.009)
Univ. of Kalmar	-0.050**	-0.035	0.000	0.012	0.002
	(0.017)	(0.037)	(0.012)	(0.052)	(0.008)
Växjö Univ.	-0.021	-0.034**	-0.061**	0.161**	-0.013
	(0.013)	(0.013)	(0.013)	(0.050)	(0.007)
Kristianstad Univ.	-0.045**	-0.128**	-0.007	0.115**	-0.034**
	(0.013)	(0.034)	(0.018)	(0.035)	(0.010)
Blekinge Inst. of Tech	-	0.027	-0.030	0.006	-0.012
		(0.029)	(0.016)	(0.060)	(0.012)
Univ. West	-0.099**	-0.112**	-0.019	-	-0.020
	(0.040)	(0.038)	(0.016)		(0.013)
Malmö Univ.	-0.026	-	-0.019	-0.005	-0.017
	(0.020)		(0.032)	(0.054)	(0.016)
Lund Univ.*	0.029**	0.070**	0.003	-0.022**	0.027**
	(0.007)	(0.006)	(0.008)	(0.006)	(0.003)
Control set 1 (Age, age sq, region of birth, graduation year and semester, level of education, parental level of education)	Yes	Yes	Yes	Yes	Yes
Observations	9879	19085	30129	5674	74214
R-squared	0.30	0.12	0.24	0.44	0.28

Note: Differentials are expressed as the deviation from the (college-share weighted) mean differential. Standard errors are reported in parentheses and are calculated as described in Haisken-DeNew and Schmidt (1997). In specification "interaction" all control variables are interacted with field of education.

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