

Student employment: Social differentials and field-specific developments in higher education

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Abstract

In this article, we examine social origin differences in employment patterns across different stages of higher education and compare these differences between vocational and academic fields of study. Using data from a large-scale German student survey, we study the development of inequality, according to social origins, in student employment from first-year students through graduating students. We show that inequality in job quality exists and is partly attributable to the need for students from lower social origins to work to finance their studies. We hypothesise that initial inequalities decrease as students progress through higher education. While we find evidence for this hypothesis, we also show in multivariate models that the reduction of inequality in the student labour market is explained by prior differences between social origin groups.

Keywords:

higher education, social origin, Germany, term time employment, educational inequality

Student employment: Social differentials and field-specific developments in higher education

Introduction

A large body of literature on student employment has investigated both the conditions of employment among higher education students and its effects on academic progression and labor market success (for a review see e.g. Riggert et al 2006). Many studies point out that the interference of work with academic achievement and progression depends on the quality of jobs as well as on the quantity of the working hours. However, there is yet only scarce empirical investigation on the type of work of different students. Existing studies for Europe and the US consistently show differences by social origins. On average, students from less privileged background work more hours and/or work in jobs of lower quality than students from higher origins (Hauschildt et al 2015: 95ff; Roksa and Velez, 2010; Roksa, 2010; Hall, 2010; Lucas and Ralston, 1997; Bozick, 2007; Weiss & Roksa, 2016). In this article we contribute to the existing literature by examining inequality in several dimensions of student's employment, i.e. working hours, wages, whether the jobs fits to one's studies and if work is on-campus. We study the gap between students whose parents work in managerial positions, as self-employed with large firms or high-income professionals on one side and the children of all other employees on the other side. In addition, we examine whether and in what respect the characteristics of student employment changes by comparing students with different study progress.

We argue that student's employment may improve with progress in higher education since qualifications acquired in by university studies facilitate access to qualified jobs. Students from lower economic backgrounds – who have to work in any (unskilled) job at the beginning of their studies due to financial necessity – may benefit more from this development of human capital and later secure

‘good’ jobs that offer training and pay better. Thus, social differentials in term-time employment that have been observed in previous studies for the entire student body may vary between students with different progress in higher education. If especially the jobs of students from lower social origins improve with progress in higher education, social differences in student employment may decrease with duration of enrolment.

The improvement of job quality for advanced students may depend on the kind of skills that students acquire during higher education. While applied fields place a stronger emphasis on acquiring vocational human capital, general fields can be hypothesized to strengthen soft skills or just signal trainability via the attainment of a degree. Hence, particularly students in vocationally oriented fields may acquire qualifications during higher education easing access to better student jobs compared with students in the arts and sciences.

In the following section, we discuss our expectations about social inequality as related to student job quality in more detail, both theoretically and empirically, guided by the following questions: *Do students from different social origins work in jobs of different quality characteristics? Are social inequalities in job quality attributable to different motivations to engage in work? Do social inequalities in job quality decrease as students progress with their studies, particularly in vocationally oriented study programmes?*

Next, we discuss potential explanations regarding why and how students’ job characteristics vary with their durations of study, social origins and fields of study. For our empirical analysis, we use Germany’s ‘Social Survey of Students,’ the largest nationwide survey of students. We present empirical results on the development of job quality according to parental social class and field of study, first in a non-parametric setting and then using multivariate models. Finally, we empirically examine our theoretical assumptions about students’ motivations to work and evaluate what rationales and motives explain the observed inequalities.

Work between financial necessity and on-the-job training

Previous research has shown that social origins correlate with the extent and type of student employment (Bozick, 2007; Demeulemeester and Rochat, 2000; Callender, 2008; Roksa and Velez, 2010). Going beyond these findings, we discuss whether and when social origin differences in job characteristics change with progress in higher education. We propose three main hypotheses: a) that job quality improves over the period studied; b) that job characteristics vary across social origins; and c) that the social origin gap in job quality decreases most strongly over time in vocationally oriented fields of study.

Low- and high-quality jobs

Inequality in term-time work has at least two facets, and both the quality and quantity of work must be considered when describing inequality in students' employment situations (Roksa and Velez, 2010). However, most existing empirical research on student employment and its consequences examines work intensity (Curtis and Shani, 2002; Callender, 2008; Moulin et al., 2013; Hovdhaugen, 2015; Body et al., 2014; Theune, 2015). Few authors also consider the quality of the job by broadly distinguishing between on-campus and off-campus employment (e.g., Behr and Theune, 2014, Wenz and Yu, 2010) or the relation of the job to the student's field of study (Robert and Saar, 2012; Geel and Backes-Gellner, 2012).

In order to establish criteria for assessing job quality, we consider differences in job costs and the types of returns they provide. The most relevant individual cost of working is time that could otherwise be used for studying or for leisure activities. For a student who works more than a certain number of hours, the probability of conflicts with academic work strongly increases. Hence, we consider jobs with long working hours to be of 'low quality' with regard to educational success. Such a double burden might be particularly detrimental for students' performance during the later phases

of their studies when preparing for final exams, and hence we expect advanced students to avoid long working hours.

As another facet of job quality, we distinguish (immediate) monetary returns and non-monetary (long-term) returns, such as skills developed on the job or social networks with co-workers (for other non-financial benefits of work, see Curtis and Shani, 2002; Watts and Pickering, 2000). We consider jobs providing additional benefits that may be valuable when entering the labour market to be better than other jobs.

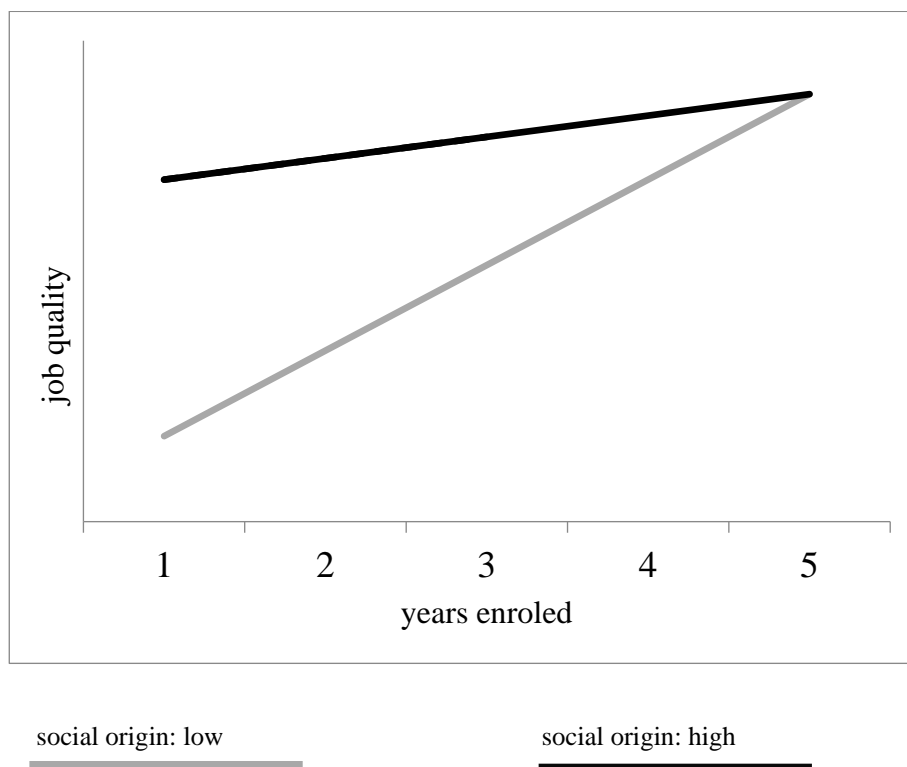
Regarding the accessibility of jobs, we assume no difficulties for students wanting to enter unskilled employment. In contrast, access to higher quality jobs is constrained. We hypothesise that students will increasingly obtain access to high-quality jobs over the course of their studies because employers value the skills they have acquired during higher education (van der Velden and Humburg, 2014). Consequently, we expect *an increase in students' job quality over time (hypothesis 1)*.

Social origin gaps in student employment and job quality

In this paper, we extend previous findings regarding social inequalities in student employment by focusing on the potential of students educational experience for overcoming social origin differences. We argue that social origin effects in the quality of jobs diminish with each semester of higher education, as Figure 1 illustrates. The horizontal axis denotes the duration of enrolment; the vertical axis denotes job quality, with higher values indicating better jobs. We assume that students from higher socio-economic backgrounds can choose whether they want to work because they experience lower financial pressure. This choice increases their 'reservation returns' (monetary or non-monetary). Thus, students from higher social origins refrain from working as they study if good jobs are not available. Consequently, if they work, students from higher classes are more likely than students from lower social origins to have advantageous, higher-quality jobs. Moreover, students from more privileged backgrounds obtain access to good jobs because of their (on average) better

scholastic performance, social and cultural capital, or direct parental support and networks. In contrast, we assume that for students from less privileged origins, financial needs are an important rationale for working. Therefore, these students may accept any job they can acquire regardless of its quality. Thus, soon after enrolment, social differentials are expected to be high. During higher education, vocational skills are acquired, and employability for high-quality jobs improves regardless of origins. This improvement compensates for the initial disadvantages of students from lower social origins and the social inequality in term-time employment decreases.

Figure 1. Illustration of hypotheses



To sum up, we expect *social origin differences in term-time employment to be highest among first-year students and to decrease over the course of study (Hypothesis 2a)*. Furthermore, as an indirect

implication of our reasoning above, we expect that *social differentials in job quality is (partly) explained by different motivations to engage in employment (Hypothesis 2b)*. We test this assumption by employing a decomposition analysis following the main analysis of social inequality and its changes over time.

Field of study, job quality and social inequality

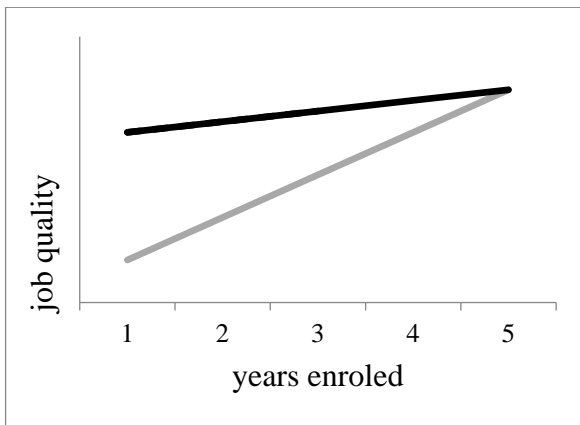
Fields of study differ in the qualifications they provide to students (e.g., van de Werfhorst, 2002; Gerber and Cheung, 2008). Students in occupation-specific fields can be expected to acquire more readily applicable skills than students in the arts and sciences (Brint et al., 2005; Klein, 2011). Especially among students who may not stay with an employer for a long time, the lower training costs of occupation-specific education should pay off. Hence, student jobs in the arts and sciences should be of lower quality than jobs offered to students from vocationally oriented fields.

We use this difference in occupation-specific skills to test whether specific human capital, attained through higher education, improves employability and thus contributes to an equalisation between students from higher and lower backgrounds over time. If this is the case, the equalisation among students in occupation-specific fields of study should proceed faster because qualifications developed through education enable students from lower social origins to catch up to their peers from higher social backgrounds. In contrast, in the arts and sciences, employability depends more on strong signals of trainability, acquired through the attainment of a degree. On-the-job training will be necessary, which is a risky investment for employers hiring students who may not have a long employment history with them. Moreover, in a job that does not require specific training, other ‘soft’ traits may be important (Farkas, 2003), and these traits may not improve considerably through education. Assuming that students with more privileged backgrounds are better equipped with these soft skills, we expect stable and high inequality among jobs in arts and sciences programmes. Figure 2 illustrates our hypotheses: regarding differences among fields of study, we hypothesise that *working*

students in the ‘arts and sciences’ have lower job quality than students in occupation-specific fields¹ (hypothesis 3a). Social differentials in job quality are expected to strongly decrease in occupation-specific fields, whereas for students in the arts and sciences, differences among social origins remain almost stable (hypothesis 3b).

Figure 2. Illustration of study-field specific hypotheses

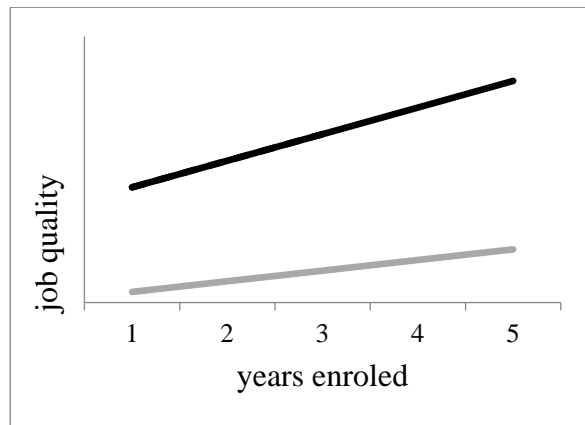
vocational fields of study



social origin: low



arts and sciences



social origin: high



¹ Additionally, we assume that job quality increases somewhat for all students.

Student employment in Germany

In Germany, enrolment in higher education is usually considered to be a full-time commitment. In 2008, only 4.5 percent of all students in study programmes offered in universities and universities of applied sciences (equivalent to the International Standard Classification of Education ISCED 5A-level) were enrolled part-time (Statistische Ämter des Bundes und der Länder, 2010:48). Hence, expected full-time participation in higher education means that if any - part-time - job must fit within a student's academic schedule.

In 2000 13 percent of all students in tertiary education received public financial support via the so-called *Bafög*-system (named after the German Federal Training Assistance Act) (BMBF, 2012: 12). Funding is provided after means-testing and usually has both a studentship and a loan component. The student's own income may partly reduce his *Bafög*-receipt. Furthermore, recipients must report regularly on the progress of their studies. Funding ends after the standard duration of study (6 to 9 semesters). In 2000, an average of EUR 326/month were paid per student (BMBF, 2012: 30). Hence, public financial support can be expected to reduce student employment due to means testing and the requirement to prove academic progress. However, as both the coverage and the average amount are not very high, students may still work (in addition to the *Bafög*-receipt) to cover their living expenses. Moreover, if students exceed the maximum time for which they are allowed to receive funding, their participation in paid employment may increase.

Students are often employed in jobs with reduced social security contributions ('marginal jobs'). Reduced social security contributions apply if the monthly wage is below a certain threshold, e.g. in 2000 up to 325 Euro, or if work intensity is low, e.g. up to 15 h per week in 2000. If employment exceeds these thresholds social security contributions increase sharply. In addition, there are particular regulations for students compared to other employees in marginal jobs. For full-time students working less than 20 hours per week during term-time, social security contributions are

significantly reduced or even waived (*Werkstudentenprivileg*).² Hence, incentives are high to adjust working hours to these thresholds, but in cases of financial necessity students still may decide to work more hours e.g. by exploiting the exceptions or just by paying social security contributions for the job.

Data and methods

Data

We analyse data from 16th German Student Survey from the year 2000 ('16. Sozialerhebung', Schnitzer et al., 2001).³ This cross-sectional dataset is conducted by '*Deutsches Zentrum für Hochschul- und Wissenschaftsforschung*' (DZWH, formerly HIS *Hochschul-Informationssystem*) on behalf of the '*Deutsches Studentenwerk*' and funded by the German Federal Ministry of Education and Research. The reference period of this dataset reaches back to the period before the Bologna reforms which introduced a Bachelor/Master system to the German tertiary education sector. Using data from the pre-Bologna period has some advantages for studying our research question on social inequality in student's employment and its change over the course of study. First and foremost, in order to test our theoretical mechanism, we prefer a setting in which students' educational careers are

² See verdict of the Federal Social Security Court (Bundessozialgericht) 11.11.2003 - B 12 KR 24/03 R. There are some exceptions, e.g. working mainly in the evening or weekends. During the semester break students are allowed to work more than 20 hours per week, however, at a maximum of 26 week per year.

³ More recent waves were unsuitable for our research question because detailed questions regarding students' job quality were not asked. Moreover, we favor the 2000 data compared to later surveys (e.g. in 2006 or 2009) since two major structural changes in higher education occurred between 2000 and 2010. First, the introduction of the Bologna reforms in Germany began in 1999, gradually replacing old diploma programs over a longer period with Bachelor/Masters programs and resulting in greater heterogeneity of students in various programs with different demands and durations. However, until summer term 2000 only 183 study programs (123 Bachelor, 60 Master) had been introduced resp. changed to the new system, (estimated) 2 percent of all study programs offered (HRK 2011:7). On the level of individual students, the replacement took long and neared completion only in 2015, and the share of students in the new programs in 2000 was negligibly small (cf. Statistisches Bundesamt, 2016, p. 10). Second, several federal states (*Bundesländer*) introduced and abolished tuition fees in different years, see Baier et al (2012: 231) for an overview, which may have affected students' security about their financial situation. In the year 2000, there were no tuition fees yet in Germany. Third, with the introduction of the Bachelor-/Master scheme a growing number of students interrupted their educational career and gathered work experience, which leads to more heterogeneity in Master programs regarding work experience and previous labor market activity.

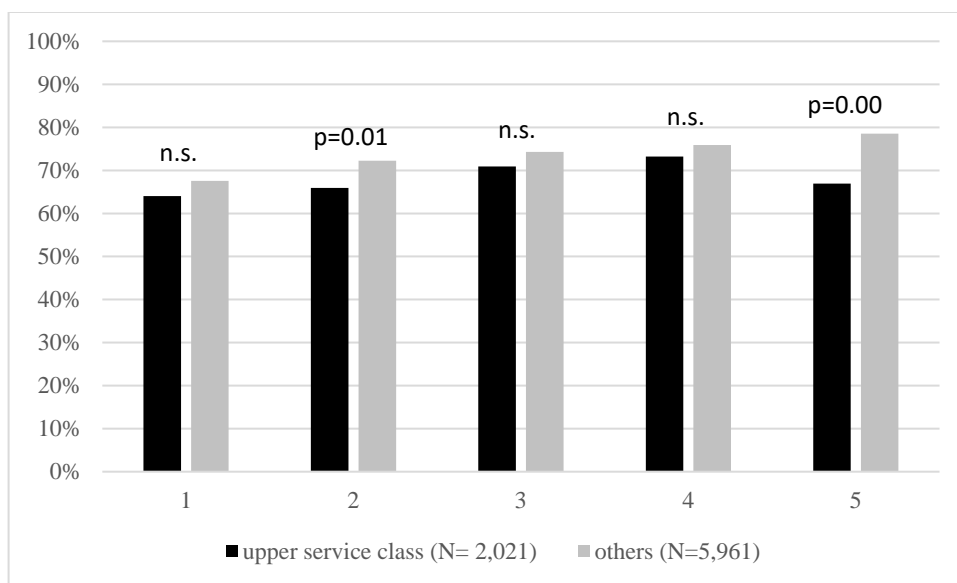
rarely interrupted and they usually have none or at least not much previous work experience. The rather stable educational careers in the pre-Bologna era in Germany (cf. Weiss, 2013, 59f.) are thus ideal for our analyses. In the most recent cohorts after the reform, when BA- and MA-students already accounted for a large proportion of the enrolment in higher education, we have to expect much more complex patterns of educational attainment, i.e. more individualistic educational careers. Second, during the transitional phase of the Bologna reform, study programs were very heterogeneous and our selection of fields of studies would be more difficult to operationalize. Third, from the practical side we argue that the dataset from the year 2000 is still unparalleled in the quality of questions about student employment – in particular the overlap of the content between work and education – and in its sample size.

All universities in Germany were asked to draw a random sample from their internal address pool and send out these questionnaires. While 269 out of 303 (89 percent) universities took part, the net response rate (27 percent of the gross sample of individuals) is low, but similar to the value of other studies in the German context. Weights provided by the data-producer are applied to correct for selective non-response relying on gender, type of university and field of study. The survey contains information on students' economic and social characteristics, including various employment indicators and basic information regarding parental background. This information allows us to examine variations in student employment from first-year students to students in their final years. The full sample size is 12,573 students and includes only students with German citizenship. We excluded students who already hold a vocational or academic degree and students who study in one of the rare part-time programmes (*berufsbegleitendes Studium*). Students who exceeded a five-year duration of study were also excluded. We excluded this group due to the fact the remaining group of

students who study longer than five years is extremely selective, as many students graduate on time⁴. This leaves us with 7,982 respondents.

Figure 3 depicts the share of employed students. Students with upper service class parents in high occupational positions tend to indicate less often that they were employed during the 2000 academic term and/or the preceding break than those from other backgrounds. However, the difference is only significant for students who are enrolled in their second ($p = .01$) and their fifth years ($p = .000$). In the following analyses of job characteristics, we only included respondents who have been employed, leaving us with sample sizes between 4,910 and 5,101 depending on the dependent variable.

Figure 3: Share of students employed by social origin and years enrolled



Source: 16th German Student Survey; weighted; N = 7,982.
n.s.: not statistically significant at least the 0.05-level, z-test; p: p-value, z-test.

⁴ Many students leave higher education after the fifth year as graduates, and thus we have to expect extremely selective departure from our sample. E.g. in 2003, the average study duration in long university programs was 12 semesters within the program (Statistisches Bundesamt, 2003).

Operationalisation of central concepts

We operationalise *job quality* in four ways. First, we use *working hours*; we defined a binary variable coded '0' for working more than 20 hours/ week and '1' for working less than 20 hours/week.⁵ We set this threshold on the one hand according to the limitation for exemptions from full contributions to the social security system as stated in the respective verdict of the Federal Social Security Court (see above, section 'Student employment in Germany'). If students work less than 20 hours, social security deductions are rather low, hence incentives are high to remain below this threshold if possible. In addition, we expect that work will more severely interfere with full time studies if it exceeds a certain number of hours. While the exact threshold is to some extent arbitrary, previous research has confirmed this assumption of conflict between long working hours and study demands (Body, Bonnal, & Giret, 2014; Hovdhaugen, 2015; Body et al. 2014). Second, we refer to hourly *wage* (in Euros). Third, we examine whether jobs are *related to students' field of study*. Previous research has shown that field-related work actually improves labour market outcomes after graduation (Weiss et al., 2014). We create an indicator variable that distinguishes between students who identified their job as 'not at all related to their field of study' and at least 'somewhat related'. Fourth, we examine work as a *research assistant* on campus, including both teaching and research assistants, assuming that these particular jobs improve students' field-related skills and networks.⁶

Our main independent variable, *social origin*, is operationalised as parents' highest occupational position. We compare students with parents in high occupational positions (e.g. executives, higher civil servants and judges, proprietors with a high number of employees, and professionals) with students whose parents' highest occupational position is lower. This variable was

⁵ We assign code ,0' for working *more* than 20 hours and ,1' for working *less* 20 hours in order to improve comparability of our findings across the different indicators indicating ,improvement' of job quality over time.

⁶ We do not consider research assistants when analyzing field-specific inequality because the applicability of skills developed during higher education should not differ between occupation-oriented fields and arts and sciences.

created based on the German ‘Stellung im Betrieb’, which is an official classification of occupational positions that captures, besides the social security status of the employee, hierarchical standing in the workplace and skill requirements of the job and the firm size of self-employed, farmers and entrepreneurs. The questionnaire, which is a revised form of the official classification, is documented in the Appendix. About one quarter of all students in our sample belong to the group with parents in these ‘elite’ positions (i.e. upper service class positions). For our analysis by field of study, we distinguish between occupation-oriented fields of study and non-occupation-specific fields, following the classification of Brint et al. (2005).

We further control for the student’s intended type of degree (‘university diploma’, ‘diploma at a university of applied sciences’, ‘magister’, ‘state examination’, and ‘church degree’⁷), whether the university is located in a city with more than 500,000 inhabitants, and fields of study (‘humanities’, ‘natural sciences’, ‘social sciences’, ‘engineering’, ‘pedagogy’, ‘medicine’, ‘teaching’, and ‘law and economics’). Because the student’s financial situation is a cornerstone of our theoretical argument, we control for receipt of federal student aid (*BAföG*; ‘not eligible/parental income too high’, ‘not eligible/other reasons’, ‘eligible independently from parental income’ and ‘regularly eligible’). Furthermore, we include a dichotomous variable in our models to indicate whether housing costs accrue to correct for larger rates of students (in certain subgroups) living in the parental household.

To test our hypothesis that social origin effects are explained by students’ different motivations to work, we draw on three direct measures contained in the dataset: students’ own assessment of whether they were working ‘due to financial necessity’, ‘in order to gain work experience’ or ‘to build up labour market-related networks’. These variables ranged from 0, ‘does not apply at all’, to 4, ‘fully applies’.

⁷ For the analyses by field of study, we collapse university diploma and church degree into one category.

Descriptive statistics of all variables are given in Table A1 in the appendix.

Data Analysis

To descriptively explore our hypotheses on inequality in student employment in a non-parametric setting, we fit local polynomial regression lines to the degree 0, which equals local mean smoothing, for the indicators of job quality over time. We prefer smoothed lines for these plots over the raw means in order to illustrate the more general pattern that we hypothesized in figures 1 and 2. Local mean smoothing on the other hand is very flexible, and can thus well adjust to the data without wiping out too much variation. This has also led us to choose smaller smoothing windows of less than one year for all figures.

For multivariate analyses, we estimate probit models for the dichotomous dependent variables and linear (OLS) models for continuous dependent variables. In probit regressions, interaction effects depend on all covariates included in the model and is therefore likely to vary between observations and cannot be evaluated by simply looking at the regression coefficient. We follow Norton et al. (2004) and estimate the full range of each interaction coefficient (years enrolled * parents' highest occupational status) and its varying statistical significance across all observations.

In an additional analysis we want to identify how much of the social origin differences in the examined job quality dimensions are attributable to class-specific distributions of student employment motivation. To compare different mechanisms with regard to their explanatory power for the group differences, we apply decomposition analysis. We use the Stata implementations of the Blinder-Oaxaca decomposition for linear regression models (Jann, 2008) and Fairlie's extension to logit and probit models (Fairlie, 2005), and decompose coefficients from pooled models over both social origin groups. To make sure that the results do not depend on the reference category chosen, we use a "normalized" effect that averages the effect over all possible reference categories (Yun, 2005). For the models with binary outcomes, we additionally randomize the order of variables over

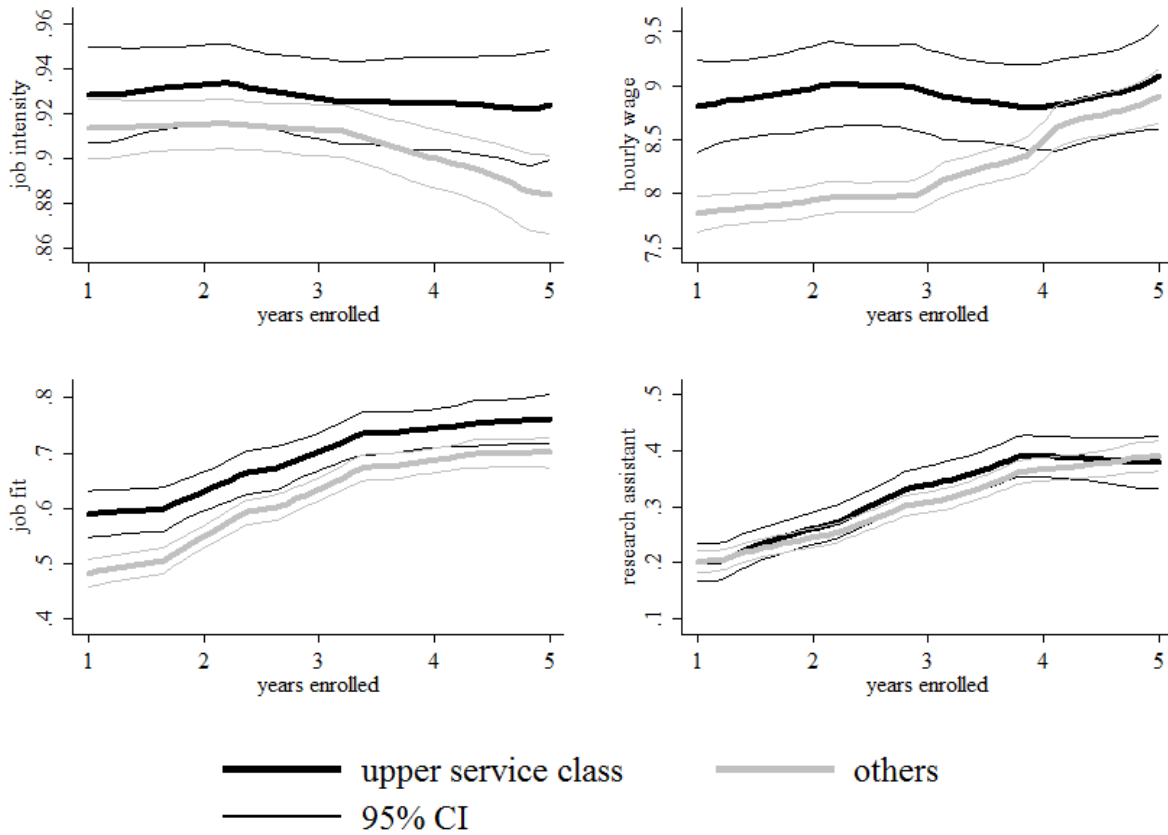
1000 replications to overcome the problem of sensitivity to the ordering of variables due to nonlinearity. We decompose the social origin effects on the different dimensions of job quality into components that are explained and unexplained by the class-specific distributions of student employment motivation.

Empirical results

Social inequalities in job quality: do they exist and do they change with progress in higher education?

Figure 4 presents social inequalities in student job quality over the course of students' education. Inequality in *remuneration* (upper right) most strongly resembles our expectation of a general increase in wages accompanied by decreasing social differentials. Consistent with our hypothesis, students from higher social backgrounds start with higher wages compared to students from lower backgrounds. Figure 4 shows that this initial gap remains rather stable unless students are in the second half of their studies, i.e. the gap decreases considerably after the third year and is insignificant in the final phase of studies. The convergence in wages occurs because of a large wage increase for students from lower classes. We find a similar pattern for the job's *relation to field of study* (lower left). In the first year, students from privileged backgrounds have a considerably higher probability of holding a job that is related to field of study than those from less privileged backgrounds. The probability of a related job increases for all students with the duration of enrolment and the initial social gap, which is significant up to the third year (in the non-parametric model), disappears because students from lower backgrounds catch up.

Figure 4: Non-parametric local polynomial regressions on different indicators of student job quality over the course of study



Source: 16th German Student Survey; weighted; Population: employed students.

Notes: Local polynomial regression (local mean smoothing) with 95% confidence intervals; Epanechnikov-kernel with bandwidth 0.5 ('wage'), 0.8 ('job intensity' and 'research assistant') and 0.6 ('job fit').

Job intensity: working less than 20h/week, 1=yes. (N: 5101)

Hourly wage: € (N: 4970)

Job fit: job related to students' field of study, 1=yes. (N: 5152)

Research assistant: employed as teaching or research assistant by a university or research institute (on campus employment). (N: 5174)

Access to a job as a *research assistant* (lower right) increases with educational experience for both classes, with no significant difference between the two origin groups. Regarding long *working hours*, we do not find a reduction of share of students affected over time; this contrasts with our assumption that students would reduce their working hours in their final semesters in order to devote more time to their coursework. During their first year, all students have a high probability of more than 90 percent to work fewer than 20 hours per week, i.e. only a minority of less than 10 percent of

first year students works with high intensity. Later in their studies, students from lower backgrounds increasingly exceed the 20 hours/week-threshold. However, this divergence does not reach significance.

When we examine the relationship between social origins and job quality in multivariate analyses (see full models in the Appendix, Table A2), including various socio-demographic, financial and study-related variables, we still find that students with parents in high positions have better jobs. They earn higher wages and are more likely to work in a field-related job than their peers from lower origins. There is no significant social inequality seen among students who work long hours or in students' chances of working as a research assistant. We further confirm that the number of years enrolled in higher education has a positive effect on job fit, wages, and obtaining a job as a research assistant but no significant effect on working fewer than 20 hours over the course of one's education.

Regarding the expected convergence of social differentials in job quality over time, Table 1 shows the interaction effects of social origins and years enrolled (see full models in the Appendix, Table A2). The convergence in job quality for wages and job fit observed in the non-parametric analyses in Figure 4 holds true in the multivariate models but the interactions are not statistically significant at conventional levels (marginally significant at the 10% level for wages for a two-sided test). Interpreting the size of the coefficients, students of high social origins earn €1.09 per hour more in their first year, but this gap decreases to €0.29 among students the fourth year. The probability of occupying a field-related job is initially 26 percentage points higher for student from higher social origins. It also increases strongly over time, on average 20 percentage points per year enrolled for the lower social origin group (main effect). The gap between social origins decreases only by 1 percentage point per year. Also in accordance with Figure 4, we find no change in inequality for working hours and working as a research assistant.⁸

⁸ Results for binary outcomes do not differ substantially when estimated using OLS regressions and are available from the authors upon request.

Table 1: Regression results: Effects of social origins and years enrolled on student job quality

	working < 20 hours¹	wage²	job and studies relate¹	research assistant¹
<i>Social origin (Ref: others)</i>				
high occupational position	0.07 (0.16)	1.09** (0.32)	0.26* (0.11)	0.02 (0.12)
no. of years enrolled	-0.03 (0.02)	0.25*** (0.06)	0.20*** (0.02)	0.18*** (0.02)
social origin: high *years enrolled	0.01 (0.01)	-0.20+ (0.10)	-0.01 (0.01)	-0.00 (0.01)
N	5101	4970	5152	5174

Source: 16th German Student Survey; weighted

Notes: *** p <.001, ** p<.01 * p<.05 + p<.1

¹Probit model: interaction effects estimated applying the 'inteff'-command (Norton et al., 2004), robust standard errors in parentheses.

²OLS; robust standard errors in parentheses.

Variables held constant (full model in the Appendix): gender, marital status, intended type of degree, field of study, city, eligibility for means-tested federal studentship (BAföG), housing costs (any).

Do social inequalities vary by field of study?

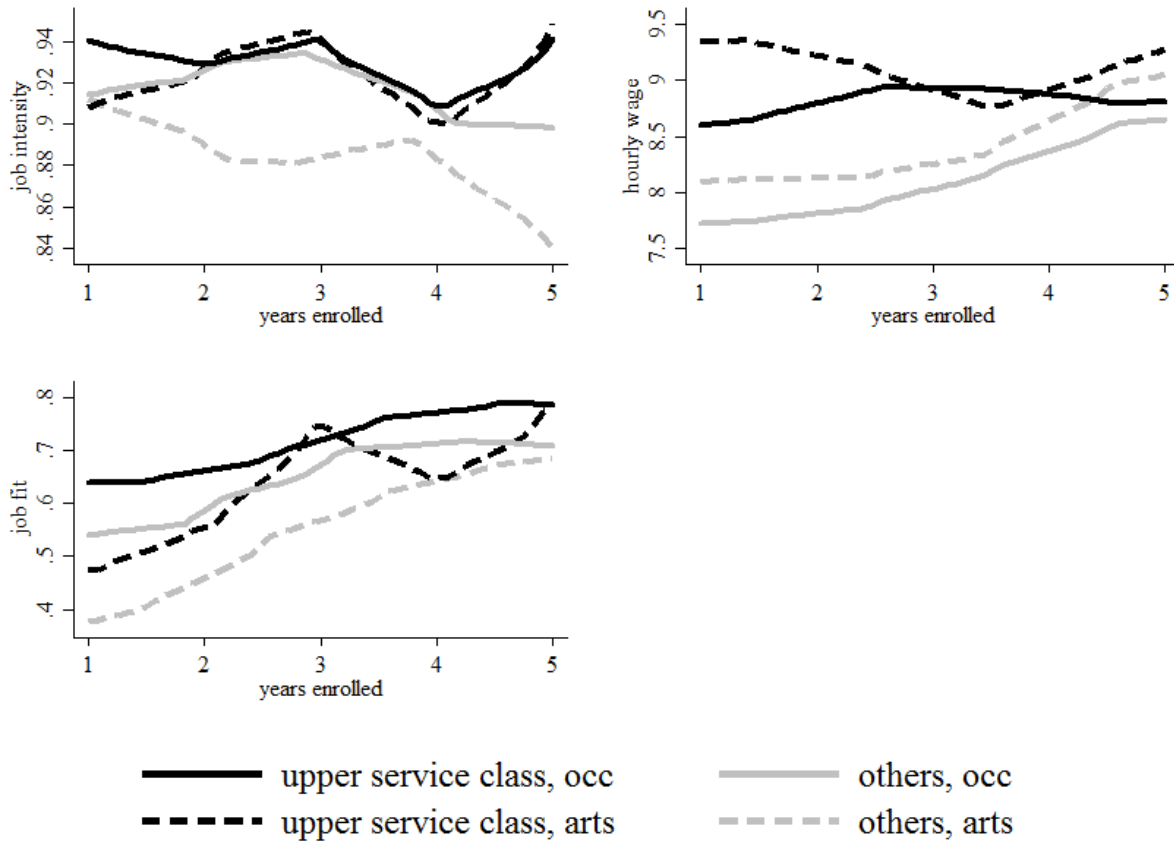
To examine differences between vocational fields and arts and sciences, we run the non-parametric analyses separately by field-group (Figure 5).⁹ Overall, employment characteristics of students in different fields do not differ much, thus challenging our hypothesis 3a. First, our results document that social origins much more strongly affect job quality patterns than field of study. The expected improvement of job quality for students from less privileged backgrounds is almost identical in both fields, vocational and arts and sciences. At the beginning of higher education, pay is influenced more strongly by parental occupational positions than by field of study. Regarding job fit and working fewer than 20 hours, the pattern of students from lower origins in arts and sciences differs from all others. In vocational fields, lower origin students are able to close the small gap in job-fit during the first four years of study, whereas students in arts and sciences catch up at a slower pace. At the same

⁹ For the full models see Table A3 in the Appendix.

time, students from lower classes in arts and sciences are least likely to work fewer than 20 hours per week at the end of their studies (i.e. they are more likely to work more than 20 hours), whereas all other students from higher classes (in both fields) maintained their resistance to high job intensity.

Our findings on wages and job-fit support *hypothesis 3b*: that social differentials in job quality (with the exception of wages) decrease more strongly in occupation-specific fields. Students from less privileged families in arts and sciences hold the least favourable jobs as the coherence of their field and job remains behind all other students and increases slowly. Compared with all other students, less-privileged students' risk of long working hours increases considerably towards the end of their studies.

Figure 5: Non-parametric local polynomial regressions on different indicators of student job quality over the course of studies, by field of study



Source: 16th German Student Survey, weighted. Population: employed students.
 Notes: Local polynomial regression (local mean smoothing); Epanechnikov-kernel, bandwidth<1.
 Job intensity: working more than 20h/week, 1=yes. (N: 5101)
 Hourly wage: € (N: 4970)
 Job fit: job related to students' field of study, 1=yes. (N: 5152)

Exploring the mechanisms behind differences among social origins

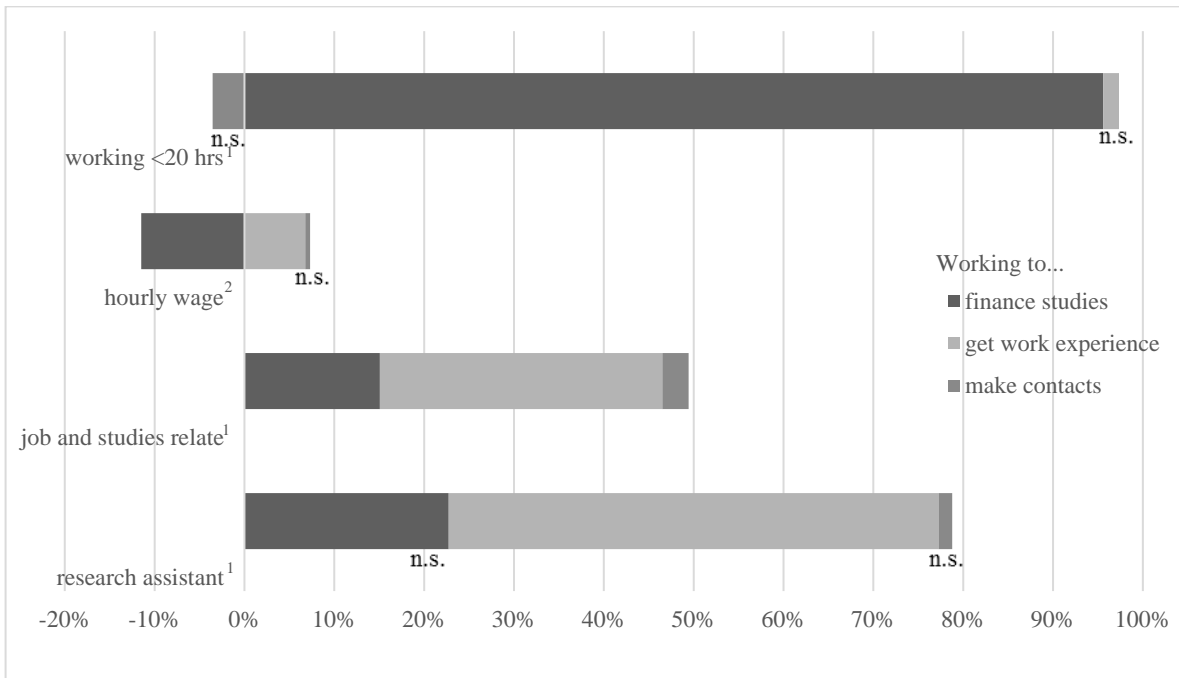
In this section, we examine our assumption that the rationale for working differs among students of different social origins and consider whether these different rationales explain the gap in job quality (*hypothesis 2b*). We assumed that students from lower social origins must cover at least part of their expenses through employment and that financial necessity would therefore be an important motivation to work. In contrast, students from the upper classes are more likely to look for jobs

offering valuable work experience and access to valuable networks. We now examine the degree to which these different motives explain the observed social differentials in students' job characteristics.

Figure 6 depicts the results of a decomposition analysis on these different motivations (see full models in the Appendix, Table A5).¹⁰ This decomposition allows us to evaluate the contribution of different motivations to explaining social differentials in job quality by estimating what share of the gap can be attributed to social origin differences in the distribution of these motivations. The results vary considerably for the different aspects of job quality. Differences in the probability of working long hours are mainly explained by the differences in the importance of earning for subsistence, while the contribution of getting work experience and making contacts are small in magnitude and not significant. Inequalities in whether the student's job relates to his/her field of study and in whether a student worked as a research assistant were explained by social differences in the importance of financing studies and making contacts; more so for working as a research assistant than for job fit. These results support our assumptions that students from higher backgrounds more likely seek to improve their skill profiles and networks whereas the high work intensity of students from lower origins is very much driven by their financial needs. However, the pronounced differences in wages could to a large extent not be explained by any of the motivation measures. The contribution is small (and not significant for making contacts) and for finance studies even negative, meaning that if the distribution of both groups were identical in these traits, the gap would be even larger.

¹⁰ Figure 6 visualizes the results. The full model in the Appendix shows the contribution and significance for each category of each motive separately.

Figure 6: Decomposition results of social origin differentials in job quality



Source: 16th German Student Survey; weighted

n.s.: not statistically significant at least the 0.05-level, z-test/t-test.

Notes: Variables held constant (full model in the Appendix): gender, marital status, intended type of degree, field of study, city, eligibility for means-tested federal studentship (BAföG), housing costs (any); n.s. not significant, i.e. $p > .05$

¹Non-linear Fairlie decomposition by social origin (Fairlie, 2005); 1.000 decomposition replications

²Linear Blinder-Oaxaca decomposition (Jann, 2008) by social origins.

Job intensity: working more than 20h/week, 1=yes. (N: 5101)

Hourly wage: € (N: 4970)

Job fit: job related to students' field of study, 1=yes. (N: 5152)

Research assistant: employed as teaching or research assistant by a university or research institute (on campus employment). (N: 5174)

Summary and discussion

In this article, we aimed at improving the understanding of inequalities in the quality of student employment. Our empirical analyses corroborated the hypothesised increase in job quality over time. Advanced students more often obtained jobs that were related to their studies, more frequently worked as research assistants and earned higher wages. Due to legal incentives, working with high intensity (20 hours or more) is a rare phenomenon in Germany and only less than 10 percent of students in the first 4 years of study do so. Regarding differences between social origins in student employment,

descriptive analyses showed that initial gaps in wages and job fit decreased with progression in higher education. Lower origin students in arts and sciences had a particularly low probability of a job that is related to student's field of study and a rather high risk of working long hours. However, the bivariate descriptive findings could not be fully confirmed in multivariate analyses, which failed to provide statistical significance for an overall convergence of wages and job fit (with the wage gap being significant at the 10%-level). Holding a job as a research assistant was not related to social origin. Decomposition analysis showed that the differences in work intensity were largely attributable to the financial needs of students from the lower classes, whereas social differences in job fit were explained by differences in the importance attributed to gaining work experience and building networks with co-workers. In contrast, inequality in wages was hardly explained by different rationales for engaging in work.

Our findings contribute in several ways to the research on social inequalities in higher education and in the labour market. First, we show that inequalities exist beyond students' entry into higher education; they persist in the quality of student employment. Students from disadvantaged backgrounds earn less and are less likely to occupy jobs that potentially equip them with assets for their later working careers. Testing the declining gap as an interaction effect in a multivariate model, however, does not lead to statistically significant results. Thus, the reduction of inequalities that we observe in our non-parametric analysis is due to social inequalities in pre-study conditions and study programmes.

Second, in contrast to our hypothesis, inequality in work intensity actually increases rather than decreases in tendency, but again not statistically significant. The observed share of students who work more than 20 hours/week increasing among students from lower origins might be related to socially different behaviour in higher education, e.g. if students from lower origins have a higher tendency to leave higher education or that for these students employment is a stage preceding drop-

out (cf. McCoy and Smyth, 2007). In both cases, inequalities in performance and achievement may occur if students from lower backgrounds actually leave higher education or if their high work demands reduce the time they can devote to studying.

Third, our decomposition analysis shows whether and how the observed social differences in job quality are explained by class-specific motivations for working. A particularly large share of the social gap in job intensity can be linked to differences in the financial necessity of paid employment. To a lesser extent, financial necessity also matters when we examine differences in whether the job is related to a student's field of study. However, financial necessity does not lead students to seek high-paid jobs but rather to work more hours. Furthermore, the wage advantage of students from higher classes, who more often occupy jobs that fit their studies, indicates that employers do not pay lower wages to (upper-class) students as a type of trade-off for non-monetary returns such as valuable work experience, training or networks.

In addition, the results at least partially contradict the hypothesis that students from less privileged families face barriers in accessing high-quality jobs. We find no advantage for students from the upper classes in entering jobs as research assistants, although their parents tend to be more familiar with practices in higher education and on-campus jobs. Performance in higher education, which can only be judged after completion of at least some courses, appears to be a key criterion for selection.

Finally, our findings contribute to broader discussions of the value of higher education and field-specific linkages to the labour market. The overall improvement of job quality over the course of study indicates that employability increases as students progress through their educations. This finding is corroborated by similar patterns in arts and sciences and in occupation-specific fields.

However, our study is limited in several ways. Even though we control for a range of individual characteristics we cannot rule out that students select into higher education, fields of study

or into specific student jobs by unobserved characteristics. This may influence our coefficients, generally in an unknown way. While we are generally confident that the variables we control for cover a wide range of the possible sources of bias, our analyses of enrolled students' behavior cannot cover social inequalities with regard to entry into higher education. Several studies indicate that especially those students who expect financial difficulties refrain from enrolment (e.g. Hillmert and Jacob 2003; Schindler and Lörz 2012). If indeed the worst-of individuals select out, who are most likely to be found among the lower classes, inequalities we find are more likely to be attenuated and might be somewhat higher if access to higher education would more equal.

Results presented in this article are limited to Germany at one point in time and the generalizability to German students in the post-Bologna era, as well as to inequality in student's employment in other countries needs further investigation. The, in spite of the expansion of higher education, quite stable rates of student employment over the last years (e.g. Middendorff et al 2017: 60) would suggest that there was no fundamental change in students employment situation. Across Europe, student employment is common, although to different degrees (see Allen and van der Velden, 2009: 22ff). While we assume that the theoretical principles we propose are general and could be applied to other historical periods and countries, some specifics of the German situation in 2000 must be mentioned to put our results in context and to ponder about temporal and spatial limitations of our study. First, by international comparison, access to higher education is socially selective in Germany (Shavit et al., 2007), which affects the socio-economic composition of students and thus potentially increases the selection mechanism described just above. Therefore, our research question could have had even stronger relevance in contexts with a more heterogeneous student body. Second, educational costs are low because there were no tuition fees in the year our data was collected. In addition, Germany does have student aid programmes, but provision is less generous than elsewhere and is partially loan based (Usher and Cervenán, 2005). This situation indicates the need for replication of

our analysis in other contexts with higher costs of postsecondary education. One potential question of interest would be to use changes in tuition fees as a natural experiment of financial pressure. While the German tuition fees that were introduced and abolished during 2005 and 2012 in several federal states were rather modest (typical tuition costs were no more than €500 per semester), steeper increases in other contexts might be used as exogenous variation of costs. Third, in the pre-Bologna phase in Germany, most students followed *one* study program (e.g. Diplom). In contrast, students in present day consecutive and short study programs may show different job quality patterns: For example, students in shorter may select more carefully their first job or remain longer in an initial job to avoid employment with short duration. In that case, social inequalities would rather increase than decrease. After having attained a Bachelor's degree, job opportunities of student's in enrolled in Master programs may change considerably as they have already a completed higher education degree. Hence, social inequalities among advanced students might disappear after completion of a Bachelor's degree. Finally, labour market structures such as supply of student jobs and the demand of student job seekers may affect employment patterns (cf. Jacob, Gerth and Weiss 2017). Since 2000 the total number of students in Germany increased from 1,7m students to 2,8m students in 2015 (Statistisches Bundesamt 2017). Given job opportunities are to some degree limited, this expansion would drive competition on the student labour market: employers can increase their hiring criteria and reduce wages. This would aggravate the observed pattern as students from higher social origins can afford to withdraw from the labour market. Summing up, while we believe that our analyses and results are rather conservative and to a large degree valid for other contexts, more research is necessary to shed light on these post hoc considerations.

What are the policy implications of our results? Inequality was greatest among first-year students, which is relevant to the design of financial aid programmes. If students must work even to begin their studies, those who are afraid of this double burden may be more likely to choose other

programmes with guaranteed funding, such as firm-based vocational training in the German case. The relation of social origins, economic resources and student employment is further emphasised by the fact that students' stated financial needs explain, to a large extent, the inequalities in their job characteristics. Our dichotomisation of social origins is elitist because the comparison group does not solely consist of working-class offspring but also contains students from intermediate and lower service-class origins. Thus, a broader inclusion of student programmes, not just means-tested subsidies for the poorest students, may facilitate access to higher education and reduce the differences among students' lives. Consequently, a reduction of financial strain contributes to giving students equal opportunities for strong academic performance and future successful labour market outcomes.

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