The COVID-19 pandemic and the financial situation of students*

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Abstract

Many university students depend on working alongside their studies. The closing of universities and the loss of many typical student jobs during the COVID-19 pandemic particularly affected their situation. Based on a student survey at a major German university, we analyze changes in students' income and its composition throughout the different phases of the pandemic in Germany. Students' job income declined by 66% (total income by 19%), on average, during the first lockdown. Although there was a quick recovery during the re-opening, a job income loss of -23% remained, which was reinforced during the second lockdown (-34%). Students compensated by increasing loan financing and reducing their leisure expenses. Women and students from non-academic background were particularly affected by the job income loss and the compensation effects, thus widening pre-existing financial inequalities. Thus far, this has not resulted in differences in dropout intentions, which increased however in all groups.

Keywords: higher education; student earnings; student employment; inequality

JEL classification: I23, I24

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1 Introduction

Since spring 2020, the COVID-19 pandemic and the imposed policy measures for mitigating its harmful consequences (including two lockdowns of the economy) have changed and shaped life in Germany, including the higher education system. The closure of universities and the shift to online teaching had impacts on students' mental and physical health (see, e.g. Aucejo et al., 2020; Rodríguez-Planas, 2020) and their study progress and learning outcomes (see, e.g. Aucejo et al., 2020; Belghith et al., 2020; Rodríguez-Planas, 2021). The related decline in employment, especially in marginal employment, affected students' employment and their financial situation (see, e.g. Aristovnik et al., 2020; Aucejo et al., 2020; Belghith et al., 2020). Since changes of the economic situation may directly affect study progress, study success and – at least indirectly – mental health, we expect heterogeneous effects of the pandemic on aspects prone to emphasize inequality, e.g. gender differences and socio-economic background (see also Doolan et al., 2021; Farnell et al., 2021; Jaeger et al., 2021). Differential impacts in these dimensions may further increase existing social inequalities in education, and set back past efforts to create equal opportunities.

Analyzing and quantifying the contribution of the COVID-19 pandemic and the associated losses for students – with a further differentiation in specific socio-economic groups – can thus provide important evidence for the design of educational and social policies. For this purpose, we developed an online survey instrument that allows us to compare financial developments of socio-economic groups during the pandemic. We focus on the level of income and its composition with regard to different sources (e.g. parental support, income from work, loans etc.), and conduct heterogeneity analyses accounting for differences in students educational background and gender. This differentiation helps to understand in how far social inequality has increased due to the pandemic. In contrast to existing surveys (e.g. Becker and Lörz, 2020), we differentiate the pandemic into the five different chronological phases according to the characteristic economic restrictions (1: pre-pandemic; 2: first lockdown; 3: relaxation; 4: second lockdown;

and 5: future development). We use these to identify students (changing) adaptation strategies to income and employment shocks. The online survey was conducted in June 2021 at the Leibniz University Hannover, one of nine leading technical universities in Germany. We provide some checks that the sample is reasonably representative of the population of the university. The findings should therefore depict some general patterns of students in Germany.

Our empirical results show an average decrease in students' total income of about 19% during the first lockdown (March until May 2020) in Germany. The decomposition of income sources reveals that this decrease resulted from negative consequences on students' jobs (dismissal, unpaid leave, reduced working time) due to the imposed economic restrictions. With one in two students affected by job restrictions, these consequences were far reaching. Student job income was, on average, about 66% lower during this time than in the pre-pandemic phase. Job income losses persisted further to the time after the first lockdown (-23%). Although again stronger during the second lockdown (-34%), the losses were on average only about half as large as in the first lockdown but remained substantial. Students have (partly) compensated for the decrease in job income by increasing loan financing (financial aid). Students expect their financial situation to improve after the second lockdown in terms of total income (+11%, compared to the pre-pandemic phase), mainly due to higher expectations of parental support and income from work.

The results from our survey further suggest heterogeneous effects. The differences between the genders are small. Women and men appear to suffer almost equal financial losses during the first lockdown. Women experience greater losses in their income from work, particularly in the time after the first lockdown and in the second lockdown, when men's income from work was already back to pre-pandemic levels. However, compared to men, women expect to be in a better financial position after the second lockdown (+14%) than before the pandemic, especially due to increasing parental funding. Our analysis reveals pronounced differences in the

recent and prospective economic situation for students from different educational parental backgrounds: the financial situation of students from non-academic backgrounds worsened significantly. Although the decline in total income is quite similar compared to students from academic backgrounds, they have larger losses in work income, on which they rely more strongly. In line with this, only students from academic backgrounds expect an increase in total income after the second lockdown (+14%) due to higher parental support and higher work income. In contrast, students from non-academic backgrounds expect a higher dependence on loan financing in the future.

The decline in income during the first lockdown is reflected in student expenses. Students compensated for the decrease in income in the first lockdown mainly by reducing expenses (for living and leisure). While cost of living declined only in the first lockdown, spending on leisure has remained below pre-pandemic levels until the second lockdown. Both cuts led to a limitation of the quality of life in the affected phases. Housing expenses could not be adjusted in the short run, and we find no increased move back to parents. In contrast to the different patterns in income, the development of expenses is quite homogenous across socio-economic groups of students. Since students expect their average monthly expenses to increase for the time after the second lockdown, income inequality will become more important.

Our results thus reveal that students were much stronger affected by labor market restrictions than the population on average. They were at the same time less eligible for labor market subsidies provided on large scale for the majority of workers. The (short-term) impact of the COVID-19 pandemic is a widening of existing financial inequalities between different socio-economic groups. The heterogeneous impacts of the pandemic across socio-economic groups threat the objective of equal chances and anew emphasize the role of social origin. The losses in income could lead to compensatory effects, i.e. dropping out or extending studies, for the more affected students. During the first lockdown 3% of the students had the intention to

drop out of their studies, and 17% stated they would prolong their studies due to financial concerns. With the longer duration of the pandemic, students' intention on both issues has increased to 12% and 26% (second lockdown).

2 Theoretical Background

There is a broad consensus in the countries of the European Higher Education Area (EHEA) on the principle of equality of educational opportunities in higher education. Expressed as one core objective by the Rome Ministerial Communiqué (2020), member countries should improve the social dimension by 2030 (EHEA, 2020a). Access, participation, progression and completion of higher education should depend on students' abilities only, and not on their personal characteristics, or circumstances they have no direct influence on. In particular, opportunities for higher education of vulnerable, disadvantaged, and underrepresented students (e.g. gender, age, nationality, geographic origin, socio-economic background and ethnic minorities) should be improved (EHEA, 2020b).

Nevertheless, despite this consensus, the social reality may look different. Social educational inequalities exist when there is a systematic relationship between educational success (in terms of participation or achievement) and social origin (in terms of economic, cultural or social capital) (Maaz and Nagy, 2009). For example, women's participation in higher education has increased by so much in recent decades that their share now exceeds that of men in many European countries, except in Germany. While the average share of female students in Europe is 56%, in Germany this share is 48% (Hauschildt et al., 2021). Gender inequalities exist further with regard to field of study; women are more likely to study in education, health, or social services than in engineering, manufacturing, or construction (Hauschildt et al., 2021).

Differences with respect to parental background persist as well. Although the participation of students from non-academic backgrounds has increased in absolute and relative terms since the 1950s, there is still notable social inequality in university access. While 79% of children

from academic backgrounds start studying in Germany, the corresponding share of those from non-academic backgrounds is 27% only. Given a share of parents with a tertiary education in the population of 28% (Kracke et al., 2018), Germany possesses a strong overrepresentation of students from academic backgrounds (73%) compared to the European average of about 50% (Hauschildt et al., 2021). Empirical evidence suggests that educational inequality in the transition to traditional university remains constant or even slightly increases across cohorts despite free-of-tuition university education in Germany (Blossfeld et al., 2015).

Boudon (1974) reasons that social inequalities in education result from primary and secondary effects that interact in the transition between educational institutions. Primary effects describe differences in social background that affect the likelihood of success at school. Secondary effects of origin include behavior in educational decisions based on individual cost-benefit considerations. Here, the costs (i.e. direct and opportunity costs) are compared with the (future) benefits (expected returns, career opportunities, status) and assessed in light of the estimated probability of success (Kracke et al., 2018). Decisions between different educational paths vary due to social-origin dependent assessments of these individual factors.

The literature on gender differences finds that, on average, women are more risk averse, less confident in their academic abilities, and expect lower income gains from higher education than men (see Bertrand, 2011, for an overview). In addition, they are less receptive to income expectations than men. To some extent, this explains the lower enrolment in fields of study with higher returns, such as STEM studies (Declercq et al., 2018). Status concerns have been identified as another reason. Due to a feared loss of status, students from advantaged socio-economic backgrounds possess a higher educational motivation (Erikson and Jonsson, 1996; Breen and Goldthorpe, 1997). Students from disadvantaged socio-economic backgrounds, in contrast, are less likely to pursue higher educational attainment and to choose more economically rewarding academic careers because of their risk aversion (Breen et al., 2014). This is fueled

further by biased perceptions of lower educational persons: they tend to overestimate educational costs and underestimate educational returns at the same time (Becker and Hecken, 2009).

A tuition-free study might be expected to be an efficient means of reducing inequality. As a flipside of the system, however, Germany provides no comprehensive support system.[1] The share of national public student funding on total composition of student funding is below the European average. Moreover, the share of non-repayable support (i.e., grants and scholarships) is lower as well, and repayable support (i.e., loans, which can bear interest) is more commonly used. This triggers the bias of the just described cost-benefit considerations for different economic groups, since secure future costs (i.e. repayments) have to be compared to insecure returns.

The lack of a comprehensive support system may be a key reason, why family funding and self-earned income account for the majority of student funding (Hauschildt et al., 2021). Despite quite low costs of study, inequality in students' economic backgrounds translates into inequality in higher education. Female students as well as students from non-academic backgrounds are more likely to (have to) work than male students and students from academic backgrounds (Middendorff et al., 2017). In contrast to full-time employees, students mainly generate income to cover their living expenses. For instance, half of the working students declare that they are not able to study without income from work (Hauschildt et al., 2021).[2] Since students do not save in general, changes in income are a direct indicator of subsistence, and will directly affect studies and study progress (Chen and DesJardins, 2010; Glocker, 2011). Moreover, a decline in employment and income from work, especially for those from disadvantaged socio-

[1] The BAfoeG Act regulates financial aid to students in Germany, to increase equal opportunities in higher education. Students from low-income families are eligible for a BAfoeG loan (need-based). The share of supported students is about 11% of the total number of students. International students are generally not eligible. BAfoeG payments are made according to fixed amounts of need, against which the income/assets of the student as well as those of the parents are taken into account. The maximum amount per month is 861 Euros. BAfoeG loans are generally given to students' half as an interest-free repayable loan and half as a non-repayable grant.

[2] This becomes also evident from our data. The average monthly cost of housing and living (513 Euros) exceeds the average monthly income without own income (446 Euros) (see Appendix Table A.4 and Table A.5).

economic backgrounds, will lead to widening social educational inequality. The economic consequences may negatively affect access, success, dropout probability, mobility, etc. in higher education. The resulting social inequalities in educational participation are not consistent with a sense of equity. This is because – unlike the inequalities resulting from primary effects – secondary effects are not the result of differences in performance among students (Maaz and Nagy, 2009).

3 Data

3.1 Data Collection: The Phases of the Pandemic in Germany

To obtain up-to-date information on the impact of the pandemic, we collected primary data through an online student survey at the Leibniz University Hannover. In our survey, we divide the pandemic into five different temporal phases of economic restrictions to identify the changes in students' financial situations.

The phases cover the period from January 2020 to the time of the invitation to the survey in June 2021. Phase 1 is the pre-pandemic phase (January 1 until March 22, 2020). Phase 2 is then the first lockdown in Germany (March 23 until May 6, 2020). This lockdown included a couple of non-pharmaceutical interventions (NPIs), such as restrictions on public life, e.g. social distancing measures, and the closure of stores, restaurants, clubs, bars, museums and numerous other service businesses and cultural institutions. In the sectors affected, as well as in industry and commerce, many employees were sent into government-subsidized short-time work. Universities stopped face-to-face teaching in March and April 2020 until further notice, and decided to hold the summer semester 2020 (April to July) largely as an online semester. The Leibniz University Hannover postponed the start of the semester to the end of April 2020, and completely switched to online teaching.

Restrictions were relaxed in phase 3 through the gradual opening of public life (May 7 until November 1, 2020). Stores and other service businesses were gradually able to reopen. In mid-

May 2020, restaurants were allowed to reopen, but not at full capacity. In mid-June 2020, further relaxations came into force in many areas of public life.[3] Online university teaching, on the other hand, was maintained and the return of students to campus was postponed further. During this period the government responded with adjustments to the BAfoeG Act[4], and further financial aid for students in pandemic-related financial distress.[5]

Phase 4 is the second lockdown (November 2, 2020 until May 8, 2021) in Germany. Once again, restaurants, clubs, bars, cultural institutions and numerous other service businesses were closed.[6] In contrast to the first lockdown, stores were not closed until mid-December 2020. In addition to public life restrictions, companies were urged to enable mobile working. Again, many employees were sent into state-subsidized short-time work. At the end of December 2020, the COVID-19 vaccination campaign started, with vaccinations distributed in four priority groups. After about five months in lockdown, retail, cultural institutions as well as body-related services could reopen from March 8, 2021, provided there is a hygiene concept, customers/visitors tested negative for COVID-19, and capacity is limited. In late April 2021, the Federal Government announced that the COVID-19 vaccination prioritization would be removed in June 2021, allowing students (who were not previously a priority group) to become vaccinated.

Phase 5 includes the gradual lifting of most pandemic restrictions for districts with COVID-19 cases per 100,000 inhabitants during the last seven days below 100 (May 9 until the date of the survey in June, 2021). In Hanover, most restrictions on restaurants, clubs, bars, cultural institutions, retail, service sector, leisure and social restrictions were lifted as of the end of May

[3] As of June 2020, companies, self-employed persons and associations were eligible for a staggered fixed cost allowance in the case of pandemic-related sales declines.

[4] During the pandemic, the BAfoeG Act was adjusted. Comparatively high incomes in the first months of the pandemic should not lead to a loss of BAfoeG entitlement. Since the individual regular period of study of students has been extended, the funding period is also extended as a result.

[5] On the one hand, the already existing student loan (amount of the loan: up to 650 Euros per month) was made interest-free for all students from May 2020 to the end of 2021 without any preconditions. On the other hand, all students with a proven acute pandemic-related need (for example, due to a job loss) could receive a non-repayable grant of between 100 and 500 Euros per month from mid-June 2020 to the end of March 2021.

[6] Companies, self-employed persons and associations that were affected by the closures, were eligible for short-term public subsidies by application. So-called November and December assistance.

2021. Vaccination prioritization was generally lifted on June 7, 2021. Teaching at the Leibniz University Hannover still took place online during the summer semester of 2021.

In our survey, students should indicate their expected financial situation for the period after the second lockdown. The information provided by the students does not refer to the past period indicated at the time of the survey (not retrospective), but to the future expectation for the winter semester (prospective; about four months in advance). Student expectations were taken under the assumption that teaching would return to face-to-face in the following semester. The assumption seems plausible, as the Leibniz University Hannover has switched back to face-to-face teaching in the winter semester 2021/2022.

3.2 Data Collection: The Survey

The survey was carried out from June 7 until July 2, 2021. About 12,400 students of the Leibniz University Hannover were randomly selected and invited to participate in the survey via their official correspondence e-mail, filed with the enrollment office. We incentivized participation by donating one Euro per complete participation to one of three charitable organizations[7] offered for selection. In total, 1,381 responded to the survey. The gross response rate of about 11% is thus slightly lower than the gross response rate of 15% of the Germany-wide survey by Becker and Lörz (2020). The median completion time for students who completed the questionnaire completely was 14.7 minutes.

We surveyed information on the financial situation (income and expenses), employment, and housing situation of students during the different phases of the pandemic. In our analysis, we use the classification by Hauschildt et al. (2021) to describe student funding. It distinguishes between parental support, own job income, loan financing and other funding.[8] Moreover, we

[7] Deutsches Rotes Kreuz-Landesverband Niedersachsen e.V., Obdachlosenhilfe Hannover e.V. and Per Mertesacker Stiftung.

[8] Parental support implies allowances from parents, relatives, friends, etc. Loan financing includes BAfoeG, student loan and financial aid for students in pandemic-related financial distress, other funding includes e.g. scholarships or orphan's pension.

collected data on relevant socio-demographic and student characteristics, such as gender, age, nationality, parental education background, vocational training, own apartment, semester, field of study and targeted degree (see Appendix Table A.1). These characteristics were chosen since they contain information relevant to explain the financial situation of students.[9]

For the empirical analysis, some restrictions on the sample had to be imposed. Since only 630 observations contain information on income for all five phases, we have removed those with missing information for any of the phases from the sample. Furthermore, we recoded the top 1% percentile of each income source in the sample to the value of the 99% percentile of each income source to avoid outliers or implausible data. We also dropped observations with missing information on socio-economic variables relevant for the heterogeneity analyses. The final sample includes 612 responses of students, leading to a balanced panel with 3,060 observations (612×5).

3.3 Representativity

The Leibniz University Hannover is one of the nine leading technical universities in Germany and characterized by a relatively high share of local students. With the composition of its students, it represents a typical German technical university, i.e. characterized by slightly less female, more international, and more master's students than the average. Compared to the Leibniz University Hannover and the population in Germany, women and master's students are slightly overrepresented in the analysis sample, while first-year students and international students are underrepresented (see Appendix Table A.2 for details).[10] Since we use a cross-sectional survey

[9] Age, nationality, parental education background, own housing, or type of degree relate in various ways to the level of income and its composition (see e.g. Hauschildt et al., 2021; Middendorff et al., 2017). We also needed information on gender, parents' education level, and nationality for the heterogeneity analyses. Due to the low share of students with a migration background in our sample, we did not conduct a heterogeneity analysis by nationality.

[10] We have considered a potential bias in the empirical results in a robustness check reweighting the observations below.

of enrolled students, systematic dropouts may impose a potential issue. To check this, we compared the development of dropout rates over the three years in the pre-pandemic phase (summer semester 2017 to winter semester 2019) and in the period during the pandemic (summer semester 2020 to summer semester 2021) (see Appendix Table A.3). There are no significant differences between the two periods. We are therefore quite confident that our sample is representative for the population of students at the Leibniz University Hannover and is not biased by a systematic change in the dropout rate. Due to the cross-sectional design, information reported on earlier phases may be subject to memory bias. However, we asked for very basic information (employment, housing, income, and expenses), and we did not observe any implausible answers, we assume students' responses to be not biased systematically.

4 Estimation Strategy

4.1 Main Effects

To evaluate the effects of the different phases of economic restrictions of the pandemic on students' income and funding composition, we conduct an analysis in sense of a time-series event study. We use the sudden economic restrictions with the beginning of the first lockdown (March 23, 2020) as an event (causing an all-encompassing social shock) that divides our observation window into before and after the onset of the pandemic. This allows us to estimate changes in individual income as treatment effects by comparing income before and after the beginning of the first lockdown (treatment).[11] We estimate the following fixed effects panel regression model over the five phases:

$$\ln(y_{it}) = \alpha + \beta Phase_{it} + \delta_i + \varepsilon_{it}, \quad (1)$$

[11] We do not determine dynamic effects (as in difference-in-differences approaches with staggered roll-out) because all students experience the treatment simultaneously.

where $\ln(y_{it})$ denotes the log of income y for student i at time t. To measure the composition of student funding, we break down total income into (I) allowances from *parents*, (II) *job* income, (III) *loan financing* and (IV) *other* income, and estimate a separate model for each outcome in a second step. β captures the effect of interest of the respective phase (phase 2 to phase 5), given as percentage change in income in comparison to the pre-pandemic value α (phase 1). Since our estimation model is a log-level model, we convert the β coefficients for an exact interpretation.[12] δ_i is the fixed individual effect. It captures all (observable and unobservable) time-invariant differences between students affecting y. Robust standard errors are clustered at the individual level.

If there are no systematic changes in income other than the treatment over the considered period, the change in income (β) can be interpreted as a causal effect of the economic consequences of the pandemic. Since our observation window is relatively short (before and after the treatment), we assume that there are no further (short-term) income effects (unrelated to the treatment) besides the pandemic.[13] Given our reasoning on plausibility, the empirical estimates below reflect a causal relationship.

4.2 Socio-Economic Heterogeneity

To investigate whether existing educational inequalities have widened as a result of the economic effects of the pandemic, we conduct heterogeneity analyses by gender and parental background similar to Aucejo et al. (2020) and Jaeger et al. (2021). We refer to parental education background instead of parental income, since education in Germany strongly depends on the it (see section 2).

[12] In the case of an increase of the phase by one unit, the income changes on average (*ceteris paribus*) by exactly $100*(e^{\beta} - 1)$ %. In our regression tables, we show this converted percentage change in student income compared to the baseline level of income in the pre-pandemic phase. The initial coefficients and the robust standard errors of the separate estimations are presented in the Appendix (see Appendix Tables A.9 to A.12).

[13] A possible threat of seasonality seems to be negligible, since students generally do not save their income but spend it on covering their living expenses (Middendorff et al., 2017).

To test whether educational inequalities change during the phases of the pandemic, we estimate the following model:

$$\ln(y_{it}) = \nu + \gamma Phase_{it} + \vartheta_i + \epsilon_{it}|k, \quad (2)$$

where the sample condition k denotes the different subsamples. We estimate a separate model for each gender (women and men) and two types of parental education background (academic and non-academic[14]). The rest of the notation and the interpretation of the coefficients does not differ from equation 1.

5 Results

5.1 A Description of Students' Income

Figure 1 shows the average monthly income of students and its composition (parental support, job income, loan financing and other funding) in each of the five phases of the pandemic (in Euros and in shares in %) for the total sample. The values of the average monthly income of students are then differentiated by gender and by parental education background.

[Insert Fig. 1 here]

The average monthly income of students in the pre-pandemic phase (phase 1) is 877 Euros (see Appendix Table A.4). The great majority of students receive financial support from their parents (74%), on average 326 Euros (37% of total income). About 72% of students are employed during their studies. From this, students earn an average of 431 Euros (49% of total income). About 20% of students partly finance their studies (among other sources) through loan financing, which accounts for a share of about 11% of total income (mean: 96 Euros).[15]

[14] We assign an academic background if at least one parent possesses a tertiary degree.

[15] These numbers closely reflect results from relevant research. Becker and Lörz (2020), e.g., show in a nationwide sample that the average income of students before the pandemic was 857 Euros. Of this, about 315 Euros (37%) is parental support, 360 Euros (42%) is own earnings, and 120 Euros (14%) is loan financing.

When looking at the socio-economic subgroups, differences in monthly income and in the composition of students' funding become visible (see Fig. 1). While women have a mean income of about 855 Euros, this value is about 909 Euros for men (see Appendix Table A.6). Parental support does not differ by gender. While men, on average, have higher own earnings (486 Euros) than women (391 Euros) (despite same employment rate)[16], the latter use loan financing more frequently (22%) than men (16%).

The composition of monthly income varies clearly by parental education background of students (see Fig. 1). Students from non-academic backgrounds have a slightly higher average monthly income (908 Euros) than students from academic backgrounds (850 Euros) (see Appendix Table A.7). While students from academic backgrounds receive more than 100 Euros higher parental support, the value is reflected in higher own income from students from non-academic backgrounds. The large difference in job income is partly due to the higher employment rate of students from non-academic backgrounds. It can be assumed that they also work more hours than students from academic backgrounds and/or have higher wages, since one in four of these students completed vocational training prior to their studies (among students from academic backgrounds, the share is 13%). Students from non-academic backgrounds also make more frequently use of loan financing.[17]

Turning to the development over the pandemic compared to the pre-pandemic income (phase 1), a sharp decline in average monthly income is visible for all students (including subgroups by gender and parental education background) (see Fig. 1). The composition of student income changes in course of the different phases: while parental support appeared constant across the five phases, job income declined during the first lockdown (phase 2). In the following

[16] The difference could be due to higher wages of men. 23% of men have completed vocational training prior to studying, while the share for women is 16%. This could have an effect on the level of wages.

[17] This is also consistent with earlier findings for Germany that show that students from non-academic backgrounds rely more on their job income and on loans due to lower parental support (Middendorff et al., 2017).

phases (phases 3 to 5), income and its composition seem to have recovered to the pre-pandemic level.

5.2 A Description of Students' Expenses

Figure 2 decomposes the average monthly expenses of students (housing, cost of living and leisure[18]) in each of the five phases of the pandemic, for the total sample and differentiated by gender and parental education background. The highest average monthly expenses in the pre-pandemic phase (phase 1) were students' housing costs (about 307 Euros, see Appendix Table A.5). In total, about 76% of students lived in their own apartment, or at least paid money for housing. The cost of living was on average 206 Euros per month. In addition, they spent an average of 70 Euros on their leisure time.[19] In contrast to students' income, there are no sizeable differences in the amount and composition of students' expenses between genders and parental education backgrounds. Employed students as well as students with own apartment spent more on housing and living, on average.

[Insert Fig. 2 here]

Corresponding to the income, expenses declined sharply during the first lockdown (see Fig. 2). While housing expenses remained constant, spending on living decreased slightly, while leisure expenditures were substantially lower. Except for leisure, the spending situation appears to have returned to the baseline situation in the relaxation (phase 3) and have been more or less stable during the second lockdown (phase 4). For the time after the second lockdown, students expect increases in all three components. Clear socio-economic differences in expenses cannot be established. Hence, differences in the income situation will translate directly into financial

[18] The composition is based on Middendorff et al. (2017). In our analysis, we focus on three of the main expenses of students. We do not consider "other expenses". Since the expenses are therefore incomplete, we cannot conclude on the total expenses of students.

[19] Middendorff et al. (2017) show comparable average expenses: housing 323 Euros, food 168 Euros, and leisure 61 Euros.

inequalities. If expenses increase at the same rate, the financial situation will asymmetrically worsen for students whose income situation is deteriorating.

5.3 Estimation Results: Main Effects

To allow a causal interpretation, we estimated students' income by equation 1. Table 1 shows a statistically significant decrease in income during the first lockdown (phase 2) by about 19%. There are no statistically significant effects on income during the relaxation phase (phase 3) and the second lockdown (phase 4). Thus, the income in these phases returned approximately back to pre-pandemic baseline level. In phase 5, the expected income increases even by about 11% in comparison to the pre-pandemic baseline level.[20]

[Insert Table 1 here]

To decompose these effects, Table 1 also reports the empirical results for the single sources of income. About 72% of students were employed while studying (see Appendix Table A.4 for descriptive statistics). Of these, one in two students experienced negative consequences on the job (dismissal, unpaid leave or reduced working time) during the first lockdown (phase 2) (see Appendix Table A.8), resulting in a decline in the employment rate of about 17 percentage points. As a consequence, students' job income decreased by about 66% during the first lockdown (phase 2) in comparison to the mean of 431 Euros in the pre-pandemic phase (phase 1) (see Table 1).

After the first lockdown (phase 2), the student employment rate increased again and almost reached the pre-pandemic level, but in the relaxation phase (phase 3) students' job income was still about 23% lower than before the pandemic. This reflects the restriction on possible working hours during this phase (likely because some branches, such as restaurants, could not use their

[20] Our findings are further robust to different specifications: pooled OLS regressions with and without covariates (socio-demographic and student characteristics) and with reweighting with the shares of the Leibniz University Hannover (see Appendix Table A.13).

full capacity) (see Appendix Table A.8). During the second lockdown (phase 4), the employment rate was slightly lower than the pre-pandemic rate by about 6 percentage points. Even though this decline was not as sharp as during the first lockdown, it resulted in 34% lower job income in comparison to the baseline level. The losses were, on average, only about half as large as in the first lockdown but still substantial. For phase 5, about 77% of students expect to be employed (see Appendix Table A.4) and therefore expect their job income to be higher than in the pre-pandemic phase (+30.7%, baseline value: 431 Euros).

In contrast to the variation in job income, parental support has been very constant up to phase 4. For phase 5, students expect an increase in parental support of about 20% from the baseline level of 326 Euros (phase 1). To compensate for the drop in income, students seem to make more use of loan financing from phase 3 (relaxation phase) onwards (see Table 1). The highest increase in loan financing occurred during the second lockdown (+46.5%, baseline value: 96 Euros).[21] Hence, the income changes were mainly due to negative impacts of the pandemic on employed students (see Appendix Table A.14).

5.4 Estimation Results: Heterogeneous Effects for Subgroups

Given the educational inequality and its reasoned discussed above, we analyze effect heterogeneity by gender and parental education background. The decline in income during the first lockdown is statistically significant also for each of the four subgroups (see Table 2). Similar to the results for the main sample, there is no effect for the relaxation phase (phase 3) and for the second lockdown (phase 4) for all subgroups (as in the total sample). In phase 5, the expected

[21] This seems to be due to an increased use of loan financing (pre-pandemic: 20%; second lockdown: 26%) (see Appendix Table A.4). The share of students receiving BAfoeG loans increased from about 15% before the pandemic to about 17% in phases 4 and 5, which equals an increase in expected BAfoeG payments in phase 5 of about 17% compared to the pre-pandemic mean (77 Euros). In contrast, pandemic financial aid was used by less than 5% of students only.

income increases only for women (+13.5%, baseline value: 855 Euros) and students from academic backgrounds (+14.2%, baseline value: 850 Euros) in comparison to the pre-pandemic phase (phase 1).

[Insert Table 2 here]

Turning to differences in composition, women's (men's) job income decreased by about 71% (56%) during the first lockdown.[22] Women's job income also declined during the relaxation phase (phase 3) (-25.7%) and the second lockdown (phase 4) (-40.6%) compared to the time before the pandemic, but no effects are found for men. On the contrary, only males expect an income increase from work in phase 5 (by about 44%). Corresponding patterns can be established for parental support. While it remained constant for males over the phases considered, it increased for females by about 23% during the second lockdown (phase 4) and about 29% during the phase thereafter (phase 5). While loan financing is higher for women and men in phases 3 and 4 (than in the pre-pandemic phase), this trend persists only for women into phase 5. Thus, it appears that women that are more affected by the pandemic are compensating for the drop in job income particularly through higher parental support.

[Insert Table 3 here]

More pronounced differences can be seen when differentiating by parental education background. Students from academic backgrounds experienced a similar strong decline in job income as students from non-academic backgrounds (-62.4%, baseline value: 379 Euros respectively -68.9%, baseline value: 490 Euros) during the first lockdown (see Table 4). In contrast to academic backgrounds, the job income of students from non-academic backgrounds remained significantly lower during the following phases 3 and 4. In addition, exclusively for the latter, both expected job income (+49.9%, baseline value: 379 Euros) and expected parental

[22] Baseline value for women (men): 391 (486) Euro.

funding (+41.6%, baseline level: 376 Euros) increases in phase 5 (expectation) compared to the pre-pandemic phase (phase 1). There are also differences between the loan financing income of the two groups. Until the second lockdown (phase 4), the income from loan financing of students from non-academic backgrounds increased disproportionately by 81% (baseline value: 132 Euros) compared to 22% (baseline value: 65 Euros) for those from academic backgrounds.[23] In phase 5, only students from non-academic backgrounds also expect an increase in loan financing (+53.9%).

[Insert Table 4 here]

6 Discussion

6.1 Impact on Students' Financial Situation

The short-term temporary decline in total income in the first lockdown (see Table 1) suggests that the pandemic could be characterized as a transitory crisis for students, since income, on average, quickly returned to the pre-pandemic level, and the second lockdown had no such significant impact. Potential reasons for the quick response may be, on the one hand, a higher resilience of students in a dynamic labor market, e.g. due to a high level of flexibility (job changes), and, on the other hand, differences in labor market restrictions in the two lockdowns.[24] The majority of students who worked in a closed branch during the first lockdown appear to have moved to a non-closed branch.[25] A change in marginal employment is much easier than in regular employment, regarding application and job finding.

[23] Only students from non-academic backgrounds updated their BAfoeG funding (5%) and applied for the interest-free student loan described above (2%). Both educational groups used the non-repayable grants in phase 4 at the same rate (3% each).

[24] Comparable to our results, the unemployment rate peaked in April 2020 and approached pre-pandemic levels by the end of that year (see e.g. Gallant et al, 2020; Hershbein and Holzer, 2021).

[25] Unfortunately, due to small numbers of observations, we cannot provide a detailed analysis of job changes, but depict some tendency. Of the employed students in the pre-pandemic phase, only 61 provided information on a new job: 32 worked in a closed branch in the pre-pandemic phase. Of these, 30 students (and thus, almost all) moved to new employment that was not closed during the first lockdown.

Students' monthly expenses also experienced a short-term temporary decline during the first lockdown. Since they did not/could not change their major cost for housing, e.g. by moving back to the parents' home, they saved on living and leisure (see Appendix Table A.5). Spending on leisure remained below pre-pandemic baseline levels until the second lockdown, which may reflect a worsened quality of life.

The sudden restart of the economy across all sectors in the summer of 2021 (after the long second lockdown) massively increased labor demand. The rising employment rate of students mirrors this development (see Appendix Table A.4). In addition, students expected increases in expenses (see Appendix Table A.5), which may also have led to higher labor demand in the future.

Our results show that the decline in income during the first lockdown was mainly due to decreasing earnings. With respect to educational background, clear differences in the effects of the pandemic become apparent. The group of students from non-academic backgrounds, who are hit harder in terms of their job income during the second lockdown, are increasingly trying to compensate for this through loan financing, as parental support appears to be at its limit. They further do not expect an increase in total income. In contrast, students from academic backgrounds expect both parental support and their job income to increase. Thus, only this group of students can respond properly to rising prices (e.g., for housing, see Appendix Table A.5) after the two lockdowns and in the future.

Our findings are therefore in stark contrast to the general labor market situation: while income inequality in Germany seems to have generally declined in times of the pandemic (Dany-Knedlik and Kriwoluzky, 2021), we show that inequality continues to worsen for students from non-academic backgrounds. The increasing use of loan financing by students from non-academic backgrounds may result in repayment liabilities in the future, which will further foster this inequality. The development of the pandemic appears to have affected female students and

students from non-academic backgrounds more strongly; thus, the results are consistent with expectations (Aucejo et al., 2020; Doolan et al., 2021; Farnell et al., 2021; Jaeger et al., 2021).

6.2 Potential Impact on Studies

The changed individual income composition across socio-economic groups in face of a more or less constant level of spending may likely affect study progress. Previous research shows that changes in students' financial situations can have an impact on their studies, e.g. changes in financial aid programs (see e.g. Carruthers and Özek, 2016; Chen and DesJardins, 2010; Glocker, 2011) or changes in tuition fees (see e.g. Beneito et al., 2018). Recent research indicates that the pandemic led to delayed graduation (Aucejo, 2020), decreased academic performance (Rodríguez-Planas, 2021), and an increase in drop out intentions (Becker and Lörz, 2020; Belghith et al., 2020). However, both literatures have not been linked yet, i.e. whether the effects of the pandemic are actually related to the financial situation of students, remains unclear.

To analyze, in how far the financial impact of the pandemic translates into study decisions, we asked the students if they had thought about dropping out or extending their studies.[26] Due to financial concerns, more than 3% of the students have considered dropping out of their studies during the first lockdown (phase 2) and the relaxation phase (phase 3) (see Appendix Table A.15). During the second lockdown (phase 4), however, four times as many students (12%) were already considering dropping out. Although the dropout rate in Germany is in general higher for men than for women (Heublein and Schmelzer, 2018), the negative economic consequences of the pandemic in terms of dropout intention seem to have the same effect for both women and men. Our results show also similar effects by educational background in drop out

[26] We used a different sample for the analysis of compensation effects. Here we consider all students with complete answers of the questionnaire regarding the relevant questions. Our questions orientate on Lörz et al. (2020).

intentions, although students from non-academic backgrounds are generally more likely to dropout (Isleib, 2019).

A second adaption possibility is the prolongation of studies, which is relatively easy in a tuition-free system like in Germany. During the first lockdown (phase 2), about 17% of students thought about extending their studies due to financial concerns (see Appendix Table A.16) but lowered to about 8% during the relaxation phase (phase 3). During the second lockdown (phase 4), already 25% of students considered extending their studies. There are no consistent differences by gender or educational background between the phases.

However, our results refer to intentions only, and not to actual compensation effects.[27] If the compensation effects (dropout and extension) result in actual changes, the economic impact of the pandemic will widen the educational inequality described. Dropping out of university implies large sunk cost of study. If students extend their studies, this is associated with increasing costs (direct and opportunity costs). The higher share of loan financing among students from non-academic backgrounds results in higher education costs, which will negatively affect their cost-benefit considerations on prospective further higher education. The extension of studies and higher required repayment obligations imply also a lower available wage income later in the labor market.

Since there are countries in Europe where social educational inequality is lower than in Germany (Hauschildt et al., 2021), the goal of political measures has to be to reduce educational inequality. The government should learn from the negative impact of the pandemic on educational inequality in higher education (Hauschildt et al., 2021) and follow the goal of the Rome Ministerial Communiqué (2020) to improve the social dimension of higher education. For this

[27] We did not find any increase in actual dropout rates (until summer semester 2021) (see Appendix Table A.3). Furthermore, we cannot detect changes in enrollment in tertiary education but examination of enrollment numbers at Leibniz University Hannover is problematic due to the lack of a high school graduating cohort in 2020. The federal state of Lower Saxony prolonged upper secondary high school education from 8 to 9 years, leading to a "missing" high school graduation cohort in that year.

purpose, a set of policy measures should be considered, e.g. public financial aid systems for need-based students may be adjusted in order to and make higher education affordable for all students, to promote access to higher education, and to provide opportunities for students to succeed in their studies. Increased participation in higher education by underrepresented groups leads to broader benefits in terms of lower welfare payments, better health outcomes, and greater community involvement (EHEA, 2020b).

7 Conclusion

We conducted an online survey at a major German university to investigate the effects of the different phases of the COVID-19 pandemic on students' financial situation. Our results show that the pandemic (due to the closing of university and the loss of many student jobs) affected students stronger than the regular employees in the labor market. Since dependence on work differs clearly by socio-economic status, our results further depict some notable effect heterogeneity.

Female students and students from non-academic backgrounds suffered particularly from the pandemic. In contrast to that, the financial situation of students from academic backgrounds seems to have relaxed or even improved after the end of the second lockdown (due to intensified support from parents) compared to the situation before the pandemic. The situation of students from non-academic backgrounds has worsened significantly at the same time. These findings imply a widening of existing educational inequalities across different socio-economic groups.

There seem to be adverse effects on study progress – or at least study perspectives – due to the pandemic. Our results show increasing intentions to drop out or to extend studies due to financial concerns with the duration of the pandemic. However, it is too early to finally analyze whether these intentions will lead to action. In addition to compensation effects, the mobility of students (in terms of moving and studying abroad) also needs to be examined more closely.

Our evaluation of the impact of the pandemic considers only economic factors, such as employment and income. Therefore, no conclusions can be made as to whether online study (in terms of functionality, quality, flexibility and accessibility) is responsible for a worse/comparable/better continuation of studies (see e.g. De Paola et al., 2022). We also have no evidence about changed time budgets in the course of this. The timely and transparent communication of the government as well as the Leibniz University Hannover may also had an impact in terms of plannability (under the circumstances) and reliability. Since we specifically asked students about the impact of financial concerns with respect to the compensation effects, we assume that the switch to online study does not bias our results.

From our estimates, we expect the pandemic to widen educational inequities further through the financial impact of the pandemic. However, it remains to be seen how these inequalities will affect current social structures in the short- and medium-term. In any case, more consistent government intervention is advised to prevent inequalities from widening, and to reduce existing financial and educational inequalities. It is also unclear to what extent the different phases have psychosocial consequences as well as consequences on mental health. These aspects need to be answered in further research. Nevertheless, it is still uncertain what further consequences the worsening of inequalities in education as a result of the pandemic will have in the short- and medium-term, particularly with regard to the transition into higher education. In the long run, the question arises whether economic losses also change social inequalities in transition rates to university, or whether there are other consequences in terms of study duration, study success, student mobility or the choice of study field, or type of university. Since it is not yet clear when the pandemic will end, these long-term effects of the pandemic in particular need to be investigated in further research.

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Figures and Tables

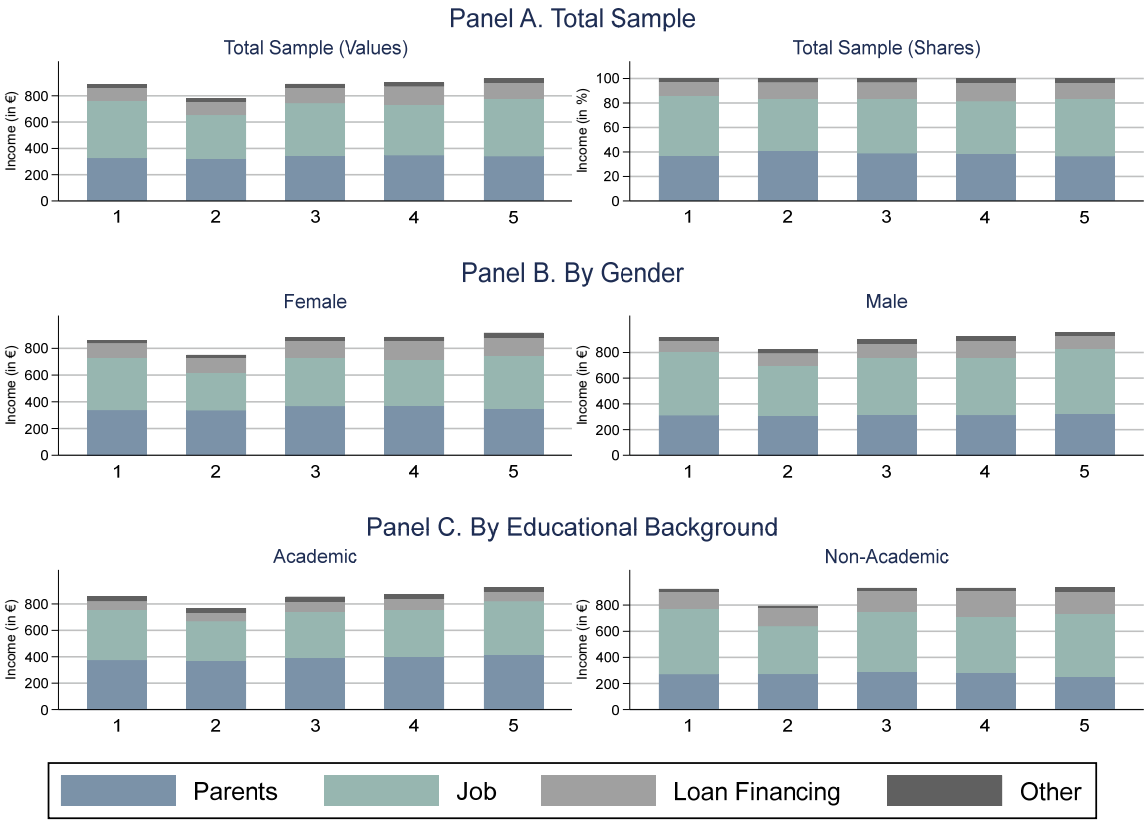

Fig. 1. Students' monthly income and funding composition by phase of the pandemic.
Notes: Panel A is the total sample with a set of 612 students. Panel B differentiates the total sample by gender into women (356) and men (256). Panel C differentiates the total sample by parental education background of the students into an academic (326) and a non-academic (286) educational background group. The academic background group includes students with at least one parent with a tertiary degree. See Appendix Table A.4 for corresponding descriptive statistics. Own calculations with data from the Leibniz University Hannover student survey, 2021.

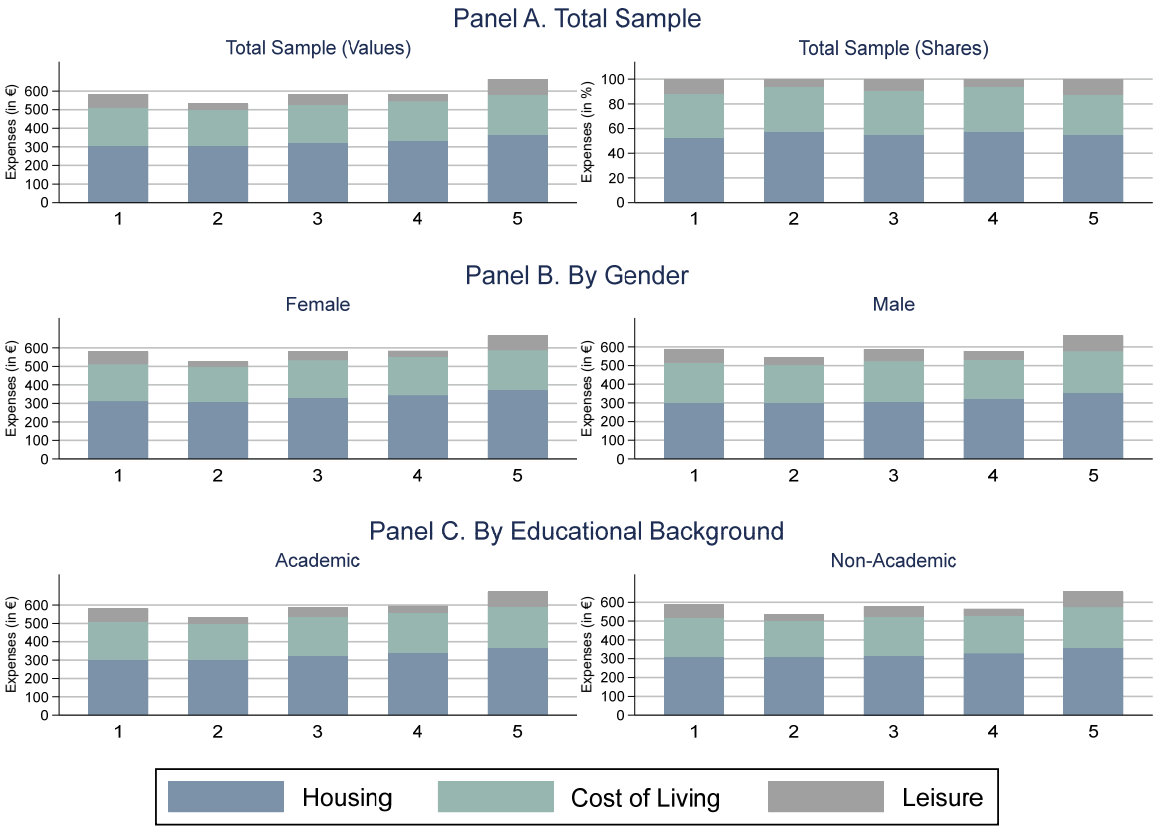

Fig. 2. Students' monthly expenses and composition by phase of the pandemic.
Notes: Panel A is the total sample with a set of 592 students. Panel B differentiates the total sample by gender into women (344) and men (248). Panel C differentiates the total sample by parental education background of the students into an academic (315) and a non-academic (277) educational background group. The academic background group includes students with at least one parent with a tertiary degree. See Appendix Table A.5 for corresponding descriptive statistics. Own calculations with data from the Leibniz University Hannover student survey, 2021.

Table 1
Change in income and its composition over the 5 phases (percentage changes).

	Total Income	Composition			
	(1)	(2)	(3)	(4)	(5)
	Income	Parents	Job	Loan Financing	Other
Phase 2 (First Lockdown)	-18.94***	5.13	-65.63***	4.81	-2.47
Phase 3 (Relaxation)	-3.54	5.87	-23.28**	19.36***	5.34*
Phase 4 (Second Lockdown)	-1.88	11.63	-33.97***	46.52***	5.65
Phase 5 (Expectation)	11.29***	19.96**	30.73**	32.05***	10.63
Observations	3,060	3,060	3,060	3,060	3,060
R^2	0.025	0.003	0.055	0.015	0.003
Mean (in €)	877.17	326.05	431.05	96.33	23.74

Notes: Shown are the β coefficients converted by $100 * (e^{\beta} - 1)\%$. Coefficients given as percentage change in income. The unconverted coefficients and standard errors are given in Appendix Table A.9. The constant α is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Mean income in phase 1. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2
Change in income over the 5 phases by gender and educational background (percentage changes).

	Gender		Educational Background	
	Female	Male	Academic	Non- Academic
	(2)	(3)	(4)	(5)
	Income	Income	Income	Income
Phase 2 (First Lockdown)	-19.35***	-18.37***	-16.89***	-21.26***
Phase 3 (Relaxation)	-2.76	-4.69	0.40	-7.96
Phase 4 (Second Lockdown)	-0.50	-3.63	-1.98	-1.69
Phase 5 (Expectation)	13.54**	8.22	14.22***	8.00
Observations	1,780	1,280	1,630	1,430
R^2	0.028	0.021	0.038	0.019
Mean (in €)	854.54	908.63	850.10	908.02

Notes: Shown are the γ coefficients converted by $100 * (e^{\gamma} - 1)\%$. Coefficients given as percentage change in income. The unconverted coefficients and standard errors are given in Appendix Table A.10. The constant ν is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Mean income in phase 1. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3
Composition of students' funding by gender (percentage changes).

	Female				Male			
	(1) Parents	(2) Job	(3) Loan Financing	(4) Other	(5) Parents	(6) Job	(7) Loan Financing	(8) Other
Phase 2 (First Lockdown)	3.15	-71.23***	1.82	0.00	7.79	-55.96***	9.20	-5.82
Phase 3 (Relaxation)	10.41	-25.70**	18.41**	5.44	0.00	-19.75	20.80*	5.13
Phase 4 (Second Lockdown)	23.12**	-40.61***	49.03***	6.61	-2.66	-23.51	43.05***	4.50
Phase 5 (Expectation)	28.92**	22.14	41.34***	24.61**	8.55	43.62*	20.32	-6.11
Observations	1,780	1,780	1,780	1,780	1,280	1,280	1,280	1,280
R^2	0.008	0.066	0.019	0.011	0.002	0.041	0.011	0.003
Mean (in €)	336.27	391.32	106.06	20.89	311.84	486.30	82.79	27.70

Notes: Shown are the γ coefficients converted by $100 * (e^{\gamma} - 1)\%$. Coefficients given as percentage change in income. The unconverted coefficients and standard errors are given in Appendix Table A.11. The constant ν is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Income in phase 1. Own calculations with data from the Leibniz University Hannover student survey, 2021. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 4
Composition of students' funding by educational background (percentage changes).

	Academic Background				Non-Academic Background			
	(1) Parents	(2) Job	(3) Loan Financing	(4) Other	(5) Parents	(6) Job	(7) Loan Financing	(8) Other
Phase 2 (First Lockdown)	1.82	-62.43***	3.05	1.82	8.98	-68.93***	6.93	-7.13*
Phase 3 (Relaxation)	10.85	-17.88	17.00**	8.87*	0.50	-28.89*	22.14**	1.41
Phase 4 (Second Lockdown)	19.24*	-22.89	21.90**	5.34	3.46	-44.68***	80.76***	6.08
Phase 5 (Expectation)	41.62***	49.93**	15.60	2.63	-0.70	11.74	53.88***	20.56*
Observations	1,630	1,630	1,630	1,630	1,430	1,430	1,430	1,430
R^2	0.014	0.055	0.007	0.001	0.001	0.056	0.025	0.011
Mean (in €)	375.56	379.12	64.98	30.44	269.62	490.24	132.06	16.10

Notes: Shown are the γ coefficients converted by $100 * (e^{\gamma} - 1)\%$. Coefficients given as percentage change in income. The unconverted coefficients and standard errors are given in Appendix Table A.12. The constant ν is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Income in phase 1. Own calculations with data from the Leibniz University Hannover student survey, 2021. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix

Table A.1
Summary statistics.

	N	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)
Female	612	0.58	0.49	0	1
Age	610	24.46	4.51	16	55
Migration	604	0.07	0.26	0	1
Academic Background	612	0.53	0.50	0	1
Vocational Training	609	0.19	0.39	0	1
Own Apartment	610	0.72	0.45	0	1
Semester	609	7.74	3.93	1	16
Dept. of Architecture and Landscape Sciences	612	0.08	0.27	0	1
Dept. of Civil Engineering and Geodetic Science	612	0.07	0.26	0	1
Dept. of Electrical Engineering and Computer Science	612	0.09	0.28	0	1
Dept. of Law	612	0.08	0.26	0	1
Dept. of Mechanical Engineering	612	0.09	0.28	0	1
Dept. of Mathematics and Physics	612	0.06	0.23	0	1
Dept. of Natural Sciences	612	0.15	0.35	0	1
Dept. of Humanities	612	0.26	0.43	0	1
Dept. of Economics and Management	612	0.10	0.30	0	1
Other Department	612	0.02	0.11	0	1

Notes: All variables are fixed for each individual and across the five phases and describe the condition in the pre-pandemic phase. Own calculations with data from the Leibniz University Hannover student survey, 2021.

Table A.2
Summary statistics in comparison to the population.

	N (Sample) (1)	Mean (Sample) (2)	Mean (LUH) (3)	Difference (1) – (2) (4)	Mean (Germany) (5)	Difference (1) – (4) (6)
Female	612	58.17%	40.93%	17.24***	49.00%	9.17***
International Students	612	4.41%	15.26%	-10.85***	11.10%	-6.69***
Age (Median)	610	24	21	3	23	1
First-Year Students	612	21.24%	28.24%	-7.00***	-	-
Bachelor	612	53.27%	60.15%	-6.88***	69.81%	-16.54***
Master	612	39.05%	31.67%	7.38***	20.32%	18.73***
University Degree	612	7.19%	7.53%	-0.33	9.87%	-2.68***
Observations			30,196	-	2,709,197	-

Notes: University degree including state certificate and excluding teaching degree, bachelor's and master's degree. Column (4) and (6) show the difference in means of column (2)-(3) respectively column (2)-(5) and the respective significance value from a difference in means test. Own calculations. Data in column (2) is taken from Leibniz University Hannover student survey, 2021. Type of degree without other and promotion. Data in column (3) is taken from LUH (2020). Data in column (5) is taken from Federal Statistical Office (2020). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3
Development of the number of students at the Leibniz University Hannover.

	Summer 2017	Winter 2017	Summer 2018	Winter 2018	Summer 2019	Winter 2019	Summer 2020	Winter 2020	Summer 2021	Winter 2021
New Enrollments	1,014	4,946	1,165	4,778	816	4,727	509	3,221	622	3,573
Total Amount of Students	26,093	28,695	27,101	29,692	28,151	30,207	28,141	29,439	27,287	28,817
From this (in %):										
Disease	0.22	0.14	0.15	0.15	0.26	0.15	0.21	0.19	0.30	-
Change of University	0.77	1.71	0.84	1.86	0.75	1.90	0.72	1.65	0.78	-
Dropout or Interruption	1.43	1.71	1.23	1.24	1.17	1.61	1.11	1.57	1.13	-

Notes: New enrollments are first enrollment in an institution of higher education. Due to the change in secondary school duration from eight to nine school years in Lower Saxony, there was a lack of a high school graduating class in 2020.

Table A.4
Use of the individual sources of financing.

	%	Mean	SD	Median	Min	Max
Total Income						
Phase 1 (Pre-Pandemic)	-	877.17	509.36	800	0	3,000
Phase 2 (First Lockdown)	-	771.76	486.65	730	0	2,600
Phase 3 (Relaxation)	-	881.27	590.10	800	0	3,100
Phase 4 (Second Lockdown)	-	891.23	553.93	813	0	3,800
Phase 5 (Expectation)	-	924.94	510.57	850	0	4,500
Parents						
Phase 1 (Pre-Pandemic)	73.69	326.05	313.86	250	0	1,500
Phase 2 (First Lockdown)	75.16	323.25	308.76	250	0	1,400
Phase 3 (Relaxation)	74.67	347.22	385.29	250	0	2,700
Phase 4 (Second Lockdown)	75.33	347.87	359.00	250	0	2,500
Phase 5 (Expectation)	76.96	341.90	339.87	250	0	2,000
Job						
Phase 1 (Pre-Pandemic)	71.73	431.05	514.13	378	0	3,000
Phase 2 (First Lockdown)	54.74	324.91	480.35	150	0	2,600
Phase 3 (Relaxation)	68.79	391.04	521.86	275	0	3,000
Phase 4 (Second Lockdown)	65.68	378.46	484.23	275	0	2,800
Phase 5 (Expectation)	76.63	433.31	481.01	400	0	2,800
Loan Financing						
Phase 1 (Pre-Pandemic)	19.61	96.33	222.67	0	0	900
Phase 2 (First Lockdown)	20.26	100.80	225.91	0	0	900
Phase 3 (Relaxation)	22.39	116.33	253.54	0	0	1,691
Phase 4 (Second Lockdown)	25.65	136.80	268.15	0	0	1,150
Phase 5 (Expectation)	24.18	118.99	243.75	0	0	1,350
Other						
Phase 1 (Pre-Pandemic)	8.50	23.74	89.96	0	0	600
Phase 2 (First Lockdown)	8.01	22.80	88.60	0	0	600
Phase 3 (Relaxation)	9.48	26.68	96.45	0	0	600
Phase 4 (Second Lockdown)	9.48	28.10	102.24	0	0	706
Phase 5 (Expectation)	10.13	30.74	105.75	0	0	650

Notes: % given as a share of total observations (N=612). Mean, SD, Median, Min and Max given in Euro. Own calculations with data from the Leibniz University Hannover student survey, 2021.

Table A.5
Expenses of the individual positions.

	%	Mean	SD	Median	Min	Max
Total Expenses						
Phase 1 (Pre-Pandemic)	-	583.73	322.46	599	0	2,010
Phase 2 (First Lockdown)	-	532.20	311.56	550	0	1,850
Phase 3 (Relaxation)	-	583.53	325.64	588	0	2,090
Phase 4 (Second Lockdown)	-	581.83	367.66	578	0	2,700
Phase 5 (Expectation)	-	664.73	323.62	650	0	2,300
Housing						
Phase 1 (Pre-Pandemic)	75.84	307.17	225.53	345	0	1,100
Phase 2 (First Lockdown)	75.68	307.71	226.25	348	0	1,100
Phase 3 (Relaxation)	78.04	320.91	231.09	350	0	1,200
Phase 4 (Second Lockdown)	79.90	334.77	250.11	350	0	1,500
Phase 5 (Expectation)	85.64	364.26	225.24	360	0	1,200
Cost of living						
Phase 1 (Pre-Pandemic)	95.44	206.30	125.28	200	0	650
Phase 2 (First Lockdown)	94.09	190.94	122.76	200	0	600
Phase 3 (Relaxation)	95.27	207.90	131.21	200	0	800
Phase 4 (Second Lockdown)	94.59	210.70	151.44	200	0	1,000
Phase 5 (Expectation)	97.80	218.75	115.04	200	0	600
Leisure						
Phase 1 (Pre-Pandemic)	80.57	70.26	68.49	50	0	360
Phase 2 (First Lockdown)	54.05	33.55	54.02	10	0	300
Phase 3 (Relaxation)	71.62	54.73	69.52	30	0	400
Phase 4 (Second Lockdown)	56.42	36.36	55.32	10	0	300
Phase 5 (Expectation)	87.67	81.72	78.40	50	0	500

Notes: % given as a share of total observations (N=592). Mean, SD, Median, Min and Max given in Euro. Excluding other expenses. Own calculations with data from the Leibniz University Hannover student survey, 2021.

Table A.6
Use of the individual sources of financing by gender in phase 1.

	% Women (1)	% Men (2)	Difference (1) – (2) (3)	Mean Women (4)	Mean Men (5)	Difference (4) – (5) (6)
Total Income	-	-	-	854.54	908.63	-54.09*
Parents	75.00	71.88	3.13	336.27	311.84	24.42
Job	72.47	70.70	1.77	391.32	486.30	-94.98**
Loan Financing	21.91	16.41	5.5**	106.06	82.79	23.28
Other	7.87	9.38	-1.51	20.89	27.70	-6.80

Notes: % given as a share of total observations (N=612, women: 356, men: 256). Mean given in Euro. Column (3) and (6) show the difference in means of column (1)-(2) respectively column (4)-(5) and the respective significance value from a difference in means test. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.7
Use of the individual sources of financing by educational background in phase 1.

	% Non-Academic (1)	% Academic (2)	Difference (1) – (2) (3)	Mean Non-Academic (4)	Mean Academic (5)	Difference (4) – (5) (6)
Total Income	-	-	-	908.02	850.10	57.92*
Parents	67.13	79.45	12.31***	269.62	375.56	-105.93***
Job	74.48	69.33	5.15*	490.24	379.12	111.12***
Loan Financing	26.22	13.80	12.42***	132.06	64.98	67.08***
Other	6.64	10.12	3.48**	16.10	30.44	-14.34**

Notes: % given as a share of total observations (N=612, non-academic: 286, academic: 326). Mean given in Euro. Column (3) and (6) show the difference in means of column (1)-(2) respectively column (4)-(5) and the respective significance value from a difference in means test. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.8
Negative consequences on the job of employed students.

	Dismissal		Unpaid Leave		Reduced Working Time		None	
	Quantity (1)	% (2)	Quantity (3)	% (4)	Quantity (5)	% (6)	Quantity (7)	% (8)
Phase 2 (First Lockdown)	60	13.92	81	18.79	77	17.87	213	49.42
Phase 3 (Relaxation)	38	9.20	17	4.12	99	23.97	259	62.71
Phase 4 (Second Lockdown)	39	9.44	51	12.35	51	12.35	271	65.86

Notes: N = 413. Own calculations with data from the Leibniz University Hannover student survey, 2021.

Table A.9
Change in income and its composition over the 5 phases.

	Total Income	Composition			
	(1)	(2)	(3)	(4)	(5)
	Income	Parents	Job	Loan Financing	Other
Phase 2 (First Lockdown)	-0.21***	0.05	-1.07***	0.05	-0.03
	(0.04)	(0.04)	(0.11)	(0.05)	(0.02)
Phase 3 (Relaxation)	-0.04	0.06	-0.26**	0.18***	0.05*
	(0.04)	(0.06)	(0.11)	(0.06)	(0.03)
Phase 4 (Second Lockdown)	-0.02	0.11	-0.42***	0.38***	0.06
	(0.05)	(0.08)	(0.14)	(0.08)	(0.04)
Phase 5 (Expectation)	0.11***	0.18**	0.27**	0.28***	0.10
	(0.04)	(0.09)	(0.12)	(0.09)	(0.07)
Observations	3,060	3,060	3,060	3,060	3,060
R^2	0.025	0.003	0.055	0.015	0.003
Mean (in €)	877.17	326.05	431.05	96.33	23.74

Notes: The constant α is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Mean income in phase 1. Robust standard errors (clustered by individuals) in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.10
Change in income over the 5 phases by gender and educational background.

	Gender		Educational Background	
	Female	Male	Academic	Non-Academic
	(2)	(3)	(4)	(5)
	Income	Income	Income	Income
Phase 2 (First Lockdown)	-0.22***	-0.20***	-0.19***	-0.24***
	(0.05)	(0.06)	(0.04)	(0.06)
Phase 3 (Relaxation)	-0.03	-0.05	0.00	-0.08
	(0.06)	(0.05)	(0.04)	(0.08)
Phase 4 (Second Lockdown)	-0.01	-0.04	-0.02	-0.02
	(0.06)	(0.07)	(0.05)	(0.07)
Phase 5 (Expectation)	0.13**	0.08	0.13***	0.08
	(0.05)	(0.06)	(0.04)	(0.07)
Observations	1,780	1,280	1,630	1,430
R^2	0.028	0.021	0.038	0.019
Mean (in €)	854.54	908.63	850.10	908.02

Notes: The constant ν is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Income in phase 1. Robust standard errors (clustered by individuals) in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.11
Composition of students' funding by gender.

	Female				Male			
	(1) Parents	(2) Job	(3) Loan Financing	(4) Other	(5) Parents	(6) Job	(7) Loan Financing	(8) Other
Phase 2	0.03	-1.25***	0.02	0.00	0.08	-0.82***	0.09	-0.06
(First Lockdown)	(0.06)	(0.15)	(0.06)	(0.02)	(0.07)	(0.16)	(0.07)	(0.05)
Phase 3	0.10	-0.30**	0.17**	0.05	-0.00	-0.22	0.19*	0.05
(Relaxation)	(0.08)	(0.14)	(0.08)	(0.04)	(0.09)	(0.17)	(0.10)	(0.06)
Phase 4	0.21**	-0.52***	0.40***	0.06	-0.03	-0.27	0.36***	0.04
(Second Lockdown)	(0.10)	(0.18)	(0.11)	(0.05)	(0.13)	(0.21)	(0.12)	(0.08)
Phase 5	0.25**	0.20	0.35***	0.22**	0.08	0.36*	0.18	-0.06
(Expectation)	(0.12)	(0.17)	(0.12)	(0.09)	(0.12)	(0.19)	(0.13)	(0.10)
Observations	1,780	1,780	1,780	1,780	1,280	1,280	1,280	1,280
R^2	0.008	0.066	0.019	0.011	0.002	0.041	0.011	0.003
Mean (in €)	336.27	391.32	106.06	20.89	311.84	486.30	82.79	27.70

Notes:. The constant ν is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Income in phase 1. Robust standard errors (clustered by individuals) in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.12
Composition of students' funding by educational background.

	Academic Background				Non-Academic Background			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Parents	Job	Loan	Other	Parents	Job	Loan	Other
			Financing				Financing	
Phase 2	0.02	-0.98***	0.03	0.02	0.09	-1.17***	0.07	-0.07*
(First Lockdown)	(0.05)	(0.15)	(0.05)	(0.03)	(0.07)	(0.16)	(0.09)	(0.04)
Phase 3	0.10	-0.20	0.16**	0.08*	0.00	-0.34*	0.20**	0.01
(Relaxation)	(0.07)	(0.14)	(0.08)	(0.05)	(0.10)	(0.17)	(0.10)	(0.04)
Phase 4	0.18*	-0.26	0.20**	0.05	0.03	-0.59***	0.59***	0.06
(Second Lockdown)	(0.10)	(0.20)	(0.09)	(0.06)	(0.12)	(0.19)	(0.14)	(0.07)
Phase 5	0.35***	0.41**	0.14	0.03	-0.01	0.11	0.43***	0.19*
(Expectation)	(0.12)	(0.17)	(0.10)	(0.09)	(0.13)	(0.18)	(0.15)	(0.10)
Observations	1,630	1,630	1,630	1,630	1,430	1,430	1,430	1,430
R^2	0.014	0.055	0.007	0.001	0.001	0.056	0.025	0.011
Mean (in €)	375.56	379.12	64.98	30.44	269.62	490.24	132.06	16.10

Notes: The constant ν is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Income in phase 1. Robust standard errors (clustered by individuals) in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.13
Robustness checks.

	Pooled OLS	Pooled OLS	LUH Weights
	(1)	(2)	(3)
	Income	Income	Income
Phase 2 (First Lockdown)	-0.21***	-0.21***	-0.19***
	(0.06)	(0.06)	(0.06)
Phase 3 (Relaxation)	-0.04	-0.03	-0.03
	(0.06)	(0.06)	(0.06)
Phase 4 (Second Lockdown)	-0.02	-0.02	-0.02
	(0.06)	(0.06)	(0.05)
Phase 5 (Expectation)	0.11*	0.11*	0.09*
	(0.06)	(0.06)	(0.05)
Female		-0.02	-0.01
		(0.04)	(0.04)
International Students		-0.07	-0.02
		(0.09)	(0.05)
Age		0.04***	0.03***
		(0.00)	(0.00)
First-Year Students		-0.03	-0.08**
		(0.04)	(0.04)
Degree		0.09***	0.14***
		(0.03)	(0.03)
Observations	3,050	3,040	3,040
Population			30,196
R^2	0.011	0.049	0.050

Notes: The constant α is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Coefficients given as change in income. Standard error in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.14
Robustness check: impact of negative consequences on income.

	Negative Consequences				No Negative Consequences			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Income	Parents	Job	Loan Financing	Total Income	Parents	Job	Loan Financing
Phase 2	-0.58***	0.19**	-2.88***	0.18**	-0.07	0.01	-0.35***	-0.08
(First Lockdown)	(0.08)	(0.10)	(0.20)	(0.09)	(0.05)	(0.05)	(0.12)	(0.06)
Phase 3	-0.32***	0.14	-1.52***	0.26**	-0.06	0.10	-0.39***	0.13
(Relaxation)	(0.06)	(0.11)	(0.17)	(0.11)	(0.06)	(0.10)	(0.14)	(0.10)
Phase 4	-0.41***	0.25*	-2.23***	0.50***	-0.04	0.24*	-0.77***	0.39***
(Second Lockdown)	(0.08)	(0.13)	(0.20)	(0.15)	(0.05)	(0.13)	(0.18)	(0.13)
Phase 5	-0.09*	0.27*	-0.92***	0.47***	0.00	0.16	-0.37**	0.28*
(Expectation)	(0.05)	(0.16)	(0.18)	(0.16)	(0.05)	(0.14)	(0.16)	(0.15)
Observations	1,080	1,080	1,080	1,080	1,065	1,065	1,065	1,065
R^2	0.08	0.01	0.22	0.02	0.00	0.01	0.03	0.02
Mean (in €)	936.80	312.52	508.10	93.01	1,048.86	303.72	634.84	88.18

Notes: Only students who were employed during the first lockdown. Negative consequences include dismissal, unpaid leave, and reduced work hours during the first lockdown. The constant is not shown. The coefficients refer to the mean value of income in phase 1 (pre-pandemic). Mean (in €): Income in phase 1. Robust standard errors (clustered by individuals) in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.15
Intention to drop out of studies due to financial concerns.

	Total	Gender		Educational Background	
		Female	Male	Academic	Non-Academic
	(1)	(2)	(3)	(4)	(5)
	Drop Out	Drop Out	Drop Out	Drop Out	Drop Out
Phase 2 (First Lockdown)	0.03***	0.03***	0.03***	0.03***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Phase 3 (Relaxation)	0.03***	0.04***	0.02**	0.03***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Phase 4 (Second Lockdown)	0.12***	0.12***	0.12***	0.12***	0.13***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Observations	2,612	1,548	1,064	1,388	1,224
R^2	0.061	0.058	0.066	0.059	0.063

Notes: Coefficients given as change in intention to drop out of studies due to financial concerns. Reference is phase 1 (pre-pandemic). Robust standard errors (clustered by individuals) in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.16
Intention to extend studies due to financial concerns.

	Total	Gender		Educational Background	
		Female	Male	Academic	Non-Academic
	(1)	(2)	(3)	(4)	(5)
	Extend	Extend	Extend	Extend	Extend
Phase 2 (First Lockdown)	0.17***	0.15***	0.20***	0.16***	0.18***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Phase 3 (Relaxation)	0.08***	0.07***	0.08***	0.08***	0.07***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Phase 4 (Second Lockdown)	0.26***	0.27***	0.24***	0.24***	0.28***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)
Observations	2,612	1,548	1,064	1,388	1,224
R^2	0.098	0.108	0.091	0.087	0.112

Notes: Coefficients given as change in intention to extend studies due to financial concerns. Reference is phase 1 (pre-pandemic). Robust standard errors (clustered by individuals) in parentheses. Own calculations with data from the Leibniz University Hannover student survey, 2021. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.