

EFFECT OF ENVIRONMENTAL CRISES ON THE STRESS LEVEL AND FINANCIAL BEHAVIOUR OF UNIVERSITY STUDENTS

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ABSTRACT

In my study, I analyze the impact of a coronavirus pandemic on student stress and financial behavior among university students in three countries. I also interviewed my questionnaire before and after the first wave, on a student sample of roughly one thousand five hundred in both years. The responses were processed using statistical methods, regression and path models. My results show that the pandemic increases the stress level of the students and, in turn, also changes their financial behavior. However, the extent of the change is determined by the direction in which the student is studying. More financial knowledge of economics students can, on the one hand, protect against bad financial decisions, and it also makes obvious the dangers lurking for students, thus enhancing the experience of stress. All this highlights the importance of acquiring the right knowledge, for which the last organized educational opportunity is higher education.

KEYWORDS

stress, financial behavior, university students, COVID-19, economic crisis

INTRODUCTION

The history of the world economy can also be described as a history of crises. Only in the last century have several crises shaken the world. The end result of the 1929 world crisis was World War II, and the oil price explosion of the 1970s also caused global problems. The bursting of the financial bubble in 2008 and the incredible size of the stock of overdue loans pushed back the development of the world economy for several years. Unlike the previous ones, the crisis caused by COVID-19, which attacks human capital itself, people, and stopped production and consumption due to forced short-circuit restrictions. While the negative effects of crises are obvious, all crises are also opportunities. New ways of resolving the global recession have always had to be sought and found (paradigm shift). This is also the case with the crisis caused by COVID-19. Since the outbreak of the epidemic, countless pieces of information have been gathered, all of which are paving the way for a new economic approach. This study also seeks to contribute to this with its modest means.

LITERATURE REVIEW

The new coronavirus pandemic in 2020 caused a global halt in the world economy. Prior to the advent of vaccines, a radical reduction in interpersonal contacts was the only protection against the spread of infection. The level of this is indicated by the fact that the governments of the affected states have ordered curfew restrictions, mandatory mask wearing, and frequent

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hand disinfection. Decreased physical activity led to a deterioration in quality of life [39]. Thus, short-term measures also contributed to the emergence and frequency of negative emotions, anxiety and stress. [27]. Forced confinement upset the balance of the body's internal environment (homeostasis) and altered hormonal conditions led to sleep disturbances, loneliness and anxiety [37].

Starting a university degree is always a major change in students' lives: daily examinations are replaced by periodic reports, grades are taken on semester and year-end exams, and many move away from home and family for the first time when they move into college or apartment. These changes in themselves cause such a serious mental strain that a significant proportion of students find it difficult or impossible to cope. nearly half of them drop out by the end of the first year [8]. Online education and restrictions have had a further significant impact on university students. The sudden shift to exclusive e-learning teaching methods has caused anxiety and depressive symptoms in a significant proportion of students due to the different workload required for distance learning [11].

Numerous studies have been conducted on the subject, for example with Italian [22], Hong Kong [7] or Polish [27] students. Psychiatric disorders among the population occurred in nearly a quarter of college students. these problems have been accompanied by increased use of social media, which is mainly of a compensatory nature, trying to break the confinement [6]. Based on an online questionnaire survey among U.S. university students [38], more than three-quarters of students reported an increase in their stress levels. According to a study of Chinese college students [5], financial problems, learning difficulties, anxiety about forced changes in daily living, and a lack of effective social support stand out among the factors influencing the level of stress caused by COVID-19. Other factors mentioned in the literature include dropping out of university (introduction of online education) and fear of infection [41]. Other studies [31] revealed similar factors that occurred in 80–90 percent of students surveyed. Excessive stress often causes mental problems.

According to a questionnaire survey by Best Colleges [10], 95% of students are involved, and half of the students concerned also report that stress has a direct effect on their learning outcomes. They have a harder time attending online classes and are also less successful with their assignments. The role of stress is also important because the younger age group is less at risk from the infection itself. For almost half of the students, isolation is the main problem. More than 40 percent report increased anxiety, sleep and eating disorders, and inability to relax. One-third of those surveyed feel hopeless about their situation. As compensation, 56 percent of them spend most of their time at the computer, with 46 percent almost never leaving the apartment. At the same time, nearly the same number sought a hobby for themselves or went hiking, playing sports or walking a dog more often. Every second respondent longs for romantic or friendly encounters, events, or just complete independence.

As the entire family was at home due to the short-term measures, tensions within the family increased in one-third of the families. One in five students reported that a family member or friend died in the epidemic. Dennon [10] also reports that they expected support primarily from their friends, according to two-thirds of respondents. Second place among supporters is family and kinship, followed by roommates. Half of the respondents answered yes to the question of whether stress also caused mental symptoms in her. First-year students and women are more at risk, with 60 percent of them experiencing symptoms.

Stress is usually measured by one of four methods: physiological excitement; based on life events, daily worries, or symptom lists. The methods used in stress questionnaires do not provide an overview of students' everyday sources of stress that contribute to the development of anxiety. The University Stress Scale (USS) is a psychometrically based measure of both the areas of stress experienced by university students and its extent. It is suitable for rapid screen-

ing and indicates the need for short therapy or counseling [33]. Commuting students are basically more stressed than other students. Their performance is measured by a study [42] on the effectiveness of self-directed learning, finding that the number of credits earned by the end of the first year is a better indicator than the study average.

Work has also been done to examine the level of student stress [16]. Their results show that more independent students are less at risk from stress and confinement, while those who are just learning are more exposed to negative effects. Other studies report that there are students who have been positively impacted by online education and graduations [15]. Examining such students can reveal opportunities that can be used to support students with mental disorders.

COVID-19 was a global humanitarian challenge. On the one hand, deaths due to illness and, on the other hand, declining incomes due to job losses are causing serious problems in many households. That is, COVID-19 poses a threat not only to physical and mental health, but also to the financial security of students - and everyone else. Therefore, the importance of financial literacy and the need to educate them has increased. Acquiring the right knowledge will increase protection against the financial consequences of the epidemic [1]. Tasks related to this also have management implications. There is a need for financial literacy programs that provide investment advice and suggestions that can be used directly in practice and also help to make individuals more aware of both the knowledge and skills they have acquired since the COVID-19 crisis [1]. Thus, protection for the future can also be strengthened and hitherto generally reactive responses can be made proactive in similar situations. Financial literacy is made up of three components into one unit: financial literacy (knowledge), financial behavior, and relationship to finance (attitude) [18]. The role of financial literacy is paramount, as knowledge also fundamentally determines financial behavior, both directly and indirectly, through financial attitudes [2]. Today's generation of young people has already grown up in a consumer perspective, so its members are also consumer-oriented. The concept of financial literacy refers to the knowledge-based understanding and effective use of a variety of financial skills that enable short- and long-term personal financial decisions to be made effectively [12; 25; 26; 36]. It is also linked to everyday financial decisions through the convergence of financial, credit and debt management [17]. In addition, financial literacy includes an understanding of everyday situations such as insurance, credit, and the role of savings and loans [28].

Recent decades have seen an appreciation of financial literacy. While previous decades have been characterized by cash settlement of goods and services, not only the use of bank and credit cards and online shopping, but also the proliferation of mortgages and various insurance and investment schemes has become commonplace. Managing these definitely requires financial knowledge to be defined later. The OECD Financial Questionnaire [18] groups the concept of financial behavior into three aspects: long-term savings, conscious shopping, cash flow, and tracking of financial transactions. The ability to save is also a component of financial behavior. Savings help smooth the waves of finances, smooth out spending, and lay the foundation for financial resilience and help an individual achieve their financial goals. Savings are good indicators of financial awareness, but when using them in this way, it is important to note that it is not the existence of a bank or current account or the stock of savings that is important, as it can come from elsewhere (inheritance, winnings, rewards) but the ability to save. .

When examining the impact of a coronavirus pandemic on the financial behavior of university students, the baseline situation must first be determined. Therefore, in the following, I review the literature on financial literacy of students in the countries examined in this study. According to the latest Austrian financial literacy survey conducted by the OECD [9], Austria's performance is above the declining OECD average for general financial literacy over the same

period and, unlike Hungary, this good performance is not due to higher financial literacy but rather to favorable due to behavioral score. Another important finding of the research is that there is a strong link between financial literacy education and better financial literacy and more favorable financial behavior. The financial literacy of Austrian respondents reached 4.9 points out of a possible seven in 2018, this score increased to 5.3 by 2020. Among the components of financial literacy, the highest score, six out of a possible nine, was achieved in the area of financial behavior. Looking at the time series of the surveys, it can also be seen that Austria continues to perform well, mainly due to its above-average financial behavior score. The overall picture shows that Austrians are quite prudent, risk-averse, well-designed and well-understood [13]. However, the above favorable picture is significantly nuanced by the fact that young adults, including university students, are the least financially conscious in Austria [40]. They think much less before a purchase whether they can do it or not than other age groups. Similarly, they are less willing to track spending or develop alternative habits, such as separating money for bills from daily spending or tracking bills (although they are likely to have lower incomes than older age groups).

After 2010 and 2015, Hungary participated in 2018 for the third time in an international comparative study of the financial awareness of the adult population (18-79 years old). On a positive note, our relative position has improved slightly since 2015 and the overall score is also close to the OECD average. However, in addition to the improving results, there is still a great need to target the financial approach, as the complex indicator measuring financial literacy is 12.3, which is only 60 percent of the maximum possible 21 points. Hungary achieved the best results in the category of financial knowledge. While Hungarians are not lagging behind other OECD member countries in terms of financial literacy, they underperform in terms of actual financial behavior, ie decision-making. As a result, however, the willingness to save has almost doubled, from 27 percent to 51 percent. Unfortunately, even so, it does not approach the OECD average of 70 percent. In terms of financial attitudes, however, the above-average result (66%) was achieved, with the best performance in terms of protection against financial fraud being provided by Hungarians, of whom only 0.9% fell victim, compared to the OECD average of 1.8%. In terms of finances, Hungary's performance is also better than Austria's and the OECD average. Unfortunately, however, this fact alone, without proper financial behavior, is not enough to put good performance into practice. Simply put, Hungarians have a higher level of financial knowledge, they prefer to deal with finances than Austrians, yet they cannot make better decisions and behave on financial issues than Austrian respondents.

A 2019 survey [19] also examined the financial literacy of a generation of Slovak university students on the tenth anniversary of the introduction of the Euro. The results obtained showed that the general financial knowledge of this generation does not reach that of the previous two generations. Another earlier survey study in 2016 measured the financial literacy of business high school students [4] approached the issue in terms of cash use and family savings and loans. Among his findings, it should be emphasized that the level of education is an important factor that significantly influences the propensity to become indebted, despite the fact that more educated people tend to keep loans in a reasonable balance relative to their income. It has been observed primarily among men that they are more likely to take out loans to meet their needs if the development of the level of demand is not in sync with the development of current income. This is particularly the case if the economy as a whole is on an upward trajectory, as this reduces the reality of risk assessment. A study on the financial culture of Slovak university students [21] deals with the analysis and evaluation of the current level of financial culture of students in university economics faculties. One of the most important results is that first-year students perform similarly to their peers in higher grades. As first-year students coming to university from business high schools that specifically provide economics training

performed worse than those coming from high school, the scope and quality of financial knowledge seems to depend more on the level of study at the university. Recent results [19] from a study of Czech and Slovak management students have shown that the knowledge of part-time students working alongside their studies is higher than that of their full-time peers. This is probably due to more of their practical experience.

METHODOLOGY

During the definition of the research strategy, I found the quantitative questionnaire survey to be a suitable method, so I examined what options are available to me. Nowadays, online questionnaires are becoming more and more popular. This is actually the only feasible procedure in a global pandemic. However, when I completed the first phase of the research in 2019, no one could have guessed what awaited the world in the near future. Therefore, I thoroughly examined the pros and cons of using online and offline questionnaires. Finally, with the aim of keeping the distortion effect to a minimum, I decided to develop an offline questionnaire [14; 43]. My choice ultimately proved to be the right one, as the time and energy devoted to properly defining the methodology paid off abundantly here. The questionnaire response rate was 92%, which was higher than the standard return rate of 20-40%, which was already a successful survey for online questionnaires [23; 34; 35].

The aim was to create a so-called self-completion questionnaire [20], which I piloted before finalization. My acquaintances, who asked their fellow students at their own university to respond, helped to distribute, re-collect, and return the questionnaires. As soon as the answers to the questionnaire arrived, I first imported them into a Microsoft Excel workbook and then cleaned and coded the data. This made them suitable for processing in SPSS Statistics software. Cleaning the database means checking the entire database. We need to look for missing values and take care to deal with them. The database can be cleaned manually, but in the present study I used the R program package and its graphical (R Studio) interface, which is able to read both Excel and SPSS files.

For the sake of statistical processability, I used only closed-ended questions in the questionnaire [24], with the exception of the question on age. In addition to demographic questions, my questionnaire included a total of 83 questions, which I grouped into the following groups:

- - 11 statements used to measure respondents' financial security,
- - A section consisting of 32 questions and statements compiled to measure financial literacy,
- - 15 questions and statements to examine financial attitudes,
- - 18 questions and statements to measure financial behavior,
- - A series of statements measuring the stress level of the respondents, which was included in the questionnaire based on the GAD stress questionnaire (7 questions).

The latter set of questions was the most important for the present work, because in this study I examine and describe the results related to the effects of stress.

The three groups of questions assessing knowledge, behavior and attitude were made partly on the basis of a review of the literature and partly from self-developed questions, with which I tried to cover the three areas to be examined as widely as possible. In all five cases, I created an index measuring the given trait using a simple arithmetic mean. The responses to the statements measuring financial well-being were fitted to a five-point Likert scale, so the two extreme values of the theoretical range of the index were one and five. The answers to the GAD7 stress questionnaire could be given on a four-point Likert scale, accordingly, the theoretical minimum of the index was one and the theoretical maximum was four. The value of

the three self-developed indexes could be between zero and one, as in most cases a yes-no answer was possible, where the answer corresponding to the index was one and the answer that did not correspond to it was zero points. If there were not only two possibilities for the answer, then I transformed the several answer possibilities so that the least corresponding to the index was zero, the most suitable one, and the others occupied a proportional space between the two extreme values. Finally, I obtained the indices by averaging these values. Of these, I present only the indices of stress and financial behavior in the present work.

The first group of questions, the demographic part [30], consisted of the usual questions in statistical surveys; thus, all available answers could be given in closed questions. In addition to the classical variables (gender, age, place of residence, education), I also included all other group-forming criteria (which country or university in which country you study, whether you are a full-time or part-time student, work in addition to your studies and, if so, - in what capacity). The second part, on financial habits, literacy, and activities, also contained exclusively closed questions. To answer these, I used a Likert scale [3], yes-no questions, and multiple choice questions [29]. During the processing of the questionnaire, I used regression models in addition to the methods of descriptive statistics (univariate and multivariate analyzes, comparison of means). The effects between the factors thus determined were then analyzed by making road models.

RESULTS

I begin by describing my results with a description of the sample. The questionnaire was completed by a total of 1,549 in 2019 and by 1,712 in 2020. I surveyed the same questionnaire in both years. Respondents were selected from a total of seven universities, one faculty from each of the seven universities, and a total of three majors. The seven universities and the three specializations were as follows (Figure 1):

- Economic program:
 - o Budapest Business School, Faculty of Finance and Accountancy (BGE-PSZK),
 - o Wirtschaftsuniversität Wien (WUW),
 - o Ekonomická Univerzita v Bratislave (EUB),
- Legal program
 - o Eötvös Loránd University, Faculty of Law (ELTE-ÁJK),
- Major in the field of humanities, pedagogy, or arts
 - o University of Pécs, Faculty of Humanities (PTE-BTK),
 - o Eszterházy Károly Catholic University, Faculty of Pedagogy (EKE-PK),
 - o Budapest Metropolitan University of Applied Sciences, Metropolitan Egyetem, Faculty of Arts and Creative Industries (METU-ART).

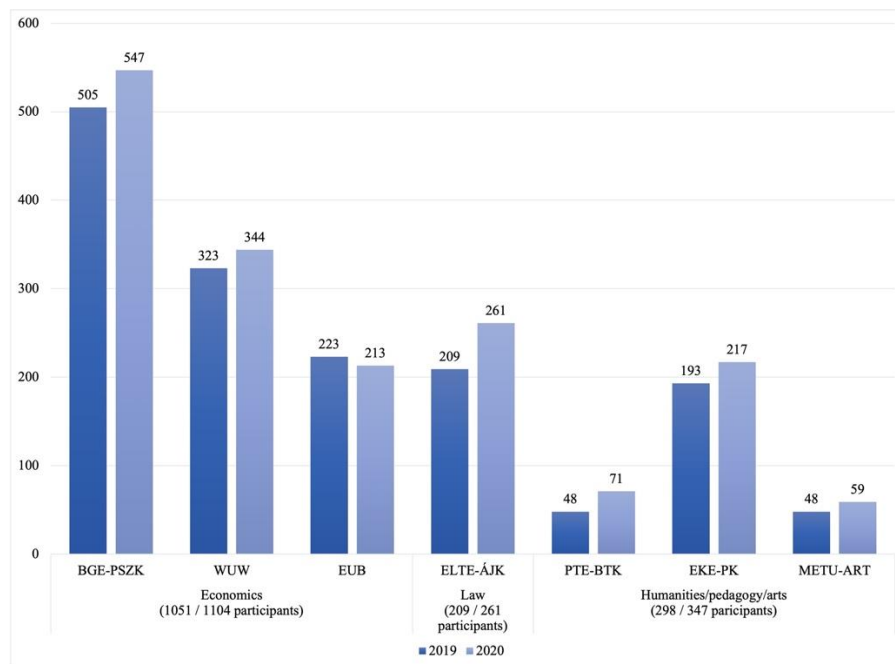


Figure 1: Participants of the research
Source: author's own elaboration

I found similar distributions by gender, place of residence, and age in the two queries. According to the study order, as in the universities, most of them were full-time students, the proportion of correspondents was about 20 percent. Most of the students surveyed are only studying at university and do not work alongside them (Figure 2). They were in 1,214 (78.4%) in 2019 and 1,373 (80.2%) in 2020 in the samples. Students who work in addition to their university studies are mostly engaged in intellectual activity, so they were also represented in the sample in a larger proportion: in 2019 256 people (16.5%), in 2020 255 people (14.9%). Roughly one in twenty students do physical work in addition to their studies: 79 in 2019 (5.1%) and 84 in 2020 (4.9%).

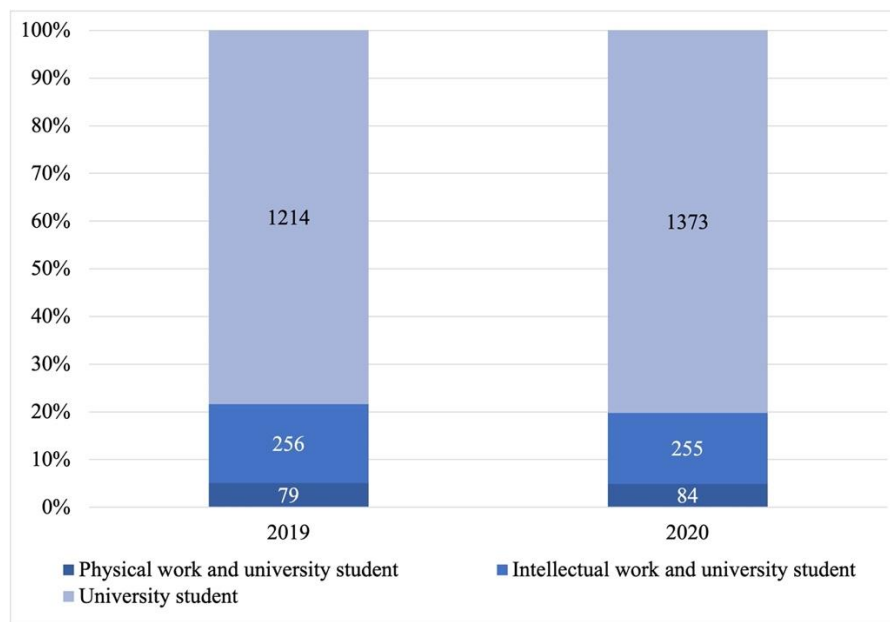


Figure 2: Distribution of sample according to work in addition to university studies
Source: author's own elaboration

Descriptive statistics for the two indices presented in the present study based on the questionnaire are shown in Table 1.

Table 1: Descriptive statistics of indices

Question	N	Minimum	Maximum	Average	St. dev.
Financial behaviour	3261	0.26	0.82	0.62	0.09
GAD7 – Stress	3261	1.00	4.00	2.31	0.61

Source: author's own elaboration

As the first step of my research, I analyzed the determining factors of indices with a linear model. Due to the size of the sample, I assumed its normality based on the central limit distribution theorem, therefore the tests were performed by the method of covariance analysis (ANCOVA). For each index examined, I set up a linear model that included, in the first step, all demographic variables and indices and their interaction with the year as the explanatory variable. After eliminating the non-significant variables, I finally used only the model in which all explanatory variables were significant in the further analysis. The only exception to this was if the interaction of two variables had a significant effect on the outcome variable, while the individual effect of the variables in the interaction was not significant; in this case, the non-significant individual variable was also included in the final model. The significance level was uniformly set at 5%. Among the linear models, I present an index of stress and financial behavior in this work.

Stress

My questionnaire included a set of questions that measure the stress level of the respondent, using a seven-statement GAD scale [32]. Respondents were required to declare each of the seven statements on a four-point Likert scale (1 = not at all, 2 = sometimes, 3 = often, 4 = always). The responses to the seven statements were averaged to give a scale from one to four with an average of 2.31 for all respondents. The model fitted to the stress level proved to be significant ($F(12; 3248) = 637.3; p < 0.001$) and its explanatory power was 70.19 percent. The

largest part of the total explanation is the effect of the year ($p < 0.001$), which alone explains 68.05 percent. The specialization ($\eta^2 = 0.0223$; $p < 0.001$) and its interaction with the time of the survey are also significant ($\eta^2 = 0.0089$; $p < 0.001$). The effect of the other variables is more theoretical due to the low magnitude of their effect, these are: marital status ($\eta^2 = 0.0005$; $p = 0.017$), as well as its interaction with the year ($\eta^2 = 0.0013$; $p = 0.038$) and financial knowledge ($\eta^2 = 0.0017$; $p = 0.019$).

The large difference between the 2019 and 2020 surveys shows that while in the previous survey people's stress levels were well below the theoretical average (1.79), in 2020 they were already above the theoretical average (2.79). This difference is of a similar magnitude for all three specializations we examined and is therefore significant. There was a significant difference between specializations only against students of humanities / pedagogy / arts majors (2.18): their average stress levels were significantly lower compared to both economists (2.33) and lawyers (2.35). This trend can also be observed over the two years (at Humanities/pedagogy/arts, economics, and law in 2019: 1.73; 1.78; and 1.86 respectively; in 2020: 2.64; 2.87; and 2.84 respectively), and it is even significant. The significant interaction stems from the fact that the stress level of law students (1.86) was, albeit slightly, higher in 2019 than that of economics students (1.78); which gap has disappeared by 2020, and although the average for law students has been lower (2.84) than for economics students (2.87), the difference is not significant (Tables 2-4 and Figure 3).

Table 2: Estimated marginal averages of stress level during the analyses according to study program

GAD7 – Stress	Study program	Economy	Law	Humanities/pedagogy/arts
Year	Group average	2.33	2.35	2.18
2019	1.79	1.78	1.86	1.73
2020	2.79	2.87	2.84	2.64

Source: author's own elaboration

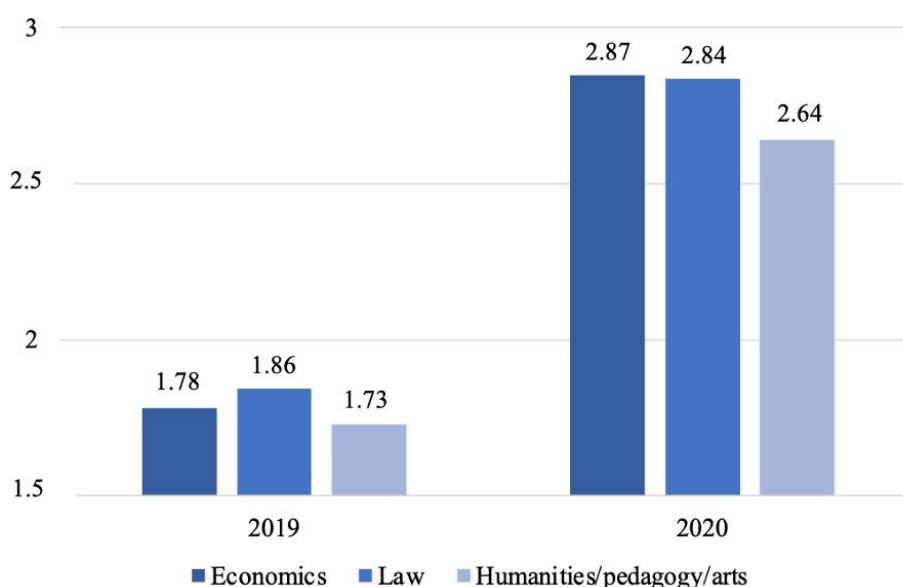


Figure 3: Estimated marginal averages of stress level at the two time points of the survey according to study program

Source: author's own elaboration

Table 3: Deviations between Estimated marginal averages of stress level at the two time points of the survey according to study program

Study program	Coefficient	2019	2020
Economy – Law	0.473	0.013	0.368
Economy – Humanities/pedagogy/arts	<0.001	0.073	<0.001
Law – Humanities/pedagogy/arts	<0.001	<0.001	<0.001

Source: author's own elaboration

Table4: Significance values of differences between the estimated marginal averages of stress level at the two time points of the survey according to study program

Year	Coefficient	Economy	Law	Humanities/pedagogy/arts
2019 – 2020	<0.001	<0.001	<0.001	<0.001

Source: author's own elaboration

The level of stress in the overall model is not significantly influenced by the country, however, given the importance of differences between countries, we examined whether there was a greater or lesser difference in the value of this variable for each country. There is a significant difference between Hungary (2.25) and the other two countries (AUT: 2.30; SVK: 2.31) in relation to the total sample. This difference did not exist in 2019, but by 2020 it will. This produced significant differences for the entire sample for both years. In 2020, the same relations could be observed, ie the Hungarians had the lowest stress level (2.73), and the Austrians (2.81) and the Slovaks (2.81) had significantly higher stress. (Tables 5-7 and Figure 4).

Table 5: Estimated marginal averages of stress level at the two time points of the survey according to countries

GAD7 – Stress	Country	HUN	AUT	SVK
Year	Group average	2.25	2.30	2.31
2019	1.79	1.78	1.78	1.81
2020	2.79	2.73	2.81	2.81

Source: author's own elaboration

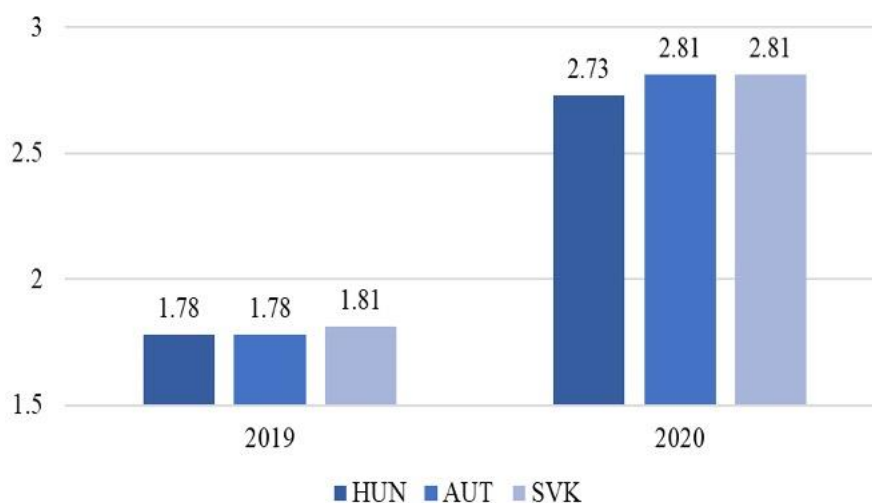


Figure 4: Estimated marginal averages of stress level at the two time points of the survey according to countries

Source: author's own elaboration

Table 6: Significance values of differences in the estimated marginal averages of stress level at the two time points of the survey according to countries

Study program	Coefficient	2019	2020
HUN – AUT	0.027	0.964	0.002
HUN – SVK	0.007	0.330	0.012
AUT – SVK	0.745	0.515	0.998

Source: author's own elaboration

The difference between the two years is significant in all three countries: roughly one point increase was observed from 2019 to 2020. That is, for students in all the countries studied, it can be said that the viral situation significantly increased the level of stress (Tables 5 and 7).

Table 7: Significance values of differences in the estimated marginal averages of stress level at the two time points of the survey according to countries

Year	Coefficient	HUN	AUT	SVK
2019 – 2020	<0.001	<0.001	<0.001	<0.001

Source: author's own elaboration

Marital status measured on a five-point scale also shows a significant correlation with stress levels, but this is only true for 2019. In the case of the two years, we observed a significantly different ($p = 0.008$) slope: in 2019 those with a closer private relationship reported a higher level of stress (0.0187), while in 2020 the slope index measuring the correlation was almost zero (-0.0004). The variable measuring financial literacy has a significant ($p = 0.009$) negative effect (-0.1828) on stress levels. That is, anyone with a broader, higher degree of financial knowledge is expected to have a lower level of stress (Tables 8-9). This can probably be explained by being aware of the dangers of financial decisions.

Table 8: Effect of quantitative variables in the model

Variable	Slope	St. error	t	Sig.
Marital status	0.0187	0.0071	2.640	0.008
Fin. knowledge	-0.1828	0.0704	-2.596	0.009

Source: author's own elaboration

Table 9: Effect of marital status on stress level at the two years of the survey

Year	Group average	Slope
2019	1.78	0.0187
2020	2.75	-0.0004

Source: author's own elaboration

Thus, the level of stress increased significantly from 2019 to 2020, as shown by the variable magnitude of the year in the model. This far exceeds the magnitude of the impact of all other variables, highlighting in particular the importance of the query year (before or during a pandemic). A survey of university students clearly showed a significant increase in stress in this social group compared to the year before the pandemic. Their stress levels, measured on a scale of 1 to 5, in 2019 were very close to the theoretical minimum of 1.78, which actually means that they almost did not perceive stress, only on an average everyday level. However, by 2020, this value has risen to 2.75, which is already very close to the theoretical center of the scale: three. This means that the previous usual degree of stress has increased significantly.

Other significant variables in the model convey the message that the effect of the other variables we examined is more symbolic and only slightly modifies the change from one year to the next. In the scope of humanities / pedagogy / arts students, there was a smaller increase in stress, i.e. students in this major may have better tolerated the difficulties associated with the viral situation. In 2019, closer marital status further increased stress levels, but by 2020, this effect has already disappeared. A higher level of financial literacy, on the other hand, can bring some peace of mind to a university student's life, as it has been shown that the higher a person's financial literacy, the less stress in their life. There is no significant difference between the three countries in 2019, but in 2020: the stress index of Hungarian students is lower than that of both Austrian and Slovak students.

Financial Behavior

I measured financial behavior using answers to 18 questions, where for yes-no questions, the yes answer received a point and the non-answer a score of zero. Where I asked about the frequency of an activity, the most common behavioral response was one point, never zero, and the others corresponded to a proportional value between the two extremes. The index of financial behavior was created as the average of the 18 responses, with a theoretical minimum of zero and a theoretical maximum of 1.

The average value of financial behavior is 0.62 (standard deviation: 0.09) and the explanatory power of the overall model is 18.99 percent. Financial knowledge ($\eta^2 = 0.0804$; $p < 0.001$) and students' work schedule ($\eta^2 = 0.0411$; $p < 0.001$) have the greatest impact. The effect of five other variables is also significant, however, the strength of these effects is negligible compared to the previous two: year of survey ($\eta^2 = 0.0007$; $p = 0.010$), specialization ($\eta^2 = 0.0056$; $p < 0.001$); stress ($\eta^2 = 0.0045$; $p = 0.641$); and the interaction of year and stress ($\eta^2 = 0.0015$; $p = 0.026$).

Compared to 2019 (0.63), financial behavior increased significantly ($p = 0.048$) by 2020 (0.64), however, the increase was small. A significant order can be established between the three examined groups of university specialties according to which students have the highest degree of financial behavior. Students of humanities / pedagogy / arts programs have the lowest average (0.63), followed by economics students (0.64) and law students (0.65). This trend was characteristic in both years, so no significant interaction was detected between the two variables (Tables 10-11 and Figure 5).

Table 10: Estimated marginal averages of financial behavior at the two time points of the survey according to study program

Financial behavior	Study program	Economy	Law	Humanities/pedagogy/arts
Year	Group average	0.64	0.65	0.63
2019	0.63	0.63	0.65	0.62
2020	0.64	0.64	0.65	0.63

Source: author's own elaboration

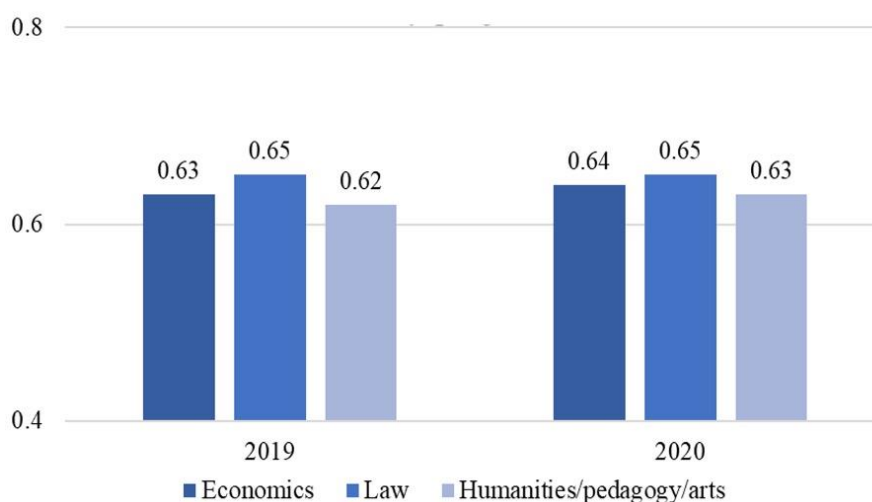


Figure 5: Estimated marginal averages of financial behavior at the two time points of the survey

Source: author's own elaboration

Table 11: Significance values of differences in the estimated marginal averages of financial behavior according to study programs

Study program	Coeff.
Economy – law	0.011
Economy – Humanities/pedagogy/arts	0.029
Law – Humanities/pedagogy/arts	<0.001

Source: author's own elaboration

There is a significant ($p < 0.001$) difference between the level of financial behavior of full-time (0.62) and correspondence (0.66) students. In the case of the latter, we measured a significantly higher value, which means that they become more active in several areas of financial life. The model included two quantitative variables, of which the independent effect of stress

was not significant ($p = 0.641$), however, the positive effect of financial knowledge (0.276) was yes ($p < 0.001$). This suggests that greater awareness is also reflected in actions in the area of finance. The financial behavior of such students also spans several areas. The stress index, on the other hand, had a significantly different effect on financial behavior in 2019 and 2020 ($p = 0.026$), its negative effect (-0.0218) appeared in 2020, ie the more stressful someone was, the more receding his financial behavior was. (Tables 12-13).

Table 12: Effect of quantitative variables in the model of financial behavior

Variable	Slope	St. error	t	Sig.
GAD7 – Stress	-0.003	0.007	-0.467	0.641
Financial knowledge	0.276	0.016	16.867	<0.001

Source: author's own elaboration

Table 13: The effect of the index of stress in the model of financial behavior in the two years of the survey

Year	Group average	Slope
2019	0,63	-0.0032
2020	0,64	-0.0218

Source: author's own elaboration

Overall, we can say that students with correspondence and / or higher financial knowledge are more active in financial behavior. That is, those with a higher degree of financial literacy have a broader financial behavior. This can even be a mutually reinforcing trend, it may not be possible to clearly define which is the cause and which is the cause. Stress has not yet had a negative effect on financial behavior in 2019, but in 2020, i.e., with increased stress, financial activity has declined. Of the three programs examined, law was the one in which students had the highest and humanities/pedagogy/arts were the ones where students had the lowest level of financial behavior. Students majoring in economics showed a level between the other two majors. Similar to financial literacy and financial attitudes, in contrast to stress and financial well-being, the two years compared show very few, albeit significant, differences: by 2020, the average level of financial behavior has increased somewhat. Overall, this draws attention to the fact that the negative impact of the viral situation has been primarily on stress and financial well-being, i.e., people have become more nervous, and their financial well-being has also suffered. In contrast, financial literacy (not surprisingly), attitudes, and behaviors changed almost imperceptibly from 2019 to 2020.

Structural Equation Model (SEM) – Countries

I mapped the correlation system of the dimensions I examined with the help of road analysis, among the variables in the present work I examined stress and financial behavior, and the correlations between the two, taking into account the year of the survey (ie. the impact of the pandemic). The latter was included in the model as a purely explanatory variable, financial behavior was the outcome variable, while COVID and stress occurred in both roles. (Figure 6). Based on the databases of the three countries, I set up a parallel structural model, so it became possible to compare how the correlations develop between the variables included in the model. I hypothesize that the viral situation had a significant effect on respondents' stress levels and, through this, on their financial behavior. The fit statistics of the resulting structural model (Table 14) are good, all indicators measuring it have a value above 0.9 (NFI = 0.959;

RFI = 0.905; IFI = 0.963; TLI = 0.912; CFI = 0.962), the mean square error of the fit is also adequate, Below 0.08 (RMSEA = 0.058; LO90 = 0.053; HI90 = 0.064). In model building, I kept in mind that the path could remain in the model if it was significant for at least one country and improved on fit statistics. The limit of significance was set at 5%, the value below this was classified as insignificant. From the relationships shown on the basis of these, I present the variables COVID, stress and financial behavior (Table 16 and Figure 7).

Table 14: Size, standardized size, and test statistics of direct effects in the road models of the analysed countries

Country	Effect	Coefficient	St. Coeff.	St. Error	t	Sig.
HUN	Stress ← COVID	0.928	0.781	0.023	41.255	<0.001
	Fin. behavior ← Stress	-0.016	-0.103	0.005	-3.123	0.002
AUT	Stress ← COVID	1.138	0.891	0.038	29.583	<0.001
	Fin. behavior ← Stress	-0.014	-0.120	0.009	-1.537	0.124
SVK	Stress ← COVID	1.022	0.787	0.047	21.555	<0.001
	Fin. behavior ← Stress	0.009	0.074	0.009	0.934	0.350

Source: author's own elaboration

Examining the direct effects, the impact of the pandemic on stress is clear. For all three countries, it can be shown that the stress levels of university students increased significantly from the pre-viral period to the post-first wave period. However, the pandemic only had a negative impact on financial behavior among Slovak university students: among them, it can be observed that their financial activity decreased as a result of the viral situation. The magnitude of the effect of stress does not differ in magnitude across the three countries. However, due to the sample size, only a significant effect can be detected among Hungarian students; this shows that stress restrains financial behavior.

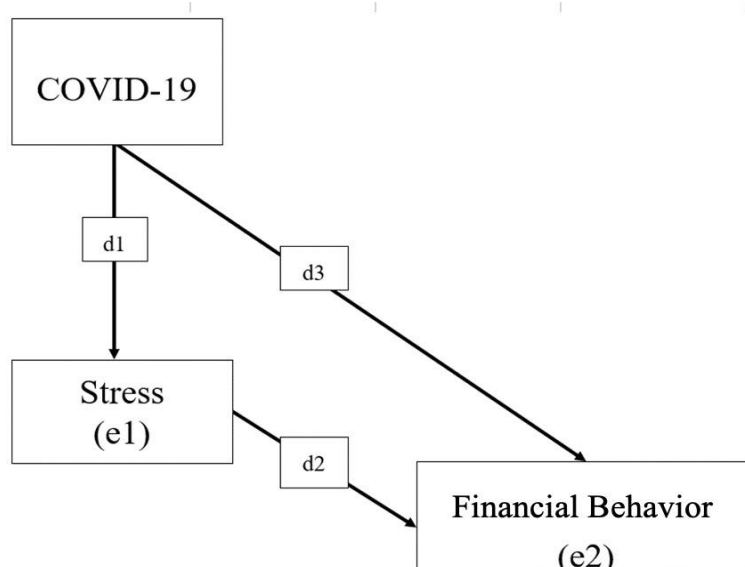


Figure 6: Map of SEM models of the examined countries and study programs

Source: author's own elaboration

Table 15: strength of direct effects and the explainability related to the map of road models of the examined countries and study programs (d1, d2, d3 = direct effect; e1, e2 = explanatory power; highlighted with grey = not significant direct effect)

	d1	d2	d3	e1	e2
HUN	0.781	-0.103	0.031	0.665	0.210
AUT	0.891	-0.120	0.092	0.768	0.054
SVK	0.787	0.074	-0.189	0.686	0.140
ECON	0.855	0.008	-0.050	0.731	0.084
LAW	0.834	0.009	0.015	0.696	0.002
ART	0.750	-0.208	0.168	0.563	0.337

Source: author's own elaboration

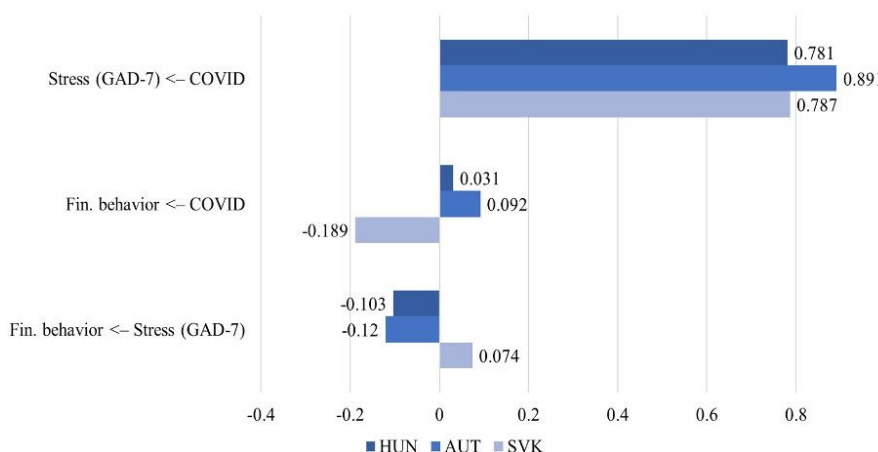


Figure 7: Standardized size of direct effects in the road models of the three countries according to countries

Source: author's own elaboration

Most of the significant effects can be found in Hungary's road model, but this is mainly due to the fact that the Hungarian sample was much larger than that from the other two countries. Of all the impacts, the strongest was the time of the survey, which actually symbolizes the impact of the pandemic. This has a strong positive effect on stress (0.781). That is, "due to" the viral situation, and to exacerbate this, students' stress levels increased greatly. This further rings and also has a negative effect on financial behavior (-0.084). It is important to see that the increase in stress levels is primarily due to the viral situation. The decrease in the level of financial activity was not caused directly by the viral situation, but by the increase in the level of stress (-0.103).

Table 16: Total and 'direct + indirect' effects in the road model of the sample of the examined countries

Country	HUN		AUT		SVK	
	COVID	Stress	COVID	Stress	COVID	Stress
Stress	0.815	0	0.877	0	0.827	0

	(0.781+0.034)	(0+0)	(0.891+-0.014)	(0+0)	(0.787+0.04)	(0+0)
Fin. behavior	-0.053	-0.103	-0.014	-0.120	-0.128	0.074
	(0.031+-0.084)	(-0.103+0)	(0.092+-0.105)	(-0.120+0)	(-0.189+0.061)	(0.074+0)

Source: author's own elaboration

In the model fitted to university students in Austria, the pandemic also had a significant and strong positive effect on stress levels (0.891). This means that there was an increase in their stress levels during the viral situation. The strong effect also resulted in high explanatory power: the level of stress was 76.8%. Based on the model fitted to the Slovak sub-sample, we can see that the pandemic had a significant positive effect on the stress level of university students (0.787). Stress levels rose while financial behavior narrowed somewhat. Thus, a negative effect of COVID on the increase of stress levels can be observed. Similar to the previous two models, in the case of Slovakia the strong effects resulted in a high explanation: stress: it was explained in 68.6%. In contrast to the other two countries, the financial situation of Slovakia also significantly reduced the financial behavior of students (-0.189).

Structural Equation Model – University Study programs

In order to facilitate comparability and to maintain a proven, interpretable structure, we tried to use the same model for comparing individual university courses as for countries. (Figure 6). The fit indices are somewhat weaker than in the country model, but acceptable (NFI = 0.944; RFI = 0.883; IFI = 0.948; TLI = 0.890; CFI = 0.948), the standard error of the fit is also adequate, below 0.08 (RMSEA = 0.065; LO90 = 0.060; HI90 = 0.071). Determined at 5%) and did not impair the magnitude of the fit indices. The statistics of the currently studied effects broken down by sections are presented in Table 17.

Table 17: Size, standardized size, and test statistics of direct effects in the road models of students studying economics (E), law (L), and humanities/pedagogy/arts (HPA)

Study program	Effect	Coefficient	St. Coeff.	St. Error	t	Sig.
E	Stress ← COVID	1.073	0.855	0.014	76.398	<0.001
	Fin. behavior ← Stress	0.001	0.008	0.005	0.196	0.845
L	Stress ← COVID	0.940	0.834	0.029	32.789	<0.001
	Fin. behavior ← Stress	0.001	0.009	0.010	0.106	0.915
HPA	Stress ← COVID	0.871	0.750	0.030	28.609	<0.001
	Fin. behavior ← Stress	-0.039	-0.208	0.009	-4.251	<0.001

Source: author's own elaboration

The pandemic significantly increased the magnitude of stress in all three courses (Figure 8). The pandemic had a significant positive effect on financial behavior only in the case of students of humanities / pedagogy / arts majors, which means that the financial activity of these students increased as a result of the epidemic. Stress alone at students of humanities / pedagogy / arts programs has a negative effect on financial behavior, but not in the other two majors. This means that for humanities-educator-artist students, stress can be a barrier to financial activity.

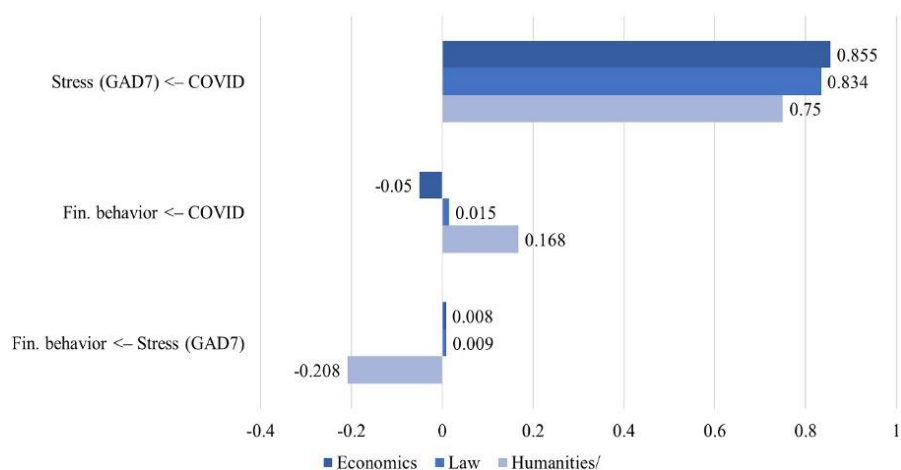


Figure 8: Standardized size of direct effects in the road models of the three study programs
Source: author's own elaboration

Most of the significant effects were produced by the path model of a sub-sample of economics students. This is due to a sample size of more than 2,000 people. The pandemic resulted in a significant increase in student stress levels (0.855). Due to the relatively strong effect, the explanation for stress is high (73.1%). However, financial behavior was not significantly affected by the virus.

Table 18: Total and 'direct + indirect' effects in the road model of the sample of students studying in an economic program

Study program Cause & effect	E		L		HPA	
	COVID	Stress	COVID	Stress	COVID	Stress
Stress	0.855	0	0.834	0	0.75	0
	(0.855+0)	(0+0)	(0.834+0)	(0+0)	(0.75+0)	(0+0)
Fin. behavior	-0.044	0.008	0.022	0.009	0.013	-0.208
	(-0.050+0.007)	(0.008+0)	(0.015+0.007)	(0.009+0)	(0.168+-0.156)	(-0.208+0)

Source: author's own elaboration

Law students had a significantly increased level of stress as a result of the viral situation (0.834). Due to the relatively strong effects, stress has a relatively high (69.6%) explanation in the model (

Table 15 and Figure 6). The lack of significant relationships can be attributed on the one hand to the much lower number of elements and on the other hand to the much weaker impact size. (Table 18).

Similar to the models of the previous two majors, the viral situation strongly affected the stress level of humanities-educator-art majors (0.750); due to the strong effects, the level of explanation for stress is relatively high (56.3%). Although not with the same strength as before, the epidemic had a positive effect on the financial behavior of students in these majors (0.168), i.e., they became more active during the pandemic than before. However, the increase in the stress level - in a unique way for the students of these majors - had a demonstrable negative effect (-0.208) on the financial behavior. The effect of the viral situation as well as stress on financial behavior can only be demonstrated in the case of students of humanities/pedagogy/arts majors; the former is positive and the latter has a negative effect (Table 18 and Figure 8).

CONCLUSION

In my study, I analyzed the impact of environmental crises on the sense of stress and financial behavior of university students. I modeled the crisis with the coronavirus epidemic. In my questionnaire survey, I asked students from three countries about the topic. I conducted two surveys with the same questionnaire before and after the first wave of the pandemic, with a total of roughly 1,600 respondents in both years. Based on the statistical processing of the responses, it can be clearly stated that the pandemic significantly increased the level of student stress and partly through this, partly directly affected the financial behavior. However, the effect differs based on the major majors of university students: economics and law students gave very similar answers, while the stress levels of the humanities-pedagogy-arts majors proved to be somewhat lower. The epidemic increased stress to almost the same extent in all groups. The level of economic knowledge is proportional to the level of stress, i.e., economics students are more aware of the financial difficulties caused by the crisis and therefore experience stress to a greater extent than their peers without economic knowledge. The similar performance of law students and economics students can be explained by the fact that law students are also well informed in financial matters through their knowledge of economic law.

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