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THERE AIN'T SUCH THING AS A FREE LUNCH - OR IS THERE? MORAL HAZARD IN FINANCING HIGHER EDUCATION

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Abstract

Purpose: This study investigates the phenomenon of moral hazard among student population, specifically in the context of financial subsidies and other financing support schemes that they receive while pursuing higher education. The emphasis is on the dynamics of financier-student relationship and the emergence of the moral hazard. The main purpose of this study is to identify and understand the factors that contribute to the occurrence of moral hazard among students, considering financial support they receive from government subsidies and parental contributions.

Design/methodology/approach: For the purpose of this study, the authors conducted a survey among business and administration students at the University of Rijeka in order to investigate presence of moral hazard and its influencing factors. In order to investigate and to analyze the emergence of moral hazard and the impact of its influencing factors the

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Structural Equation Modelling-Partial Least Square (SEM-PLS) method was used.

Findings: With this study authors aim to bridge a gap in research of the presence of moral hazard in the financing of higher education and to investigate the factors that contribute to its emergence. The results of explanatory analyses suggest that financial asymmetry and financial attitudes negatively impact the occurrence of the moral hazard, while financial behaviors were not statistically significant. Additionally, results indicate that moral hazard is influenced by variety of contextual various economics and behavioral factors.

Research limitations/implications: The limited explanatory power of the findings highlights a key limitation, underscoring the inherent complexity and multifaceted nature of the moral hazard construct. Besides this limitation, the authors surveyed only economics and business administration students, excluding students from other files could have impacted the results of analysis and could have led different result of overall student population.

Originality. There are only a few studies on the occurrence of moral hazard in higher education financing in European countries. The welfare state and the subsidization of higher education and supporting schemes for the student expenses are deeply ingrained in the societal consciousness in the majority of European countries that the occurrence of undesirable phenomena such as moral hazard has rarely been questioned. To the best of our knowledge, this study represents the first attempt to explore the occurrence of moral hazard in financing higher education with the PLS-SEM methodology, while also developing constructs that influence occurrence of moral hazard.

Keywords: Moral Hazard, Tuitions Fees, Financing Higher Education, Croatia, Students, PLS-SEM

JEL Classification: H75, I22, J24

1. Introduction

Quality, availability, and affordability of higher education, as well as fostering innovations, are fundamental prerequisites for an innovative, developmental, and adaptable economy capable of responding to challenges that the future brings. The availability and affordability and quality of higher education depends of the higher education systems that governments employ. Countries around the world and their governments adopt different strategies and implement various systems to ensure the maximum quality, effectiveness, as well as accessibility of higher education for their populations. It should be noted that the pursuit of higher education and attainment of improved position and better opportunities, individuals act in collaboration with the state. (Krueger & Lindahl, 2001) have demonstrated that education investment shows substantial payoff, especially for low schooling levels, and that positive externalities from education investments are more likely in disadvantaged

groups. Regarding the quality of higher education, many studies and authors have explored the topic, identifying various metric to quantify it. These include innovations and patents generated, research funds raised, citation impacts of academic publications, and the number of Nobel Prize winners within institutions, i.e., countries (Lerro et al., 2023). Other indicators include graduation rates, employment rates of graduates, institutional credentials and memberships in prominent associations, levels of internationalization, performance in global rankings, contributions to GDP, share of female students, share of female academic staff and many other metrics.

On the other hand, availability and affordability of higher education and consequently, share of the highly educated population in the overall population, significantly depend on the higher education system and its financing scheme. Usher & Medow (2010) in their study identified Finland, Norway and the Nederlands as countries that stands out positively in availability and affordability of higher education to its population. The availability and affordability of studying is tightly connected to study-related costs (tuition fees, living costs, cost of learning materials, etc.) and students' financial opportunities to cover them. The costs of studying can be divided in two major financial components: tuition fees and living costs. The accessibility of the higher education system is heavily influenced by these two categories.

Based on the higher education financing systems and tuitions as main financial burden, countries can be divided in three categories: a) high-tuition systems, b) low-tuition systems, and c) tuition-free systems. In the first group countries, students bear entire or a significant portion of higher education costs including tuition fees. There are financial support schemes that help students in financing studying costs through financial aids, grants and loans– however the overall costs remain high compared to the global averages. The most recognized countries of this group are USA, UK, Canada, Japan and Australia. In the second group consists of countries with low tuition fees. In these countries, the majority of the tuition fees burden cover government with the aim of ensuring equitable access to higher education for all. The financial burden, in these countries, is addressed through direct subsidies or payments to the higher education institutions (HEIs). Some of low tuition countries utilize merit-based grants or financial aid systems to support students. However, other apply a model of universal subsidies to all students, regardless of academic success or socio-economic background. In this group of countries, the overall tuitions costs, after the application of financial support schemes, remain low compared to the global averages. Representative countries include Austria, Italy, France, Croatia, Slovenia, Taiwan, India, and others. Third group consist of tuition-free countries. These can be divided in two subcategories: i) countries with minor costs in form of administrative, however again tuition-free– e. g. Germany, Poland, and ii) countries that are entirely cost-free–e. g. Finland, Norway, and Sweden. It should be noted that countries in latter category typically offer free tuition only to domestic students excluding international students. In some low tuition fees and even tuition-free countries tuition fees can vary significantly–from low to high–for international students.

Countries worldwide implement different strategies and financial schemes to support, in addition to tuition fees and students' living costs– ranging from minimal assistance to covering the majority of the costs. In the majority of the European Union countries governments, ensure access to student dormitories at subsidized prices, as well as subsidies for transportation cost and other forms of direct and indirect financial support. Many countries provide merit-based grants aimed at helping students covering living and educations costs.

In all cases where financial support is provided through subsidies, grants, or other government incentives for the human capital investments–without mechanisms to hold recipients accountable for misuse or opportunistic behavior–there is enhanced risk of moral hazard, including reduced effort and increased risk-taking. In the context of higher education financing, moral hazard may occur when students, higher education institutions, or other actors make suboptimal or opportunistic decisions due to the presence of public subsidies in form of direct tuition waivers, grants, etc. This is particularly pronounced when such supports is not linked to performance, responsibility, or clearly defined obligations and consequences. The phenomenon of moral hazard in environment of higher education can be illuminated by utilizing agency theory. In essence, it examines relationship in which a principal (government, donor, company, or family) allocates resources to an agent (student, or higher education institution) with the expectation to act in principal's interest. However, due to informational asymmetry and/or limited monitoring, agents may act in pursuit of their own objectives instead of in favour of the principal creating conditions for emergence of moral hazard. Furthermore, the occurrence of moral hazard in context of financing the higher education system can be analyzed from two perspective: macro and micro level. The macrolevel level refers to the relationship between the government and higher education institutions. At this level, moral hazard occurs in the classic agent-principal form. Kivistö (2005) notes that HEIs in the competition for attracting financial resources can often act opportunistically and intentionally misrepresent their true ability and willingness to properly perform the tasks they have contracted with the state. At the micro level, moral hazard occurs in the financer-student relationship, which take form of state-student, parent-student, employer-student, etc. Moreover, the role of the financier can have regional government or local-government (counties and municipalities that provide scholarships), banks that provide student loans, and other investors in human capital. The main reasons for occurrence of moral hazard in financier-student relationship, are asymmetric information's and adverse selection. In majority of European Union countries, formal control mechanisms for moral hazard in higher education either do not exist or are week and in need of improvement. This is one of the key motivations for the development of in-depth moral hazard analysis and this research.

Research on the moral hazard and variables that influence its emergence is of a great significance, since only effective investment in higher education and human capital can ensure economic development and state's competitive advantage in a globalized environment.

Each country should raise the question and analytically evaluate the efficiency of investments in higher education to maximize returns and societal impact. Building on these specifics, the authors designed this study to examine the occurrence of moral hazard in the context of financing higher education in Croatia at the undergraduate and graduate levels. The study aims to provide valuable insights into existence of the moral hazard and potential causative agents that influence its emergence. This analysis focuses on students enrolled in the public HEIs, which accounts approximately 93% of the overall student population in Croatia. There are several reasons for examining the occurrence moral hazard in higher education system in Croatia.

First reason is that Croatia belongs to group of low- tuition fee systems in higher education. Furthermore, tuition fees at the private HEIs in Croatia, when compared to the global averages, are also considered to fall within the low-fee systems, and their excluding from the study does not significantly affect the analysis of the tuition-fees system. Moreover, the Croatian higher education system is aligned with the broader European framework. As a result of the Bologna Process initiated 2005, European countries have harmonized their higher education systems by implementing the European Credit Transfer and Accumulation System (ECTS) and adopting common qualification levels. This ensures both horizontal and vertical mobility across countries. Student workload in the European Higher Education Area (EHEA) is measured in ECTS credits, where one ECTS corresponds to 25–30 hours of total student work, including lectures, seminars, individual study, and assessment. Every course in all programs is awarded ECTS points based on the student workload required to achieve the intended learning outcomes. The standard academic load for one year is 60 ECTS credits.

Public HEIs charge students' tuition fees, averaging from 650-1,500€ at the undergraduate and graduate levels, excluding postgraduate study programs. It should be noted that these fees represent only a portion of full market price of tuition-fees, that private HEIs are charging. The difference in the price is covered by the state and encompasses the costs of wages–teaching and other supporting staff like administrative, technical, cleaning and other staff. Tuition fees vary based on the field of study and university or polytechnic (universities of applied sciences) where program is carried out. All Croatian public HEIs operate under merit-based tuition fees system, meaning that all full-time students are exempt from paying tuition fees in the first year of study. Moreover, full-time students who achieve minimum 55 ECTS points in previous year continue to be exempt. Students that achieve between 30-54 ECTS points and transfer then to a next year pay tuition fees based on the number of transferred ECTS point. The price of one ECTS point is calculated by dividing the full participation tuition fee by 60. Students that achieve below 30 ECTS points have to pay full participation tuition fee in range of 650-1,500€.

Second reason, government is heavily subsidizing the living and food costs. According to (Debeljak, 2024) the prices of accommodation in dormitories range from minimum 51.10€ up to112.81€. The price depends on location–city–where dormitory is situated, the number of beds in apartment, as well as the size of apartment and quality of

accommodation (shared bathrooms, equipment in the room etc.). Government subsidizes dormitory residents with 26.54€ for accommodation. However, availably of the place in dormitories is low–the overall share of beds per students is 8.78% if we count full-time and part time, and 11,9% if we compare number of available beds per full-time students. Due to the limited availability, government additionally allocates over 210.000€ each year to subside living cost for full-time students residing in private accommodation. Additionally, various counties and even cities provide subsides and further financial support for students unable to secure dormitory placements. Significant subsidies are also provided to compensate costs of food for students. In the all of the student centers– in Croatian terms, medium and big cities–, but even in some smaller towns, exists student restaurants offer meal services. Through these restaurants government and municipalities support students' living expenses while ensuring access to the meals appropriate nutrition values. The government allocates 19,000,000€ annually to subsidize food expenses for all students, covering 71.24% of the price of a menu meal (European Union, 2023). As a result of this subsidy, students pay only 0.86€ for a full meal, which typically includes soup, a main dish, a side dish/stew, salat, desert or fruit and bread. The number of subsidies meals is linked with the place of residence. All students studying outside the place of residence have right to three subsidized meals and those that are studying in the place of residence have right to two menu meals. Additionally, they all have right to dairy products and other products like non-alcoholic beverages and cakes and other products. This financial scheme significantly reduces the student financial burden of food costs.

Third reason, lays in fact that all full-time students are entitled to free health insurance until they reach the age of 26. This free health insurance covers all possible costs of medical expenses even for the most expensive treatments.

Fourth one, is combination of additional subsidies and indirect financial supports like subsidies for transportation costs of trains, local and intercity bus lines etc. Furthermore, both full-time and part-time students can work through a student contract, which offer significantly lower income tax rates compared to standard employment contracts. Students working under student contracts can earn up to 10,080€ annually without paying any income tax. However, if the student is a dependent family member, the fax-free income threshold is 3,360€ annually. In the Croatian tax system, taxpayers who financially support dependents–such as children (included full-time students), spouses, or other family members who meets specific criteria–are entitled to an annual tax-deductible amount. Beyond the aforementioned, government additionally also provides all students free licence for Office 365, Limesurvey and discounts for other software's like AutoCAD. As well, through SRCE–central infrastructure institution– provides support to all public academic institutions and students, free online digital education on informatic literacy, usage of software's applications and various IT tools. Beside all these subsidies and financial supports students have opportunity to various grants that provided by central and local governments and municipalities.

The last, and perhaps the most important reason, is because Croatia ranks 43rd out of 50

in the Overall U21 2020 Ranking (Williams & Leahy, 2020), underscoring the urgent need for critical assessment and improvement of the system's structure, quality, and funding effectiveness.

These results should be connected to the overall expenditures of the country. Despite providing comparatively extensive financial supports to students in tertiary education–The European Qualification Framework (EQF) level 5-8–, Croatia ranks third from the bottom among EU-27 countries in terms of overall public expenditures for higher education. Among countries with lowest percentage of total public expenditures are Czechia, Estonia and Greece. In contrast to them are positioned countries with highest percentage of total public expenditures Ireland, Denmark, Italy, Sweden and Norway (see table 1). Based on all financial direct and indirect aids, subsidies, supports and tax exemptions that students in Croatia have, this study aims to answer whether the moral hazard is occurring and to find what influence on its occurrence.

Table 1. Financial aid attributed to student on tertiary education level (levels 5-8) - as % of total public expenditure, 2017-2021, EU-27 countries plus Norway

Country	Year					Average
	2017	2018	2019	2020	2021	
EU - 27	15.6	14.9	17.6	18.8	12.3	15.84
Belgium	14.7	14.6	16.4	14.8	15.8	15.26
Bulgaria	10.8	11.2	10.8	11.4	12.1	11.26
Czechia	2.1	1.5	1.4	1.6	1.5	1.62
Denmark	33.5	33.4	32.9	35.3	32.7	33.56
Germany	17.9	17.5	18.8	20.0	18.1	18.46
Estonia	5.3	4.4	4.3	3.7	3.0	4.14
Ireland	36.8	34.7	33.6	32.8	42.1	36.00
Greece	1.3	0.9	1.0	:	:	1.07
Spain	11.2	11.5	11.1	11.1	12.1	11.40
France	8.7	8.5	8.3	9.1	9.0	8.72
Croatia	**2.0**	**1.2**	**1.3**	**4.0**	**3.9**	**2.48**
Italy	26.1	27.9	29.0	28.9	31.2	28.62
Cyprus	17.3	20.6	20.1	19.1	17.2	18.86
Latvia	8.1	5.4	5.1	4.8	5.8	5.84
Lithuania	11.1	9.5	9.2	7.1	7.9	8.96
Luxembourg	5.6	6.0	5.8	5.7	5.3	5.68
Hungary	14.7	10.7	16.4	17.5	8.3	13.52

Malta	12.7	12.7	10.8	12.6	13.2	12.40
Netherlands	28.7	33.3	29.1	27.9	26.3	29.06
Austria	8.1	8.6	10.9	11.6	10.0	9.84
Poland	11.3	10.9	8.8	8.6	8.0	9.52
Portugal	12.7	12.8	12.4	12.0	12.7	12.52
Romania	10.4	10.3	8.8	9.0	8.8	9.46
Slovenia	9.5	13.3	13.2	12.7	12.1	12.16
Slovakia	12.3	11.7	10.9	10.2	9.7	10.96
Finland	12.9	9.0	9.0	8.6	8.6	9.62
Sweden	26.7	26.7	27.3	28.7	29.1	27.70
Norway	28.2	28.0	28.3	30.9	32.1	29.50

Source: https://doi.org/10.2908/EDUC_UOE_FINA01

Furthermore, the overall share of the Croatian population with third level educational (EQF 5-8) is among lowest in the EU-27, at only 26.5%, alongside countries such as Czechia, Italy, Hungary, and Malta. In contrast, countries with highest level of tertiary education attainment–exceeding 40 % of overall population– include Ireland, Spain, Cyprus, Sweden and Norway.

Table 2. Population by educational third level educational attainment (%), 2017-2024, EU-27 countries plus Norway

Country	Year							
	2017	2018	2019	2020	2021	2022	2023	2024
EU - 27	26.7	27.5	28.3	29.3	30.1	30.6	31.4	32.2
Belgium	36.0	36.1	36.3	37.8	39.8	40.5	39.4	38.9
Bulgaria	24.5	24.8	24.6	25.8	26.1	26.2	26.6	29.3
Czechia	21.1	21.4	21.3	21.7	23.0	23.1	23.0	23.4
Denmark	31.8	32.2	33.0	33.4	34.6	34.7	35.1	36.2
Germany	25.3	25.8	26.7	27.9	28.9	28.8	29.8	30.9
Estonia	35.0	35.7	36.0	35.7	36.7	37.3	36.2	36.1
Ireland	38.5	38.4	38.6	40.6	43.1	43.3	43.4	44.9
Greece	28.1	28.7	28.9	29.5	30.8	31.2	30.7	31.4
Spain	34.6	35.5	36.5	37.5	38.0	38.7	39.5	40.1
France	31.9	33.3	34.4	35.8	36.9	37.4	38.1	39.0

Croatia	20.6	21.9	22.0	22.3	22.4	22.8	24.8	26.5
Italy	17.2	17.8	18.2	18.6	18.7	19.0	20.1	20.7
Cyprus	40.3	40.6	42.0	43.6	45.7	46.1	48.3	49.4
Latvia	31.6	31.9	32.9	34.7	35.7	35.6	35.0	35.4
Lithuania	34.7	35.9	37.8	38.6	39.6	41.1	40.7	41.3
Luxembourg	26.7	29.3	31.2	32.3	35.6	36.3	36.8	38.7
Hungary	20.8	21.7	22.4	23.4	25.4	25.4	25.6	26.7
Malta	19.4	20.8	21.8	23.4	25.1	25.7	26.4	28.4
Netherlands	32.2	33.3	34.5	36.3	37.3	38.5	38.2	38.6
Austria	29.9	30.2	31.2	31.4	31.9	32.5	33.6	34.5
Poland	26.2	27.1	28.5	29.1	29.3	29.9	33.0	34.1
Portugal	21.8	22.6	23.8	24.6	26.1	26.7	26.9	28.4
Romania	15.3	15.5	16.0	16.2	16.3	17.0	16.1	16.5
Slovenia	29.3	29.5	30.2	32.5	36.5	36.6	31.6	32.3
Slovakia	20.7	22.0	23.1	23.9	24.7	25.9	25.7	25.6
Finland	37.1	38.1	39.1	40.4	36.2	36.7	36.8	36.6
Sweden	35.3	36.7	37.6	38.3	39.5	40.8	41.4	42.2
Norway	36.7	37.7	38.2	38.8	39.8	40.6	41.7	42.4

Source: https://doi.org/10.2908/EDAT_LFS_9911

The rest of the paper is structured as it follows. Section 2 presents a literature review on the moral hazard in financing higher education, followed by Section 3 methodology, after which in Section 4 results are presented, followed by last Section that concludes.

2. Literature review

Research on moral hazard has emerged from the insurance industry and it primarily related to asymmetric information, as well as the relationship between agent-principal and adverse selection. The literature on moral hazard in context of higher education financing can be divided into several research directions. Main areas include: i) student loans, ii) taxation and the sources and scope of funding, and iii) parental financial support and asymmetric information.

The emergence of the moral hazard to student loans is most extensively researched topics. A key challenge faced by loan providers encounters is finding effective strategy to address and tackle the moral hazard occurrence. In the study of Gary-Bobo & Trannoy (2015) imply that when creating the loans four main ingredients should be integrated in it: risk aversion–without it there is no demand for insurance and redistribution, ex ante moral

hazard–absence of it bring students no consequences of academic failure, a screening problem–suggest an education planning problem and help talented individuals to study longer, and ex post moral hazard–should be addressed. Chatterjee & Ionescu (2012) explored possibility of the offer of full insurance against risk of college failure. Their finding was positive connected to full loan forgiveness and introduction of those insurances would not raise failure rates. Opposite result was obtained by Walker & Florea (2014), they found that the scope of financial assistance is positively related to the likelihood of moral hazards behaviors among students. However, having in mind the level of debt and source of students' loans affects the student financial satisfaction and Robb et al. (2019) study analyzed that issue. In their study they have explored student loan debt impact on financial satisfaction, with mixed results. No direct associations were found between student loan debt and financial satisfaction. (Goodell, 2016) underlines those for-profit institutions systematically encourage ill-advised student loans what leads to the higher default rates. They pinpoint that this situation is similar to the bank misbehavior and pour screening of the borrowers. That kind of loans can be considered a form of moral hazard in financing the students.

Cigno & Luporini (2009) in their work examines which source of founding students is advanced. They have underlined several conclusions, first one is that scholarship schemes financed by graduate taxes outperform loan schemes, especially when policy constraints limit tuition fees or impose no-usury rule. Second, they highlight that even if individual study effort is observable, it may not be socially desirable for all students to specialize in subjects with the highest graduate earnings, and third emphasize the impact of parental support on student study effort and the role of parents in inducing students to study harder. Bodvarsson and Walker (2004) in their study examined parental cash transfers and occurrence on moral hazard in students' academic performance. Results of their study indicate that parental cash transfers negatively impact college students' academic performance i.e., students who receive financial support from parents may perform a higher risk of failure knowing that their parents will bear the costs of failure and may not be able to verify the reasons for failure, thus dulling the incentive to succeed academically.

On the other hand, study carried out by Montalbán (2023) explores how stricter academic requirements in need-based financial aid–grants– improve student performance without raising dropout rates in Spain. Result of his study indicates that financial support has no significant impact on student performance under weak academic requirements but strongly enhances performance when tied to rigorous academic standards. Also, highlighting that combining financial support with strong academic requirements does not increase dropout rates, indicating that performance incentives can mitigate moral hazard without deterring student persistence. Rattini (2023) have investigated impact of financial aid among Italian students and impact on their graduation time. Main conclusion of her study indicated that students receiving more generous financial assistance earn fewer credits during their studies and take significantly longer to graduate, with no impact on GPA or dropout rates. Moreover, higher-aid recipients are delayed in their graduation by over a year on average, largely due to meeting only the minimum credit requirements. Opposite to these

findings study by Delogu et al., (2024) noticed that tuition fees and financial income are crucial to increasing dropout rate, also they conclude that only by providing substantial financial support can significantly reduce the likelihood of students drop-out rates.

To the best of the authors knowledge, no previous study has provided a comprehensive analysis encompassing the broader economic and psychological dimensions that contribute to the emergence of moral hazard. By examining the relationship of economic and psychological, dimensions, this study seeks to fill this existing gap in the literature concerning the drivers of moral hazard in publicly funded higher education systems.

3. Methodology

For purpose of this study, primary data were obtained through the administration of a standardized survey questionnaire among economics students of University of Rijeka, Croatia. In the introduction to the questionnaire, the purpose and aims of the study ware outlined, and moral hazard was defined as "risk to which one party is exposed when it depends on the moral behavior of the other party ". The survey questionnaire consisted of 42 questions, categorized into eight sections/groups. The first section addressed socio-demographic questions, followed by section and questions and statements of other constructs. To ensure the reliability of the measurement instrument and all constructs, the authors conducted a pilot test and evaluated statements comprising each construct. Some of the constructs were adapted from previous studies, which are elaborated further in the text. Initial version of moral hazard construct included seven statements, of which only four have satisfied statistical requirements and have been used further in the survey. Those four statements are "I don't care if I extend the time of study"; "I plan to extend my studies"; "I don't worry if I don't pass all the courses awarded with ECTS points in academic year"; "I'm not upset if I don't pass course". Subsequently, the authors included questions and statements on Financial Situation that was measured with six statements "I can't cover tuition without financial "hassle" and worry"; "I think the tuition price is too high"; "I can't independently cover all the costs of studying"; "I think my total study costs are too high in relation to my future income"; "I have to work extra to cover all study costs"; "My study costs significantly negatively affect my and my family's budget and our consumption". Five statements related to Financial Attitudes and seven statements for Financial Behavior were adpoted from College Student Financial Literacy Survey developed by David Moore. Statements for Risky and Problematic Financial Behavior construct authors adopted from Worthy et al. (2010). The Construct Perceived Financial Assistance had five statement "I believe the government provides me with adequate financial aid during my studies"; "I believe my university/college provides me with adequate financial aid"; "I believe that subsidies for student meals are fair and adequate"; "I think the tuition fee is subsidized"; "I believe that the financial aid that society provides to students is sufficient". Last construct Financial Asymmetry consisted of four statements, "I provide my parents/guardians all information about my academic

success throughout the entire academic year"; "My parents/guardians are interested in my academic success"; "Every year I am obliged to report my academic success (passed ECTS credits) and based on success, I will pay my tuition and study costs for the next year"; and "I believe that hiding academic information from financiers (parents/state/county/employer) is not such a big problem". For purpose of this study assessment for all investigated groups i.e., constructs utilized 5-point Likert scale (1 = completely disagree, 5 = completely agree) questions.

In the socio-demographic questions employed in the survey were formulates as dichotomous, multiple choice, binomials questions. It should be noted, that some question groups–financial situation, financial assistance, financial attitudes, risky and problematic financial behavior, asymmetric information– also included other category of questions (dichotomous, multiple choice and binomials). Nevertheless, for purpose of this study, those questions weren't implemented neither analyzed. Participants were also given option to indicate that particular statement does not refer to them/or it is not applicable.

In the following section, the authors provided in detail description of the sample, the measurement model and the statistical analysis technique.

3.1. Sample

The target population in this study were undergraduate and graduate students in business and administration at the University of Rijeka, Croatia. The survey was conducted online using the LimeSurvey platfom. For purpose of this study, a non-probability sampling method–specifically, convenience sampling– was applied. Participants were selected based on their convenient accessibility and willingness to participate in the survey. As (Bhardwaj, 2019) describes this sampling method as only those members are selected who are easily accessible to the researcher.

The authors distributed a total of 493 questionnaires to undergraduate and graduate students the from two faculties Faculty of Tourism and Hospitality Management and Faculty of Economics and Business. With one exception, the first-year students of undergraduate level weren't included due to the fact that they still didn't have opportunity do manifest moral hazard behaviour. At the time of survey administration, the total enrolled students on both faculties were approximately somewhat lower than 6,000. Excluding first year students, the overall population was 4,825 students. The survey response rate was 8,08%, meaning 390 fully completed and usable questionnaires were collected for the purpose of statistical analysis. Having in mind the 10-Times Rule Method, saying the maximum number of inner model links pointing at any latent variable in the model, according to Barclay et al. (1995) a total of 80 useable samples would be sufficient for PLS-SEM in the case of this study. However, the (Hair et al., 2021) suggested that this rule of thumb offers a rough guideline, the minimum sample size requirement should consider the statistical power of the estimates, or even inverse square root method. Therefore, authors did employ power analysis using program G*Power 3.1.9.7 and the setting for the calculations are in the line

with (Cohen, 1992; Faul et al., 2007), effect size (f2) was set on 0,15 (medium), α set on 0,01 and the power level of 90% of number of six predictors. Based on the settings with the G*Power required sample size was 164. Calculation of the sample size was done additionally by inverse squared root method based on (Hair et al., 2022; Kock & Hadaya, 2018) recommendation and with the minimal path valued of 0,137 (range 0.11-0.2) at the α level 0,01 the recommendable robust minimum sample size would be 251. A third calculation was conducted using the online calculator developed by Soper (2024), settings anticipated level size at 0.1, statistical power level at 90% number of latent variables 6, and observed variables at 46 with the α level 0.01. According to this model recommendable minimum sample size was 303. To ensure the robustness of the sample model the authors obtained 390 fully completed surveys. Among the students participants, 107 (27%) were male and 283 (73%) female. Although the overall student population appears to be predominantly female, this distribution reflects the actual gender ratio at both faculties, where approximately 70% of students are female and 30% male. Based on this proportion, the sample meets the criterion for gender representativeness.

3.2. The measurement model and statistical analysis

For the purpose of the study, hypotheses were tested based on structural equation modelling using a Partial Least Squares (PLS) method. In order to conduct the analysis, Smart PLS4 software was used (Ringle et al., 2022). In the first step, the measurement model was assessed. The examination of the outer model was performed through the assessment of three key criteria: outer loadings of each construct, as well as their composite reliability (CR) and average variance extracted (AVE) which are presented in Table 1 constructs' validity and reliability.

Table 1. Constructs' validity and reliability.

Construct	Outer loadings	CR	AVE
Moral Hazard	0.879	0.885	0.662
	0.892		
	0.842		
	0.610		

Finical Situation	0.676	0.841	0.470
	0.561		
	0.634		
	0.710		
	0.787		
	0.725		
Perceived Financial Assistance	0.698	0.851	0.535
	0.676		
	0.699		
	0.797		
	0.780		
Financial Attitudes	0.813	0.851	0.537
	0.648		
	0.799		
	0.777		
	0.599		
Risky/Problematic Behaviour	0.648	0.874	0.498
	0.775		
	0.771		
	0.722		
	0.718		
	0.670		
	0.622		
Financial Behaviour	0.504	0.801	0.457
	0.522		
	0.799		
	0.841		
	0.641		
Financial Asymmetry	0.686	0.763	0.448
	0.765		
	0.617		
	0.598		

Source: Authors' own calculations

Since outer loading above of 0.5 is regarded as acceptable according to (Chin, 1998), it can be seen from the table presented above that this criterion is met. Furthermore, composite reliability for all constructs was high (above 0.70), so the internal consistency is ensured. Regarding the AVE values, the actual value was lower for few constructs than the target value > 0.5. However, AVE values can be less in the case CR is more than the acceptable level of 0.6 (Lam, 2012). As it can be seen, CR values are all above 0.70 which is acceptable in the light of the assessment and AVE values as well. After this followed discriminant validity evaluation through both Forner-Larcker criterion and Heterotrait-Monotrait Ratio of Correlations (HTMT). The results are presented in Table 2. and Table 3.

Table 2. Discriminant validity

Constructs	Financial Asymmetry	Financial Attitudes	Financial Behaviour	Financial Situation	Moral Hazard	Perceived Financial Assistance	Risky/ Problem Behaviour
Financial Asymmetry							
Financial Attitudes	0.232						
Financial Behaviour	0.318	0.631					
Financial Situation	0.141	0.220	0.395				
Moral Hazard	0.320	0.222	0.162	0.125			
Perceived Financial Assistance	0.133	0.149	0.280	0.237	0.084		
Risky/ Problem Behaviour	0.372	0.416	0.480	0.521	0.174	0.135	

Source: Authors' own calculations

Table 2 demonstrates that all constructs have diagonal values exceeding their corresponding correlation coefficients, in line with the criteria established (Fornell & Larcker, 1981). Furthermore, the Heterotrait-Monotrait ratio of correlations (HTMT) was examined, with all values falling below the recommended threshold of 0.90, as shown in Table 3.

Table 3. Heterotrait-monotrait (HTMT)

	Financial Asymmetry	Financial Attitudes	Financial Behaviour	Financial Situation	Moral Hazard	Perceived Financial Assistance	Risky/ Problem Behaviour
Financial Asymmetry							
Financial Attitudes	0.232						
Financial Behaviour	0.318	0.631					
Financial Situation	0.141	0.220	0.395				
Moral Hazard	0.320	0.222	0.162	0.125			
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Risky/ Problem Behaviour	0.372	0.416	0.480	0.521	0.174	0.135	

Source: Authors' own calculations

4. Results

In order to examine the relationship among the constructs in the presented model, 5000 bootstrapping iterations were performed. The measurement of the structural model is presented in the Table 4.

Table 4. Structural estimates (hypotheses testing)

Correlation of Variables	Path coefficient	p-value	Decision
Financial Asymmetry →Moral Hazard	-0.214	0.000	Supported
Financial Attitudes → Moral Hazard	-0.137	0.019	Supported
Financial Behaviour → Moral Hazard	0.007	0.460	Not supported
Financial Situation →Financial Behaviour	-0.189	0.000	Supported
Perceived Financial Assistance → Financial Behaviour	0.193	0.000	Supported
Risky/Problematic Behaviour → Financial Behaviour	-0.306	0.000	Supported

Risky/Problematic Behaviour → Financial Asymmetry	-0.267	0.000	Supported
Risky/Problematic Behaviour → Financial Attitudes	-0.353	0.000	Supported

Source: Authors' own calculations

Based on hypotheses testing, all variables, except Financial Behavior, exhibit a significant influence. Variables Financial Asymmetry and Financial Attitudes have a negative impact on Moral Hazard. Financial Behavior is negatively influenced by Financial Situation, positively influenced by Perceived Financial Assistance, and negatively affected by Risky and Problematic Behavior.

However, no significant relationship was identified between Financial Behavior and Moral Hazard. Additionally, Risky and Problematic Behavior has a statistically significant negative effect on Financial Asymmetry and Financial Attitudes. The structural estimations and testing results are presented in Figure 1.

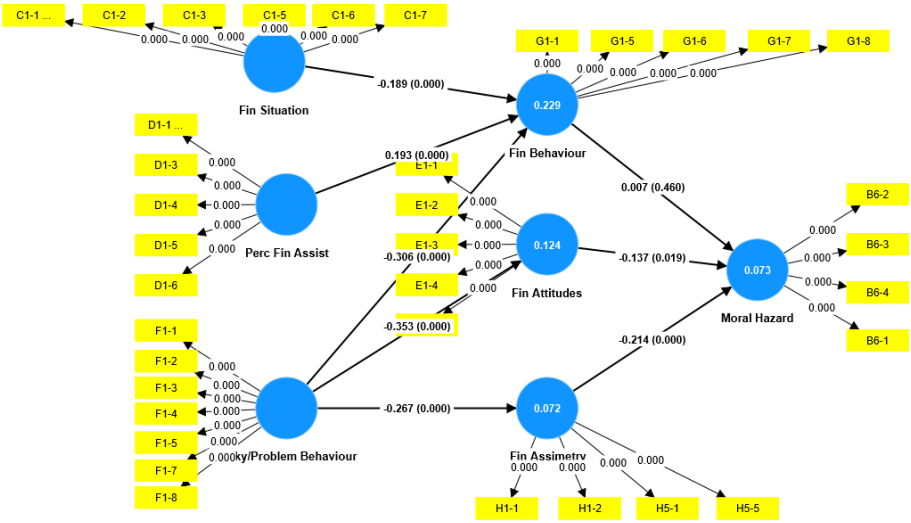

Figure 1. Estimation of the inner model

Furthermore, the coefficient of R-squared for Moral Hazard in this research is 0.073, suggesting that the influence of presented independent variables is 7,3%. According to the (Cohen, 1988) guidelines, this is considered as a weak explanatory power.

Given that this study is primarily exploratory in the nature, and considering it is one of the few studies that attempt to define moral hazard in financing higher education in low-tuition systems or no-tuition systems and to identify the factors influencing it, it was not feasible to include all relevant predictors to fully explain the outcome variable – moral hazard. The limited explanatory power certainly reflects the complexity of the moral hazard construct, which is influenced by a multitude of contextual, economic, and behavioral

factors that are difficult to capture comprehensively. Additionally, effect sizes (f2) were estimated within this model, and results are presented in the Table 5.

Table 5. Relative effect size

Predictor relationship	f^2 Effect size
Financial Asymmetry →Moral Hazard	0,048
Financial Attitudes → Moral Hazard	0,016
Financial Behaviour → Moral Hazard	0,000
Financial Situation →Financial Behaviour	0,037
Perceived Financial Assistance → Financial Behaviour	0,048
Risky/Problematic Behaviour → Financial Behaviour	0,077
Risky/Problematic Behaviour → Financial Asymmetry	0,142

Source: Authors' own calculations

(Cohen, 1988) guidelines suggest that 0.02 is for small effects, 0.15 for medium effects, and 0.35 for large effects. By analyzing the results, it can be said that all effects are rather small. Also, the predictive relevance of the proposed model (Q2) was tested, through the PLS Predict procedure. The Q2 values for the inner model (Financial Asymmetry Q2= 0.058, Financial Attitudes Q2= 0.111, Financial Behavior Q2= 0.200, Moral Hazard Q2=0.014) were >0.000, confirming a predictive relevance.

Despite these limitations, the study provides a valuable and useful information and lays foundation for future research by identifying key variables influencing moral hazard and therefore stress areas for further exploration in this under-researched field.

5.Conclusion

To conclude, this study presents key insights of phenomenon of moral hazard in the context of financing higher education in Croat–low-tuition system country– focusing on undergraduate and graduate students in business and administration. It also explores economic and behavioural factors that influence its occurrence. The findings confirm the presence of moral hazard under set-up conditions. The relatively weak explanatory power can be explained by a complex interplay of economic, behavioural, and contextual factors. Financial asymmetry and financial attitudes were found to negatively impact moral hazard, while financial behaviour showed no statistically significant effect. The study results that government subsidies, parental support, and merit-based tuition fee systems in present form and with weak monitoring may unintentionally encourage moral hazard behaviours, such as reduced effort and delayed academic progress.

The results confirm the existence of moral hazard and need for policy makers to

critically evaluate the efficiency of the financial aid in mechanisms higher education system. Transparent and targeted reforms could help mitigate the risk of the moral hazard by initiating new financial schemes imposing mechanisms to encourage responsible behavior as well as efficiently usage of financial resources. On potential approach to reducing moral hazard could involve the introduction of income-based grants, rigorous academic performance and lining it with the portion the financial support. Alongside, more frequently reporting and audits of principals i. e. financiers on students' merits and performance could contributing mitigating occurrence of moral hazard. Such measures could promote more responsible financial behavior and improve academic outcomes and while reducing misuse of financial support schemes.

This study focused only in one group of students based on their field of study limiting study to generalizability, and that could be potential limitation. Additional limitation of this study is that the construct of moral hazard has weal explanatory power of the moral only 7.3%. This result displays necessity for further analysis of the moral hazard issue with introducing new economic and behavioral variables. Moreover, the overall population sample is 8% may also present potential limitation. For this reasone PLS-SEM methodology was employed, as it is suitable for exploratory studies and robust even with smaller sample sizes.

Future research should concentrate on expansion of the presented model, broaden the range field of study, study programmes, and to include more higher education institutions and countries covered by the study. Model should be expanded with social, cultural and institutional factors. Besides all above, the longitudinal studies with deep interviews could provide new information on occurrence of the moral hazard and connected variables. By expanding research, future analysis could contribute designing more effective, quality, availability and affordability.

For policy makers and academia, these findings emphasize the urgent need to design transparent, more advanced merit-linked based financial support mechanisms that promote accountability, ensure efficient resource allocation, and ensure valuable long-term academic students' outcomes.

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