

**MASTER**  
ECONOMICS

# **Assessing the Impact of Tuition Fees on Student Finances, Enrollment, and Attainment**

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ASSESSING THE IMPACT OF TUITION FEES ON STUDENT  
FINANCES, ENROLLMENT, AND ATTAINMENT

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*“And I Knew Exactly What to Do. But In a Much More Real Sense, I Had No Idea What to Do.”*

(Michael Scott, The Office)

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**Abstract:**

The impact of higher education tuition fees on its students' finances, enrollment decisions, and academic performance is a critical issue in the debate on equity in educational policies. In Portugal, the costs associated with higher education continue to pose barriers for many students. This research seeks to answer the question: "What is the impact of higher education tuition fees on students' finances, enrollment, and academic attainment?". Thus, this dissertation examines the impact of higher education tuition fees on student finances, enrollment timing, and academic attainment across 18 European countries, utilizing microdata from the EUROSTUDENT VIII survey (2021–2024). Employing logistic regression models, the analysis explores whether tuition fees exacerbate financial stress, delay access to tertiary education, or influence academic outcomes. The findings reveal that tuition fees have no substantive effect on any of the three outcomes once individual, financial, and institutional controls are accounted for. In contrast, factors such as public financial support, parental education, and gender significantly influence student experiences and success. Public aid, in particular, reduces financial strain and enhances attainment, highlighting its critical role in promoting equity in higher education. The study underscores the importance of comprehensive support mechanisms over tuition policy alone in addressing socioeconomic disparities in access and achievement.

**JEL codes:** I22, I23, I24**Keywords:** Higher Education, Tuition Fees, Enrollment, Financial Stress, Attainment

## **Resumo:**

O impacto das propinas do ensino superior nas finanças dos estudantes, nas suas decisões de matrícula e no seu desempenho académico constitui uma questão central no debate sobre a equidade das políticas educativas. Em Portugal, os custos associados ao ensino superior continuam a representar barreiras significativas para muitos estudantes. Esta dissertação procura responder à questão: “Qual é o impacto das propinas do ensino superior nas finanças dos estudantes, nas suas decisões de matrícula e no seu desempenho académico?”. Assim, este estudo analisa o impacto das propinas no ensino superior sobre as finanças, o momento de ingresso e o aproveitamento académico dos estudantes, com base em microdados do inquérito EUROSTUDENT VIII (2021–2024), que inclui informação proveniente de 18 países europeus. Recorre-se à aplicação de modelos de regressão logística para averiguar se as propinas agravam o stress financeiro, atrasam o acesso ao ensino superior ou influenciam os resultados académicos. Os resultados evidenciam que, após a introdução nos modelos de variáveis individuais, financeiras e institucionais, as propinas não têm um efeito substantivo em nenhuma das três dimensões analisadas. Em contrapartida, fatores como apoio financeiro público, educação parental e género revelam impactos significativos nas experiências e no sucesso académico dos estudantes. O apoio público, em particular, reduz o stress financeiro e melhora o desempenho académico, além de desempenhar um papel fundamental na promoção da equidade no ensino superior. O estudo destaca, assim, que a promoção da equidade no ensino superior depende mais da existência de mecanismos de apoio adequados do que de políticas de propinas.

**Códigos JEL:** I22, I23, I24

**Palavras-chave:** Ensino Superior, Propinas, Stress Financeiro, Ingresso, Sucesso Escolar

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## 1. Introduction

The landscape of tuition fees in higher education across Europe has experienced changes over the past few decades (Fricke, 2018). European countries exhibit a wide range of tuition fee policies, from free higher education to relatively high fees, reflecting diverse political, economic, and social priorities. This variation is supported by different views on the role of higher education in society, as well as debates about who should bear the cost of education—the state, individuals, or a combination of both (European Commission, 2014; Marcucci & Johnstone, 2007).

In recent years, several European countries have introduced reforms to make higher education more affordable, with some reducing tuition fees or eliminating them altogether. The trend towards low or no tuition fees is particularly prevalent in Nordic countries like Denmark, Finland, Sweden, and Norway, where higher education has been historically free or very low-cost for both domestic and EU students (European Commission, 2020). On the other hand, countries like the United Kingdom have increased tuition fees substantially since the early 2000s. The financing of higher education institutions across Europe is a complex mix of public funding, student fees, and other revenue streams (European Commission, 2020). Portugal, like many European countries, has a mixed approach to tuition fees. Higher education institutions (HEI) in this country charge tuition fees, which vary by institution (public or private) and program<sup>1</sup>.

The literature on tuition fees in higher education highlights several key themes in understanding how fees impact student enrollment, finances, and academic outcomes. The European Commission (2020) report on higher education emphasizes that students, particularly those that come from lower-income families, are highly sensitive to the availability (or lack) of sufficient funds. This manifests as a barrier through both the direct cost of tuition and the indirect cost of studying, such as living expenses, which in many cases are not sufficiently covered by student aid systems. In fact, a national survey conducted in 2023 by Direção-Geral do Ensino Superior (DGES) highlights that financial difficulties continue to hinder access to higher education for many students in Portugal, particularly those from low-income backgrounds (Martins et al., 2023). This report indicates that while

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<sup>1</sup> In public higher education institutions, tuition fees are fixed for all undergraduate programs. For graduate programs tuition fees vary in value among all types of institutions and study fields.



some students benefit from scholarships and state aid, many still struggle to cover living expenses while attending university. According to Bietenbeck et al. (2023), tuition fees often create a gap between those who can afford education and those who cannot. By eliminating fees, countries can help level and mitigate class-based disparities in educational attainment (Bietenbeck et al., 2023). However, the literature is ambiguous in terms of the impact of tuition fees on students' attainment (Fricke, 2018; Oosterbeek & van den Broek, 2009). Furthermore, some studies indicate that a significant increase in tuition fees has a negative impact on higher education enrollment (Hemelt & Marcotte, 2011; Hübner, 2012). Additional to the impact on enrollment, literature shows that these fees significantly influence students' choices like field of study, and institution type, shaping long-term financial outcomes and perpetuating disparities based on socioeconomic background (Zimmerman, 2019; Mountjoy, 2022; Kirkebøen et al., 2016).

Therefore, the impetus for this study stems from the ongoing debate surrounding affordability in higher education. Especially in the current economic global landscape, with rising living costs and economic crises, this issue has become more critical than ever. Thus, the aim of this study is to analyze the impact of tuition fees in European higher education students by responding to the following research question: “What is the impact of higher education tuition fees in its students’ finances, enrollment and attainment?” by analyzing the case of several European countries. For this matter data will be analyzed from the EUROSTUDENT VIII survey for the three dimensions mentioned above using an econometric model.

The relevance of this research lies in the increasing discussion around the need to promote greater equity among students from different backgrounds in higher education, especially during economic crises when many struggle to cover educational expenses. In fact, in Portugal, over the years the number of students that struggle to finance the cost of higher education has increased (Martins et al., 2023). This type of study is relevant for policy makers to create policies that mitigate the inequity gap between students from different backgrounds.

The present study is organized as follows. Section 1 introduces the research theme and outlines its objectives. Section 2 reviews the existing literature on tuition fees, including their effects on higher education institutions, student enrollment, academic performance, finances and equity issues. Section 3 describes the data used for analysis, followed by descriptive statistics. Section 4 explains the methodology employed. The empirical results are presented in Section 5. Finally, Section 6 offers concluding remarks.

## **2. Literature review**

The financing of higher education in Europe has undergone significant changes, particularly through the implementation of cost-sharing mechanisms such as tuition fees (European Commission, 2014). The move toward cost-sharing, defined as the redistribution of higher education costs between governments and private actors, has been a defining trend. Marcucci and Johnstone (2007) highlight that tuition fees have become a critical revenue source amid decreasing public funding for higher education. They argue that these fees aim to enhance institutional sustainability, incentivize efficiency, and align university offerings with labor market demands. However, tuition policies often raise concerns about equity, as they may deter students from lower socioeconomic backgrounds despite being paired with financial aid programs. The equity dimension of tuition fees is a recurring concern. Boliver (2013) illustrates how the rise in UK tuition fees, first to £3 000 in 2006 and later to £9 000 in 2012, disproportionately affected marginalized groups. Despite policies such as income-contingent loans and bursaries, this authors' findings indicate that students from lower socioeconomic and minority backgrounds remain underrepresented in elite universities, despite similar academic qualifications. The persistence of such inequities underscores the limitations of current financial aid systems and highlights the importance of contextualized admissions practices.

### **2.1. Tuition fees implications for HEI and its students**

The introduction of tuition fees and broader cost-sharing policies has had complex implications for both HEI and students. While institutions often benefit financially from tuition fees, these funds are frequently directed toward systemic expansion rather than directly improving the quality of education for students (European Commission, 2014). For instance, in countries like Canada and England, tuition fee revenues have been invested in administrative functions, infrastructure, and research activities, often at the expense of reducing student-to-teacher ratios or enhancing classroom experiences. The growing emphasis on performance-based funding and the push for private sector contributions introduce new challenges for HEIs (Lepori, 2021). While market-driven funding models encourage efficiency and competition, they may also shift institutional priorities away from fundamental educational goals toward revenue-generating activities (Lepori, 2021).

Balancing financial sustainability with educational equity remains a key policy challenge in higher education finance.

From the student perspective, tuition fee increases significantly shape decision-making. Rising costs have prompted many students to opt for fields of study with clear employment prospects, avoiding disciplines perceived as less lucrative (Kirkebøen et al., 2016). Similarly, geographic and institutional choices are influenced, with students gravitating toward universities closer to home to reduce living expenses.

Moreover, countries like Germany and Austria, which introduced or raised tuition fees during the early 2000s, witnessed minimal changes in overall enrollment rates (European Commission, 2014). However, the composition of the student body shifted subtly, with fee increases potentially discouraging older students and those pursuing part-time studies. These patterns suggest that, while financial aid systems mitigate some barriers, they are not universally effective in addressing the compounded disadvantages faced by underrepresented groups. Notably, fee increases have a disproportionately adverse impact on non-traditional students, such as those entering higher education later in life or from lower-income families (Boliver, 2013). For example, England's 2012 tuition fee reform resulted in a marked decline in applications from older students, even though participation rates among 18-year-olds remained relatively stable (Boliver, 2013). This highlights a critical limitation of cost-sharing models: while they often maintain aggregate enrollment levels, they risk deepening inequities within specific demographic groups.

## **2.2. Impact of tuition fees on higher education enrollment**

Studies evaluating cost-sharing policies changes show mixed effects on enrollment. Some studies indicate that there are no significant negative effects of tuition fees on overall enrollment rates, highlighting that modest fees, combined with robust financial aid systems, do not significantly deter university attendance (Bruckmeier & Wigger, 2014). A key finding of Havranek et al. (2018) is that, despite widespread assumptions that higher tuition fees deter enrollment, the overall elasticity of enrollment with respect to tuition fees is close to zero. This suggests that, on average, changes in tuition fees do not significantly affect the number of students enrolling in higher education institutions. However, this average effect masks considerable heterogeneity. Nonetheless, the study identifies specific subgroups that exhibit stronger negative responses to tuition increases. These include students attending private universities, likely due to the relatively higher baseline costs associated with these

institutions, and those from lower-income backgrounds. In contrast, students at public universities, where tuition is often lower, tend to exhibit less sensitivity to tuition changes.

Conversely, other studies reveal opposite effects. The introduction of tuition fees has been shown to somewhat negatively affect enrollment rates (Helmet & Marcotte, 2011). In Germany, the implementation of fees in seven states resulted in a measurable decline in student enrollment, highlighting the sensitivity of enrollment decisions to cost (Hübner, 2012). This trend reflects a broader pattern in which the presence of tuition fees, regardless of their scale, acts as a barrier to higher education participation. Moreover, the observed impact emphasizes that even comparatively low tuition fees, such as those implemented in Germany, can deter prospective students from enrolling (Bietenbeck et al., 2023). Garibaldi et al. (2012) have established that higher tuition fees typically lead to lower enrollment rates, particularly among students from disadvantaged backgrounds. However, the authors do not explicitly quantify the elasticity of demand for higher education in response to tuition fee changes, instead, they suggest that financial constraints are a major determinant in students' enrollment decisions. Additionally, students who anticipate higher continuation tuition (i.e., tuition fees for students who remain enrolled beyond the expected duration of their degree) in later years may adjust their enrollment choices strategically, selecting institutions or programs that offer greater financial flexibility or more robust scholarship opportunities.

Focusing on Portugal, the evolution of national higher education enrollment demonstrates a progressive increase in access. From 1974 to 2010, the number of students rose significantly (Cerdeira & Cabrito, 2018). However, this growth has not uniformly translated to broader socio-economic inclusivity. Low-income students are still underrepresented, partly due to financial constraints. Furthermore, many potential students from rural or interior regions face geographic and financial barriers that exacerbate disparities in access (Cerdeira & Cabrito, 2018). Thus, financial barriers persist as a critical determinant of accessibility. In fact, enrollment rates slightly declined during the financial crisis of the early 2010s, highlighting the sensitivity of access to economic conditions (Cerdeira & Cabrito, 2018). Nonetheless, the efforts to mitigate these effects, such as the introduction of social scholarships and targeted financial support, have shown positive outcomes. For instance, in the 2022/2023 academic year, over 78 000 social scholarships were awarded, covering a large portion of applicants (Martins et al., 2023). These measures contribute to reducing economic inequalities but fall short of completely addressing systemic financial challenges.

Thus, financial support is presented as a key factor at multiple levels, including government policies, university funding, and family resources. Students from low-socioeconomic backgrounds face significant barriers due to the lack of financial resources, making financial aid programs critical for increasing access (Wanti et al., 2022). In addition, the fear of debt can deter students from enrolling, especially in countries where student loans are a primary means of financing education.

Parental education levels remain a critical factor in determining access to higher education and shaping students' academic and career choices. Students from highly educated families are more likely to attend prestigious institutions and enroll in competitive fields such as health sciences and engineering (Teixeira et al., 2022). This is attributed to greater awareness of the labor market advantages associated with different institutions and degrees, as well as access to additional resources such as private tutoring (Teixeira et al., 2022). In contrast, students from less educated backgrounds often opt for institutions with lower entry requirements, which may affect their future career prospects. Competition for prestigious programs continues to favor students from privileged backgrounds, who have better access to information and resources. Consequently, the role of pre-university institutions in guiding students through financial concerns and enrollment pathways plays an important role, especially for those who come from disadvantaged backgrounds (Wanti et al., 2022). So, institutions considering tuition increases should also implement complementary financial aid programs to prevent potential declines in enrollment. The presence of well-structured financial aid mechanisms can moderate the adverse effects of tuition increases, ensuring that higher education remains accessible to a broader demographic (Garibaldi et al., 2012).

Overall, these indicate that while modest fees may not drastically reduce enrollment, they can exacerbate inequalities among socioeconomically disadvantaged groups who perceive higher education as financially inaccessible.

### **2.3. Tuition fees impact on students ' attainment**

Despite being less explored in literature, the relationship between tuition fees and academic outcomes is equally relevant. Fricke (2018) investigated the effects of a substantial increase in tuition fees at a Swiss university on students' academic achievement. The findings suggest modest effects on metrics such as time-to-degree and academic credit<sup>2</sup> accumulation.

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<sup>2</sup> For higher education across the European Union and other collaborating European countries the term used to refer to academic credits is ECTS and refers to The European Credit Transfer and Accumulation System.

Specifically, students closer to graduation exhibited slight improvements in effort and completion rates in anticipation of higher fees. However, students earlier in their studies displayed weaker performance, potentially due to financial stress and increased reliance on part-time employment. The broader implications of tuition fees on attainment are shaped by students' financial strategies. Studies show that part-time work, often undertaken to mitigate the cost of education, can detract from time available for studying, potentially lowering academic performance (Oosterbeek & van den Broek, 2009). Furthermore, higher fees without adequate financial aid may prolong time-to-degree as students struggle to balance financial and academic responsibilities. Thus, students from lower-income backgrounds face heightened risks of attrition due to financial constraints.

Portugal has made significant progress in educational attainment. The proportion of young adults (25-34) holding a higher education degree increased from 24% in 2010 to 47.5% in 2023, nearing the European target of 50% (Martins et al., 2023). This improvement stems from a combination of policy interventions, including expanded financial aid, increased institutional support, and targeted efforts to reduce dropout rates (Martins et al., 2023). However, this progress is uneven across different socio-economic groups, and the attainment gap persists between affluent and disadvantaged students. Thus, tuition and associated costs can discourage students from completing their studies (Cerdeira & Cabrito, 2018).

## **2.4. Tuition fees impact on students' finances**

Higher education tuition fees represent a financial burden for many students, affecting both their immediate financial circumstances and long-term academic outcomes. The decision to borrow, work part-time, or forgo education entirely is often influenced by tuition fee structures and the availability of financial aid.

While tuition fees can provide much-needed funding for universities, they can also pose a barrier to higher education access. For instance, the introduction of tuition fees in Germany generated additional revenue for universities. However, this financial benefit came at the cost of reduced accessibility for potential students from lower socioeconomic backgrounds (Hübner, 2012). Thus, less affluent students may forego higher education entirely or seek employment alongside studies to offset costs, potentially affecting academic performance and overall well-being.

Additionally, many students prefer part-time work to loans, even when the latter poses as an opportunity to improve their academic outcomes. Also, students with higher parental income borrow less. These reflect a preference for avoiding debt when alternative resources are available (Oosterbeek & van den Broek, 2009).

In a similar way, the financial burden associated with higher education in Portugal encompasses tuition fees and living costs, which collectively strain students and their families. Tuition fees, while relatively moderate compared to some international systems, remain significant when juxtaposed against household incomes. In 2010, the total cost of education per student represented 63.6%<sup>3</sup> of the Portuguese median household income<sup>4</sup> and 33% of PIB *per capita*<sup>5</sup>, only slightly improving to 62.8% and 30.6%, respectively, by 2015 (Cerdeira & Cabrito, 2018). This financial strain is particularly pronounced among lower-income families, where such costs constitute a substantial proportion of disposable income.

The impact of tuition fees extends beyond enrollment and attainment, affecting students' financial outcomes post-graduation (Kirkebøen et al., 2016). High tuition costs lead to greater student debt, which can influence career choices and delay wealth accumulation.

## 2.5. Financial Aid

Tuition fees represent a crucial component of higher education costs but are not the sole determinant of student financial decisions. Other significant financial factors include cost-of-living expenses, availability of financial aid, and family income. While higher tuition fees increase the direct cost of education, they are often counterbalanced by financial aid programs (Havranek et al., 2018).

Frack and Grenet (2015) highlight that the primary financial burden for students arises from living costs, which can be substantial, especially for those studying away from home. To reduce financial obstacles to higher education for low-income students, many countries implement extensive financial aid programs that offer tuition exemptions and direct financial assistance. These initiatives are generally based on financial need, with the amount awarded decreasing as parental income rises. Examples include the Maintenance

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<sup>3</sup> According to data collected from Cerdeira and Cabrito (2018), these percentages represent the total cost spent (encompasses the cost of education and the cost of living) with a student by its family after tax deductions.

<sup>4</sup> The Portuguese median household income, in 2010, is equal to 8823€ and, in 2015, is equal to 8435€ (Cerdeira & Cabrito, 2018).

<sup>5</sup> Portuguese PIB *per capita*, for the years 2010 and 2015, is equal to 17018€ and 17329€, respectively (Cerdeira & Cabrito, 2018).

Grant in the United Kingdom, Spain's Becas program, the Pell Grant in the United States, and France's *Bourses sur critères sociaux* (BCS). Such programs support a significant portion of students, reaching up to one-third of the student population in both the United States and France (Frack & Grenet, 2015). For instance, in France the provision of a €1 500 cash allowance increased college enrollment rates by 5 to 7 percentage points. This implies that financial aid plays a crucial role in determining students' enrollment decisions and it can be attributed to the direct alleviation of financial constraints, which enables more students to afford the cost of living associated with higher education.

Additionally, eligibility for need-based grants affects students differently based on their academic ability. Students in the lower quartile of academic performance see a greater increase in enrollment rates compared to their higher-performing peers (Frack & Grenet, 2015). This suggests that financial support is particularly effective in increasing access for students who may otherwise face significant barriers to entry.

Furthermore, financial aid can influence students' choice of institution. Low-income students who receive grants may be more likely to enroll in universities closer to their homes to minimize living costs (Frack & Grenet, 2015). Conversely, without financial aid, they may either forgo higher education altogether or choose less prestigious institutions due to affordability constraints.

For the institution itself, financial aid is also beneficial. Government financial aid lowers student price sensitivity, allowing colleges to increase tuition without fear of losing applicants (Lin, 2023). This is particularly evident in non-profit and public institutions, where students rely on a mix of government grants, loans, and institutional aid. For-profit institutions, by contrast, experience greater price elasticity since students depend more on student loans, making them more cost-conscious (Lin, 2023). This dynamic benefits institutions, particularly non-profit and public colleges, by providing them with more financial flexibility. This allows them to generate higher revenue, which can be reinvested into faculty salaries, campus infrastructure, research, and student services, ultimately enhancing their reputation and academic offerings. In contrast, for-profit institutions face greater challenges in raising tuition, as their students are more cost-conscious and may opt for more affordable alternatives, limiting their revenue potential and growth (Lin, 2023).

Financial aid mechanisms, such as grants, scholarships, and income-contingent loans, have been shown to mitigate the negative impact of tuition fees on student enrollment



decisions. In countries with extensive financial aid programs, the impact of tuition fees on enrollment tends to be weaker. Additionally, the long-run effects of tuition fees on enrollment are found to be more substantial than short-term effects, as students have more time to adjust their decisions based on financial circumstances and policy changes (Havranek, 2018). The presence of financial aid can help maintain access to higher education for disadvantaged groups, reducing the risk of widening social inequalities in educational attainment. Nonetheless, the effectiveness of these mechanisms varies by demographic factors, with students from lower-income families being more sensitive to tuition increases compared to their higher-income counterparts. The literature also shows that some groups, such as male students and students at private universities, display larger tuition elasticities, indicating that these are more likely to adjust their enrollment decisions in response to changes in tuition fees (Havranek et al., 2018).

These financial support mechanisms enhance student retention and success (Frack & Grenet, 2015). Students from more disadvantaged backgrounds benefit significantly from structured financial aid, allowing them to focus on academic work rather than financial stress. Moreover, university services, such as student accommodation, infrastructure, and learning support programs, further contribute to academic achievement by reducing financial burdens on students. Conjointly, university-level financial aid, mentoring, and academic support programs help disadvantaged students persist and complete their degrees (Wanti et al., 2022). In contrast, students who struggle with financial insecurity are more likely to experience academic difficulties or drop out. The role of social support, such as peer, family, and teacher guidance, in helping students overcome financial-related academic challenges is also relevant. Universities that implement tailored learning strategies for students from disadvantaged backgrounds tend to improve student retention and performance (Wanti et al., 2022).

## **2.6. Heterogeneity across institution type and field of study**

It is evident that higher education tuition fees are a critical determinant of students' enrollment choices, particularly when these fees vary significantly by institution type or field of study. For many students, the prospect of incurring significant debt influences their decision to pursue higher education, as well as their choice of field and institution. Research shows that fields like STEM and business yield substantially higher financial returns, but these programs often come with higher tuition fees, especially at elite institutions (Kirkeboen et al., 2016; Zimmerman, 2019).

The returns to education are significantly influenced by the field of study and the type of institution attended, with notable heterogeneity in labor market outcomes. Research has shown that different fields of study yield vastly different earnings, even after controlling institutional quality and student characteristics. For instance, Kirkebøen et al. (2016) demonstrate that graduates from STEM fields often experience earnings nearly three times higher than those from the humanities early in their careers. Moreover, students from high-return fields, like STEM or business, may have the potential to repay loans more quickly, but those from lower-return fields such as the humanities may struggle, exacerbating financial disparities. Providing tuition subsidies or scholarships for underrepresented students in high-return fields can encourage equitable access and increase economic mobility (Mountjoy, 2022). These differences persist even when accounting for peer quality and institutional selectivity, suggesting that the choice of field itself plays a critical role. Moreover, individuals frequently select fields where they have a comparative advantage, aligning their aptitudes and interests with market demand (Kirkebøen et al., 2016). This self-selection process further amplifies the observed disparities in returns across fields.

The role of community colleges<sup>6</sup> in mitigating the impact of tuition fees is essential (Mountjoy, 2022). These institutions typically offer lower-cost education and provide a lever for students who might otherwise be unable to afford higher education. However, while community colleges increase access, they may reduce the likelihood of attaining a four year degree, particularly for students who could have initially enrolled in a more selective institution. The financial trade-off between upfront tuition savings and potential long term earnings losses underscores the complex relationship between fees, institutional choice, and outcomes (Mountjoy, 2022).

Moreover, the literature shows that elite programs offer significant advantages in accessing top economic positions but are predominantly attended by students from affluent backgrounds (Zimmerman, 2019). The financial burden of tuition fees and the reliance on private funding sources (e.g., loans) create barriers for low-income students, who are less likely to enroll in these programs. This perpetuates inequality, as students from wealthier families are better positioned to leverage the networking opportunities and high returns associated with elite institutions. Expanding access to high-return fields, particularly for

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<sup>6</sup> In the United States, community colleges are publicly funded institutions offering two-year associate degrees and vocational programs, often serving as a bridge to four-year universities. In Europe, similar functions are performed by higher education institutions who offer short-cycle programs, such as Polytechnic Institutes in Portugal.

underrepresented groups, is critical for promoting equity. For instance, targeted initiatives to reduce financial and preparatory barriers to STEM and business fields could help bridge the earnings gap.

Hence both the field of study and the type of institution significantly shape educational and economic outcomes. The relationship between higher education tuition fees and student finances, enrollment, and attainment is deeply intertwined with the heterogeneity in returns by field of study and institution type. Tuition fees shape students' access to education and their choices of where and what to study, which in turn affects their long-term financial outcomes. By understanding these dynamics, policymakers can better design interventions to reduce disparities and enhance the equity and efficiency of the higher education system.

## **2.7. Equity in Higher Education**

The debate over tuition fees is central to discussions on equity in higher education. As stated before, while tuition fees can generate necessary revenue to sustain and expand higher education systems, they can also create financial barriers that disproportionately affect students from disadvantaged backgrounds.

McCowan (2015) highlights that equity in higher education is not simply about the availability of places but also about ensuring that all students, regardless of socioeconomic background, have genuine access to quality education. In this regard, tuition fees can act as both a facilitator and a barrier, depending on how they are structured and whether financial aid mechanisms are in place. Tuition fees influence the ability of students from disadvantaged backgrounds to enter higher education. While affirmative action policies, scholarships, and loan programs attempt to level the playing field, systemic inequalities persist. McCowan's (2015) three-dimensional framework—availability, accessibility, and horizontality—provides a useful lens to evaluate the role of tuition fees in equity. The author states that a fair system must ensure not only that there are enough places to accommodate a significant portion of the demand for higher education (availability) but also that financial and non-financial barriers are addressed (accessibility) and that students have access to institutions of comparable quality and prestige (horizontality). True equity requires addressing both financial and non-financial barriers, such as the quality of prior schooling, social perceptions of belonging in higher education, and geographical disparities (McCowan, 2015).

Higher education in Portugal has expanded significantly in recent years, leading to a more varied institutional landscape (Teixeira et al., 2022). While this growth was intended to create broader opportunities for students, access to higher education remains unequal, particularly for students from disadvantaged socioeconomic backgrounds. The competition for places in top institutions and programs has reinforced existing disparities, making it harder for disadvantaged students to benefit equally from higher education opportunities. In fact, students who attend private secondary schools are more likely to gain admission to competitive programs, as they often have better preparation and resources to excel in entrance exams (Teixeira et al., 2022). Competition for university admission reinforces inequalities, as students with greater financial and educational resources have an edge in securing spots in the most prestigious programs.

Moreover, access to higher education in Portugal is shaped by both socioeconomic background and geography (Teixeira et al., 2022). Students whose parents have university degrees are more likely to secure spots in prestigious institutions and competitive fields, benefiting from financial and social advantages. Meanwhile, universities in major cities like Lisbon and Porto attract more privileged students and offer better career prospects, while polytechnic institutes and institutions in less urbanized areas enroll more first-generation college students but often provide fewer opportunities (Teixeira et al., 2022). These disparities highlight how financial and regional factors continue to influence educational equity. Teixeira et al. (2022) highlight that despite significant growth in Portugal's higher education sector, true equity in access remains a challenge.

To address equity concerns, policymakers should adopt integrative cost-sharing models that balance tuition revenue with robust financial aid mechanisms (European Commission, 2014). Effective strategies include targeted grants, income-contingent loans, and proactive outreach to underrepresented groups (Boliver, 2013). Furthermore, institutional policies should prioritize quality enhancements and equitable resource allocation to ensure that financial reforms do not undermine educational access and outcomes (Marcucci and Johnstone, 2007).

### **3. Data and Descriptives**

#### **3.1. Data**

To conduct this study, the source of data used is EUROSTUDENT survey. Specifically, the most recent edition, the eighth, which was conducted from 2021 to 2024. The EUROSTUDENT project is an international research initiative that has been gathering information about the social and economic aspects of student life across Europe since 1994. The project has conducted eight survey cycles since its inception, each cycle spans approximately three years.

Focused on students enrolled in higher education programs corresponding to ISCED levels 5, 6, and 7, which include short-cycle programs, bachelor's, and master's degrees. It provides comprehensive data on key areas such as access to higher education, students' demographics and educational pathways, study formats, time use and work activities, financial resources and spending, housing situations, and international mobility. The project aims to provide comparative data to inform policymaking and enhance the understanding of student experiences in the European Higher Education Area. This survey round, as well as the previous rounds, adhered to a decentralized network structure, with each country responsible for conducting its national study in alignment with central EUROSTUDENT conventions. This approach ensures data comparability across the participating countries, the large majority being European countries and the rest being countries bordering Europe and Asia, e.g. Azerbaijan. The sample for the eighth edition, across all 25 participating countries combined, is around 290 000 students. The survey covers a wide range of topics, starting with students' demographic and social background, such as age and parental education. Living conditions formed a substantial part of the dataset. Complementing this, the survey explored students' financial situations in depth, examining sources of income including parental support, paid employment and public financial aid. Data was collected on monthly income and expenditures, financial stress, and how students managed financial challenges. The focus is on identifying patterns and differences among European countries in how tuition fees relate to student finances, attainment, and access to higher education.

To analyze the impacts of tuition fees on students' finances, the outcome variable chosen referred to students' self-assessment of financial difficulties. For students' attainment, the outcome variable chosen refers to the self-evaluation of student's

performance compared to fellow students. Lastly, to analyze the impact on students' access to higher education the variable chosen referred to the transition from secondary school to higher education.

In this study, the unit of analysis is the individual student. While the EUROSTUDENT surveys gathered micro-level data from hundreds of thousands of students from all participating countries, the data that is currently available to the public is restricted to a selection of countries. Unfortunately, Portugal<sup>7</sup> it is not included in this analysis. The micro data analysis will focus on the following 18 countries: Austria, Azerbaijan, Croatia, Czechia, Denmark, Finland, Georgia, Germany, Iceland, Ireland, Lithuania, Malta, The Netherlands, Poland, Romania, Slovakia, Sweden and Hungary. Therefore, and accounting for this restriction and for valid responses to the survey, the dataset available to conduct this study comprehends 194758 responses. Table 1 provides a description of all the variables included in the model presented in section 4.

**Table 1 - Variable Description**

| Variable                       | Description                                                                                                                  |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Dependent Variables</b>     |                                                                                                                              |
| Financial Difficulties         | Binary variable equal to 1 if the student reports experiencing financial difficulties.                                       |
| Enrollment                     | Binary variable equal to 1 if the student delayed its transition into tertiary education by more than 2 years.               |
| Attainment                     | Binary variable equal to 1 if the student reports achieving the same or higher academic performance compared to their peers. |
| Financial Difficulties (Proxy) | Binary variable equal to 1 if student reports comfortable parental economic situation.                                       |

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<sup>7</sup> European coordination was very responsive to our request for data access, but unfortunately Portuguese representatives were not responsive. For that reason, we used data from a variety of European countries, as we believe that many of the conclusions can still be applied to Portugal due to the similarity of key structural characteristics in higher education systems — such as low or regulated tuition fees, participation in the Bologna Process, a strong public university sector, and alignment with EU academic mobility and funding frameworks.

|                              |                                                                                                                    |
|------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Enrollment (Proxy)           | Binary variable equal to 1 if student reports serious intention of completely abandoning higher education.         |
| Attainment (Proxy)           | Binary variable equal to 1 if student reports that has always had an intention of enrolling into higher education. |
| <b>Independent Variables</b> |                                                                                                                    |
| Tuition Fees                 | Monthly tuition fees paid by each student (in euros).                                                              |
| Female                       | Dummy equal to 1 if the student identifies as female.                                                              |
| National                     | Dummy equal to 1 if the student holds the nationality of the country in which they are enrolled.                   |
| Mother's HE                  | Dummy equal to 1 if the mother has completed higher education.                                                     |
| Father's HE                  | Dummy equal to 1 if the father has completed higher education.                                                     |
| Living without parents       | Dummy equal to 1 if the student does not live with their parents during the academic year.                         |
| Total Expenses               | Total monthly expenses reported by each student (in euros).                                                        |
| Accommodation                | Monthly expenses on housing/accommodation (in euros).                                                              |
| Food                         | Monthly expenses on food (in euros).                                                                               |
| Transportation               | Monthly expenses on transport (in euros).                                                                          |
| Total Income                 | Total monthly income of the student (in euros).                                                                    |
| Family                       | Income received from the family (in euros).                                                                        |
| Self-earned                  | Income earned from work (in euros).                                                                                |

|                          |                                                                                                                         |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| State                    | Income received from public sources (e.g., scholarships received from the state) (in euros).                            |
| Public Support           | Dummy equal to 1 if the student receives any public financial support.                                                  |
| Worker                   | Dummy equal to 1 if the student is employed during the academic year.                                                   |
| University Status        | Dummy equal to 1 if the student attends a university (vs. a non-university higher education institution).               |
| Study Location (Capital) | Dummy equal to 1 if the student studies in the capital city.                                                            |
| Student Status           | Dummy equal to 1 if the student is a full-time student (vs. part-time students—those who are enrolled in less credits). |
| Studying Hours           | Average number of study hours per week reported by the student.                                                         |

*Source:* Author's elaboration.

Note: Income and expense variables represent the extra costs that respondents' themselves and/or their families or partners regularly pay specifically for them, based on respondents' estimates of bills and in-kind support that are directly attributable to their personal use.

### 3.2. Descriptive Statistics

Table 2 presents a summary of statistics for the main variables used in the analysis. It includes the sample mean, for each variable, as well as mean differences between the national and international groups of students. The mean differences quantify the extent to which national and foreign respondents differ on each characteristic, providing a measure of group disparities.

Across the full sample, women represent a clear majority (63.2%). Age distribution shows that most respondents are under 30, with 28.3% aged up to 21, 33.6% between 22 and 24, and 22.0% between 25 and 29. Only 16.0% of the sample is aged over 30. These figures reflect the typical age profile of students enrolled in tertiary education (OECD, 2023).

In terms of parental education, 44.7% of students report that their mothers hold a college degree, while 45.0% indicate high school as the highest educational level attained. A similar



pattern is observed for fathers, with 42.3% holding a college degree and 44.8% having completed high school. Only around 9% of students report that their parents have less than a high school education, suggesting a relatively high socio-educational background across the student population.

The field of study is notably diverse, with the largest proportions of students enrolled in Business, Administration and Law (18.4%), Health and Welfare (14.6%), and Engineering, Manufacturing and Construction (15.0%). Fewer students are found in fields such as Agriculture (2.3%) and Services (2.2%).

On average, students report monthly housing expenses of €425, food expenses of €239, and transport expenses of €117. Additional costs include €36 for health, €85 for leisure, and €1042 for non-study-related expenses. Study-specific expenses, such as tuition fees and other study-related costs, bring the average total monthly expenditure to €1129. In terms of income, students report an average of €167 from family, €650 from self-earned work, €203 from state support, and €37 from other sources, totaling an average monthly income of €1119. These figures suggest that many students operate close to a financial break-even point, balancing modest incomes with similarly modest but varied expenses.

When comparing national and foreign students, several significant differences emerge. It is important to note that these classifications refer to the citizenship of the student responding to the survey regarding the country where they are studying.

National students are slightly more likely to be female and younger. In contrast, foreign students tend to be older, especially in the 25–29 age group, suggesting that international mobility may be more common among those pursuing graduate studies or engaging in delayed entry into higher education. Foreign students also tend to come from families with higher educational attainment; over half report that their parents have a college degree, compared to slightly lower rates among national students.

The distribution of students across fields of study also varies. Nationals are more concentrated in Education and Health & Welfare, whereas foreign students are more likely to be enrolled in Arts and Humanities, Social Sciences, Natural Sciences.

Economically, foreign students face higher housing (€480 vs. €417) and tuition costs (€114 vs. €58) and spend more on study-related items. However, they tend to spend less on transport, possibly due to centralized housing or campus accommodation. Importantly, foreign students receive significantly less state support (€105 vs. €218), although they report slightly higher contributions from their family and comparable overall income levels. These

figures suggest that foreign students may rely more on family or personal income, while national students benefit more from public funding systems.

**Table 2 - Descriptive Statistics of Valid Survey Dataset**

|                          | Overall  | Mean Difference |          |            |     |
|--------------------------|----------|-----------------|----------|------------|-----|
|                          | Mean     | National        | Foreign  | Difference |     |
| Female                   | .632     | .638            | .594     | .044       | *** |
| Age groups:              |          |                 |          |            |     |
| Up to 21                 | .283     | .291            | .231     | .060       | *** |
| From 22 to 24            | .336     | .339            | .320     | .019       | *** |
| From 25 to 29            | .220     | .209            | .295     | -.086      | *** |
| More than 30             | .160     | .161            | .155     | .006       | *   |
| Mother's highest degree: |          |                 |          |            |     |
| Less than high school    | .085     | .086            | .079     | .007       | *** |
| High school              | .450     | .462            | .373     | .08910     | *** |
| College                  | .447     | .435            | .520     | -.0858     | *** |
| Father's highest degree: |          |                 |          |            |     |
| Less than high school    | .091     | .092            | .085     | 0.001      | **  |
| High school              | .448     | .468            | .323     | 0.145      | *** |
| College                  | .423     | .404            | .542     | -0.138     | *** |
| Field of Study           |          |                 |          |            |     |
| Education                | .100     | .109            | .049     | .066       | *** |
| Arts and humanities      | .109     | .106            | .130     | -.025      | *** |
| Social Sciences, J&I     | .112     | .106            | .151     | -.045      | *** |
| Business, A&L            | .184     | .186            | .169     | .017       | *** |
| Natural Sciences,M&S     | .079     | .076            | .096     | -.020      | *** |
| ICTs                     | .074     | .070            | .097     | -.027      | *** |
| Engineering, M&C         | .150     | .150            | .150     | -5e-05     |     |
| Agriculture, F&V         | .023     | .024            | .015     | .009       | *** |
| Health & welfare         | .147     | .149            | .129     | .020       | *** |
| Services                 | .022     | .022            | .018     | .005       | *** |
| Expenses (Euros/month)   |          |                 |          |            |     |
| Housing                  | 425.250  | 416.564         | 480.402  | -63.837    | *** |
| Food                     | 239.033  | 238.792         | 240.562  | -1.769     |     |
| Transports               | 117.156  | 122.908         | 80.613   | 42.295     | *** |
| Health                   | 35.733   | 35.270          | 38.693   | -3.422     | *** |
| Leisure                  | 85.417   | 85.309          | 86.108   | -0.798     |     |
| Non-study-related        | 1042.013 | 1042.723        | 1037.508 | 5.215      |     |
| Tuition Fees             | 65.576   | 57.991          | 113.720  | -55.729    | *** |
| Study-related            | 87.384   | 80.109          | 133.574  | -53.466    | *** |
| Total expenses           | 1129.398 | 1122.831        | 1171.083 | -48.252    | *** |
| Income (Euros/month)     |          |                 |          |            |     |
| Family                   | 166.637  | 148.584         | 281.230  | -132.650   | *** |
| Self-Earned              | 650.209  | 657.543         | 603.654  | 53.889     | *** |

|               |          |          |          |         |     |
|---------------|----------|----------|----------|---------|-----|
| State Support | 203.015  | 218.392  | 105.399  | 112.993 | *** |
| Other         | 36.511   | 36.752   | 35.002   | 1.750   |     |
| Total Income  | 1119.598 | 1118.728 | 1125.122 | -6.394  |     |
| Observations  | 101433   | 87566    | 13804    |         |     |

*Source:* Author's calculations (using Stata 18).

Notes: National and Foreign indicate whether the student's nationality matches the country where they are currently enrolled, as the dataset includes students from multiple countries. The calculations were done with data that had complete information for nationality. The values used in Expenses and Income are paid by others and/or by student's own pocket. Calculations did not include survey weights. \*\*\*, \*\*, \* represents the statistical significance at  $p < .01$ ,  $p < .05$  and  $p < .1$  respectively.

## 4. Methodology

To address the research question, the study will adopt a quantitative approach, utilizing econometric modeling to estimate the effects of tuition fees on key variables. The study analyses three outcomes: financial difficulties, transition delay as a proxy for enrollment, and educational attainment.

Given the binary nature of the outcome variables, all regressions are estimated using logistic (logit) specifications. The empirical analysis is based on individual-level survey data. Due to item non-response and the need to apply consistent inclusion criteria, the analytical sample is restricted to observations with complete data on all key variables, which represents 37% of the full sample. This restriction may lead to selection bias if respondents with complete cases differ systematically from those with missing data, potentially affecting the generalizability of the findings. Consequently, the results should be interpreted as indicative of associations rather than causal relationships. Thus, the final sample includes responses who meet the following conditions: complete responses for gender, nationality, parental education, income and expenditure components (including tuition fees, total income and expenditure, accommodation, food, transportation), sources of income (family, self-earned, state), institutional characteristics (type of university and capital city residence), student work status and valid responses for all three outcome variables as well as for the fixed effects. The proposed baseline equation is as follows:

$$\log (P(Y_i == 1)) = \beta_0 + \beta_1 \textit{Tuition Fees}_i + X'_i \boldsymbol{\Pi} + \boldsymbol{\gamma}_c + \boldsymbol{\lambda}_f + \boldsymbol{\theta}_p + \boldsymbol{\varepsilon}_i, \quad (1)$$

where  $Y_i$  represents one of the three binary outcomes: financial difficulties (is equal to 1 when the student responds positive for facing financial strain during their studies), attainment (is equal to 1 when the student self-assesses that its attainment is average or above average compared to peers) and transition delay ( is equal to 1 when the student delays its entry into higher education for more than 2 years after completing secondary school);  $\textit{Tuition Fees}_i$  is the tuition fee faced by each student;  $X'_i$  includes student-level covariates;  $\boldsymbol{\gamma}_c$  captures country fixed effects;  $\boldsymbol{\lambda}_f$  captures field of study fixed effects;  $\boldsymbol{\theta}_p$  program level fixed effects, and  $\boldsymbol{\varepsilon}_i$  is the error term.

The student-level covariates are organized into three blocks. Their Individual Characteristics: gender, nationality, parental education, and living situation. Their Financial

Situation: total income and expenditure components all monthly and in euros, such as total income and expenditures (including food, accommodation, and transportation), sources of income (family, self-earned, state) and two binary variables, public support and worker. Lastly, the Institutional Characteristics: university<sup>8</sup> status and studying location, this tries to ensure a more accurate estimation by controlling structural and spatial disparities. However, it was only included for the attainment models a fourth block, as it is particularly relevant to subjective evaluations of academic performance. It included two variables: studying hours and student status. Hence, the models are estimated to sequentially evaluate the role of different explanatory domains, in five stages.

The inclusion of country, program, and field of study fixed effects is crucial to mitigate potential omitted variable bias. Countries differ in their higher education systems, tuition fee structures, and student aid policies; therefore, country fixed effects help isolate within-country variation in tuition exposure. Similarly, students enrolled in different program<sup>9</sup> levels (e.g., bachelor's vs. master's) face distinct financial burdens, academic requirements, and labor market expectations, making program fixed effects necessary to account for this heterogeneity. Additionally, the field of study<sup>10</sup> fixed effects control for differences across disciplines in terms of typical duration of study, workload, earning potential, and access to funding or employment opportunities—factors that may directly influence both students' financial situations and educational outcomes.

For the models estimating financial difficulty and transition delay, clustering of the standard errors is done at the field of study level. For the attainment models, clustering is performed at the program level to reflect within-program variation that may exist due to differences in academic requirements, such as evaluation methods, workload, among others.

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<sup>8</sup> Universities are typically defined as HEIs that can award doctoral degrees, while non-university refers to other types of HEIs, including universities of applied sciences, polytechnics, and professional HEIs (Hauschildt et al., 2024).

<sup>9</sup> Education level of the program based on ISCED 2011: ISCED 6 (bachelor's degree and short national degrees) and ISCED 7 (master's degree, long national/integrated master's programs, other postgraduate degrees). Also includes "Other" (single subject enrollments).

<sup>10</sup> Fields of study are classified according to the broad ISCED-F 2013 categories: Services; Arts and Humanities; Social Sciences, Journalism and Information; Business, Administration and Law; Natural Sciences, Mathematics and Statistics; ICTs (information and communication technologies); Engineering, Manufacturing and Construction; Agriculture, Forestry, Fisheries and Veterinary; Health and Welfare.

## 5. Results

### 5.1. Students' Finances

**Table 3 - Students' Financial Stress (Average Marginal Effects)**

| Variables                      | (1)                  | (2)                   | (3)                   | (4)                   | (5)                   |
|--------------------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Tuition Fees                   | 0.000 ***<br>(0.000) | 0.000 ***<br>(0.000)  | -0.000 **<br>(0.000)  | -0.000 ***<br>(0.000) | -0.000 **<br>(0.000)  |
| Female                         |                      | 0.039 ***<br>(0.008)  | 0.028 ***<br>(0.007)  | 0.027 ***<br>(0.007)  | 0.019 ***<br>(0.007)  |
| National                       |                      | -0.123 ***<br>(0.013) | -0.126 ***<br>(0.011) | -0.128 ***<br>(0.011) | -0.132 ***<br>(0.012) |
| Mother's HE                    |                      | -0.060 ***<br>(0.007) | -0.057 ***<br>(0.005) | -0.055 ***<br>(0.005) | -0.055 ***<br>(0.005) |
| Father's HE                    |                      | -0.074 ***<br>(0.003) | -0.066 ***<br>(0.002) | -0.064 ***<br>(0.002) | -0.062 ***<br>(0.002) |
| Living without parents         |                      | 0.060 ***<br>(0.004)  | 0.069 ***<br>(0.005)  | 0.071 ***<br>(0.005)  | 0.072 ***<br>(0.004)  |
| Total Expenses                 |                      |                       | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Accommodation                  |                      |                       | -0.000<br>(0.000)     | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Food                           |                      |                       | 0.000<br>(0.000)      | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Transportation                 |                      |                       | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Total Income                   |                      |                       | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Family                         |                      |                       | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Self-earned                    |                      |                       | -0.000<br>(0.000)     | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| State                          |                      |                       | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Public Support                 |                      |                       | -0.057 ***<br>(0.009) | -0.058 ***<br>(0.009) | -0.057 ***<br>(0.009) |
| Workers                        |                      |                       | 0.024 ***<br>(0.008)  | 0.024 ***<br>(0.007)  | 0.025 ***<br>(0.008)  |
| University Status              |                      |                       |                       | -0.056 ***<br>(0.009) | -0.049 ***<br>(0.008) |
| Study Location                 |                      |                       |                       | 0.016 ***<br>(0.006)  | 0.014 ***<br>(0.005)  |
| Number of observations         | 71016                | 71016                 | 71016                 | 71016                 | 71016                 |
| Pseudo R-squared <sup>11</sup> | 0.02                 | 0.04                  | 0.07                  | 0.07                  | 0.08                  |

<sup>11</sup> The reported pseudo R-squared values, as well as the following ones, refer to the fit of the underlying logit model.

|            |     |     |     |     |     |
|------------|-----|-----|-----|-----|-----|
| FE Country | Yes | Yes | Yes | Yes | Yes |
| FE Field   |     |     |     |     | Yes |
| FE Program |     |     |     |     | Yes |

*Source:* Author's calculations (using Stata 18).

Note: *FE* means fixed effects.

Table 3 presents the average marginal effects from five logistic regression models, where the dependent variable is a binary indicator equal to 1 if the student reports experiencing financial difficulties during the academic year. The models introduce additional control variables, moving from individual characteristics (2) to detailed financial information (3), institutional characteristics (4), and fixed effects for field of study and program level (5). The sample includes 71 016 responses with complete data on all relevant variables.

The main variable of interest is tuition fees. Across all model specifications, no meaningful effect of tuition fees on financial stress was found. While tuition fees are statistically significant in several models, their estimated marginal effects are effectively zero. As such, the results indicate that tuition fees do not have a substantive impact on students' financial difficulties once other relevant factors are taken into account and on their own.

Regarding individual-level controls, several variables show strong and consistent effects. Female students are significantly more likely to report financial difficulties, with marginal effects ranging from approximately 1.9 to 3.9 percentage points across models. This gender disparity points to potential inequalities in the student experience that may reflect broader socioeconomic patterns. National students are around 12 percentage points less likely to experience financial difficulties compared to international or foreign students, a substantial effect likely reflecting differences in access to social support networks, public subsidies, and familiarity with the local cost structure. Students who do not live with their parents during the academic year are between 6 and 7 percentage points more likely to report financial strain, underscoring the added financial burden of independent living.

Parental education is statistically significant and consistently associated with students' financial stress. Higher levels of both mother's and father's educational attainment are associated with lower reported financial stress across all model specifications. In the fully saturated model (5), students whose mother or father have higher education are less likely to report financial stress by 5 and 6 percentage points, respectively. These suggest that students from more educated households may have more stable economic backgrounds, or stronger intergenerational support structures, all of which can mitigate the experience of financial stress during the academic year.

The models incorporating income and expenditure variables (models 3–5) offer further insight. The zero average marginal effects suggest that these effects are negligible despite their statistical significance. Therefore, these variables do not have an effect on reported financial stress. Additionally, receiving any form of public support is associated with a 5.7 percentage point reduction in the probability of financial difficulties, suggesting that institutional aid plays a protective role.

Institutional characteristics also show meaningful associations. Students attending a university, as opposed to a non-university higher education institution (e.g., polytechnic institutes), are about 5 percentage points less likely to experience financial strain, potentially due to better access to resources or support services. On the other hand, students studying in the capital city are about 1.4 to 1.6 percentage points more likely to report financial difficulties, likely reflecting the higher cost of living in urban centers.

Finally, the inclusion of field of study and program level fixed effects in model (5) does not substantially alter the main results, indicating that the observed relationships are robust to unobserved heterogeneity across disciplines and program levels. Overall, the explanatory power of the models increases with the inclusion of additional variables and fixed effects, as reflected in the pseudo R-squared values, which rise from 0.02 in model (1) to 0.08 in model (5).

## 5.2. Students' Enrollment

**Table 4 - Students' Enrollment (Average Marginal Effects)**

| Variables              | (1)       |  | (2)        |  | (3)        |  | (4)        |  | (5)        |
|------------------------|-----------|--|------------|--|------------|--|------------|--|------------|
| Tuition Fees           | 0.000 *** |  | 0.000 ***  |  | -0.000 *   |  | -0.000     |  | -0.000     |
|                        | (0.000)   |  | (0.000)    |  | (0.000)    |  | (0.000)    |  | (0.000)    |
| Female                 |           |  | -0.015 *   |  | -0.009     |  | -0.011 **  |  | -0.027 *** |
|                        |           |  | (0.008)    |  | (0.007)    |  | (0.006)    |  | (0.004)    |
| National               |           |  | 0.126 ***  |  | 0.091 ***  |  | 0.083 ***  |  | 0.077 ***  |
|                        |           |  | (0.014)    |  | (0.012)    |  | (0.012)    |  | (0.011)    |
| Mother's HE            |           |  | -0.080 *** |  | -0.063 *** |  | -0.055 *** |  | -0.053 *** |
|                        |           |  | (0.008)    |  | (0.006)    |  | (0.004)    |  | (0.003)    |
| Father's HE            |           |  | -0.054 *** |  | -0.041 *** |  | -0.033 *** |  | -0.030 *** |
|                        |           |  | (0.006)    |  | (0.004)    |  | (0.003)    |  | (0.004)    |
| Living without parents |           |  | 0.104 ***  |  | 0.076 ***  |  | 0.078 ***  |  | 0.080 ***  |
|                        |           |  | (0.010)    |  | (0.007)    |  | (0.007)    |  | (0.005)    |
| Total Expenses         |           |  |            |  | 0.000 ***  |  | 0.000 ***  |  | 0.000 ***  |
|                        |           |  |            |  | (0.000)    |  | (0.000)    |  | (0.000)    |
| Accommodation          |           |  |            |  | -0.000 *** |  | -0.000 *** |  | -0.000 *** |
|                        |           |  |            |  | (0.000)    |  | (0.000)    |  | (0.000)    |
| Food                   |           |  |            |  | 0.000      |  | 0.000      |  | 0.000 *    |



|                        |       |       |            |            |            |  |
|------------------------|-------|-------|------------|------------|------------|--|
|                        |       |       | (0.000)    | (0.000)    | (0.000)    |  |
| Transportation         |       |       | 0.000      | -0.000     | -0.000     |  |
|                        |       |       | (0.000)    | (0.000)    | (0.000)    |  |
| Total Income           |       |       | 0.000 ***  | 0.000 ***  | 0.000 ***  |  |
|                        |       |       | (0.000)    | (0.000)    | (0.000)    |  |
| Family                 |       |       | -0.000 *** | -0.000 *** | -0.000 *** |  |
|                        |       |       | (0.000)    | (0.000)    | (0.000)    |  |
| Self-earned            |       |       | -0.000 *** | -0.000 *** | -0.000 *** |  |
|                        |       |       | (0.000)    | (0.000)    | (0.000)    |  |
| State                  |       |       | 0.000 ***  | 0.000 ***  | 0.000 ***  |  |
|                        |       |       | (0.000)    | (0.000)    | (0.000)    |  |
| Public Support         |       |       | -0.037 *** | -0.041 *** | -0.041 *** |  |
|                        |       |       | (0.007)    | (0.005)    | (0.006)    |  |
| Workers                |       |       | 0.016 ***  | 0.018 ***  | 0.017 ***  |  |
|                        |       |       | (0.004)    | (0.003)    | (0.004)    |  |
| University Status      |       |       |            | -0.108 *** | -0.091 *** |  |
|                        |       |       |            | (0.005)    | (0.005)    |  |
| Studying Location      |       |       |            | -0.018 **  | -0.018 **  |  |
|                        |       |       |            | (0.008)    | (0.008)    |  |
| Number of observations | 71016 | 71016 | 71016      | 71016      | 71016      |  |
| Pseudo R-squared       | 0.05  | 0.10  | 0.15       | 0.17       | 0.18       |  |
| FE Country             | Yes   | Yes   | Yes        | Yes        | Yes        |  |
| FE Field               |       |       |            |            | Yes        |  |
| FE Program             |       |       |            |            | Yes        |  |

*Source:* Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

Table 4 presents the average marginal effects from five logistic regression models, where the dependent variable is a binary indicator equal to 1 if the student postpones entry into higher education by more than two years. The models have the same additional controls as the models presented in Table 3.

Tuition fees again show a negligible relationship with delayed entry. Across all models, the estimated marginal effects of tuition fees are effectively zero, indicating no meaningful impact on the likelihood of delayed enrollment. As additional controls for financial status and institutional context are introduced in models (3) to (5), the effect of tuition fees remains statistically insignificant and substantively null. These results suggest that any apparent relationship between tuition fees and enrollment delay is likely explained by students' financial circumstances and institutional factors, rather than tuition fees themselves exerting an independent influence.

Among the individual characteristics, gender shows a small relationship with enrollment patterns. Female students are less likely to delay entry. Across all models the direction of the marginal effect is negative, and in some models statistically significant. In the last specification, model (5), the likelihood of delayed entry is reduced by 2.7 percentage

points compared to male students. This finding suggests that women tend to transition more directly from secondary to tertiary education, potentially reflecting stronger educational motivation or different labor market expectations. Additionally, being a national student, as opposed to international, reduces the probability of delaying enrollment. In model (5), national students are approximately 7.7 percentage points less likely to delay entry, a consistent result across all model specifications. This likely reflects structural advantages for national students, such as more predictable access to the education system, better knowledge of available pathways, and fewer administrative barriers.

Parental education is inversely related to delayed transition. Students whose mothers or fathers have higher education level attainment are less likely to postpone university entry (the marginal effects for maternal and paternal education in the fully specified model are -5.3 and -3.0 percentage points, respectively). These findings highlight the intergenerational influence of educational capital, where children of more educated parents may be better informed, better prepared, or more encouraged to pursue uninterrupted educational trajectories as well as higher levels of education.

Living without parents is associated with a consistently higher likelihood of delaying entry, with a statistically significant marginal effect of 8.0 percentage points in model (5). This likely reflects underlying socioeconomic vulnerabilities (e.g., early independence) that may interrupt or postpone educational progression.

Regarding financial characteristics, no meaningful association between income or expenses and delayed enrollment was found. Although some coefficients are statistically significant, the marginal effects are effectively zero across all models, indicating that neither income nor expenses have a substantive impact on the likelihood of delayed transition.

Public support mechanisms are associated with a reduction in the likelihood of delayed entry. In model (5), public support reduces the probability of delay by 4.1 percentage points. This finding reinforces the policy relevance of such mechanisms in facilitating direct transitions to higher education, especially for students from lower-income backgrounds. Students who work are slightly more likely to delay entry, with the marginal effect reaching 1.7 percentage points in model (5). This may reflect the trade-off between employment and education, where the need to work postpones educational plans. However, the relatively modest magnitude suggests that work is only a partial determinant of delay.

Institutional characteristics also matter. Attending a university is associated with a significantly lower probability of delayed entry. In the final model, this effect is quite

substantial, with a marginal effect of -9.1 percentage points. This may reflect institutional selection dynamics or student aspirations: more academically prepared or better-informed students might plan for and access universities without delay. Additionally, students who study in capital regions are marginally more likely to transition more quickly, probably due to better proximity to universities, transportation, and preparatory resources.

Model fit improves across specifications, as reflected in the pseudo R-squared increasing from 0.05 in model (1) to 0.18 in model (5). This progression confirms the explanatory power added by incorporating financial and institutional variables, as well as fixed effects for field of study and program level.

### 5.3. Students' Attainment

**Table 5 - Students' Attainment (Average Marginal Effects)**

| Variables              | (1)     | (2)       | (3)        | (4)        | (5)        |
|------------------------|---------|-----------|------------|------------|------------|
| Tuition Fees           | 0.000 * | 0.000 *   | 0.000 ***  | 0.000 **   | 0.000 *    |
|                        | (0.000) | (0.000)   | (0.000)    | (0.000)    | (0.000)    |
| Female                 |         | 0.028 *** | 0.029 ***  | 0.026 ***  | 0.009 **   |
|                        |         | (0.009)   | (0.009)    | (0.009)    | (0.004)    |
| National               |         | -0.014    | -0.024 *** | -0.024 *** | -0.015 **  |
|                        |         | (0.009)   | (0.009)    | (0.009)    | (0.006)    |
| Mother's HE            |         | 0.006 *** | 0.006 ***  | 0.011 ***  | 0.013 ***  |
|                        |         | (0.001)   | (0.001)    | (0.002)    | (0.001)    |
| Father's HE            |         | 0.005 *** | 0.006 ***  | 0.010 ***  | 0.012 ***  |
|                        |         | (0.002)   | (0.002)    | (0.003)    | (0.002)    |
| Living without parents |         | 0.002     | 0.001      | 0.002      | -0.002     |
|                        |         | (0.005)   | (0.004)    | (0.004)    | (0.002)    |
| Total Expenses         |         |           | -0.000 **  | -0.000 *** | -0.000 *** |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| Accommodation          |         |           | -0.000     | 0.000      | 0.000      |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| Food                   |         |           | -0.000     | 0.000      | 0.000      |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| Transportation         |         |           | 0.000      | 0.000      | 0.000      |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| Total Income           |         |           | 0.000 ***  | 0.000 ***  | 0.000 **   |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| Family                 |         |           | 0.000      | 0.000 ***  | 0.000 ***  |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| Self-earned            |         |           | -0.000     | -0.000     | -0.000     |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| State                  |         |           | -0.000 *   | -0.000 *   | -0.000     |
|                        |         |           | (0.000)    | (0.000)    | (0.000)    |
| Public Support         |         |           | 0.052 ***  | 0.050 ***  | 0.054 ***  |
|                        |         |           | (0.010)    | (0.010)    | (0.005)    |
| Workers                |         |           | 0.005      | 0.012 *    | 0.003      |
|                        |         |           | (0.007)    | (0.007)    | (0.005)    |

|                        |       |       |       |                       |                       |
|------------------------|-------|-------|-------|-----------------------|-----------------------|
| University Status      |       |       |       | -0.062 ***<br>(0.018) | -0.066 ***<br>(0.002) |
| Studying Location      |       |       |       | -0.008<br>(0.005)     | -0.008 *<br>(0.004)   |
| Student Status         |       |       |       | -0.059 ***<br>(0.013) | -0.051 ***<br>(0.011) |
| Studying Hours         |       |       |       | 0.002 ***<br>(0.000)  | 0.002 ***<br>(0.000)  |
| Number of observations | 71016 | 71016 | 71016 | 71016                 | 71016                 |
| Pseudo R-squared       | 0.01  | 0.01  | 0.02  | 0.03                  | 0.05                  |
| FE Country             | Yes   | Yes   | Yes   | Yes                   | Yes                   |
| FE Field               |       |       |       |                       | Yes                   |
| FE Program             |       |       |       |                       | Yes                   |

Source: Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

Table 5 reports the average marginal effects from five logistic regression models, where the dependent variable is a binary indicator equal to 1 if the student reports achieving the same or higher academic performance compared to their peers. The models are sequentially specified, beginning with individual characteristics in model (2), followed by the inclusion of detailed financial information in model (3). Model (4) further incorporates institutional characteristics and measures of academic engagement—this set of variables differs from those used in the previous models addressing enrollment and financial difficulties. Finally, model (5) adds fixed effects for field of study and program level.

Across all model specifications, tuition fees do not have a meaningful impact on student attainment. Although some models show statistically significant coefficients, the marginal effects are effectively zero, indicating no substantive association between tuition fees and academic performance. Consequently, the results do not support the notion that higher tuition fees are linked to better student outcomes through mechanisms such as improved institutional quality or increased student commitment.

Gender again plays a substantial role in explaining academic outcomes. Female students are significantly more likely to report higher academic results across all model specifications. In the most saturated model (model 5), being female is associated with a 0.9 percentage point increase in the probability of reporting higher attainment than their peers, suggesting that female students may be more academically motivated, disciplined, or structurally supported in navigating higher education pathways. In contrast, being a national student is associated with a slightly lower probability of reporting higher attainment. Though statistically insignificant in early models, the effect becomes significant and negative from model (3)

onward. In model (5), national students are 1.5 percentage points less likely to report higher academic results compared to international students. This finding may reflect differences in preparation, support, or motivation between national and international students.

Parental education levels show a positive and statistically significant relationship with academic attainment. Higher education levels of maternal and paternal education attainment correspond to a higher likelihood of higher academic results. In model (5), the marginal effects are 1.3 and 1.2 percentage points, respectively. These results underscore the role of intergenerational cultural capital and academic support: students from more educated families may benefit from higher academic expectations, more effective study habits, or more robust educational guidance. Living without parents does not appear to significantly affect academic attainment, and its marginal effect remains statistically insignificant across all models. This suggests that while early independence may be disruptive for transitions (as seen in Table 4), it does not substantially alter performance once students are enrolled.

Regarding financial variables, expenses and income have average marginal effects equal to zero and therefore have no substantive impact on the likelihood of higher academic results.

Public support programs emerge as one of the most robust predictors of academic attainment. Across all models, public support is associated with a large and statistically significant increase in the likelihood of reporting higher attainment. In model (5), the marginal effect is 5.4 percentage points, highlighting the critical role of targeted financial aid in promoting academic success. Employment status does not influence attainment, as the estimated marginal effects are small and mostly statistically insignificant across models.

Institutional characteristics play an important role in shaping outcomes. Students attending universities are less likely to report higher attainment. The negative effect, around 6.6 percentage points in model (5), may reflect differences in academic rigor and curriculum intensity from these institutions. Similarly, studying in a location different from one's home region slightly reduces the probability of on-time completion, possibly due to adaptation challenges or greater independence-related stress.

Student status also has an influence on attainment. Part-time students are significantly less likely to report higher attainment than their peers. Additionally, the number of weekly study hours is positively associated with academic success, with each additional hour marginally improving the likelihood of reporting better academic results, by 0.2 percentage

points in model (5). Though the magnitude of this effect is small, it suggests that consistent academic engagement pays off over time.

Model fit, as indicated by the pseudo R-squared, increases progressively across specifications—from 0.01 in the first model to 0.05 in the last. While the overall explanatory power remains modest the incremental increases confirm the value of including detailed financial and institutional controls.

#### 5.4. Robustness Check

The following robustness checks aim to ensure that the core conclusions do not rely on a particular model setup or operationalization of the outcome variables. In order to assess the robustness of the main findings, a set of alternative model specifications and outcome definitions is employed for each of the three main outcomes: student finances, enrollment, and attainment. For each outcome, the most comprehensive logistic regression model is re-estimated with the inclusion of an interaction term between tuition fees and public financial support. This interaction is intended to test whether the effect of tuition fees differs depending on whether the student receives public support.

**Table 6 – Student’s Financial Stress: Interaction Variable (Average Marginal Effects)**

| Variables              | (1)                   | (2)                   |
|------------------------|-----------------------|-----------------------|
| Tuition Fees           | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Public support         | -0.060 ***<br>(0.009) | -0.061 ***<br>(0.011) |
| Interaction Variable   |                       | 0.000<br>(0.000)      |
| Female                 | 0.019 **<br>(0.010)   | 0.019 **<br>(0.010)   |
| National               | -0.134 ***<br>(0.011) | -0.135 ***<br>(0.011) |
| Mother’s HE            | -0.016 ***<br>(0.001) | -0.016 ***<br>(0.001) |
| Father’s HE            | -0.015 ***<br>(0.002) | -0.015 ***<br>(0.002) |
| Living without parents | 0.060 ***<br>(0.006)  | 0.060 ***<br>(0.006)  |
| Total Expenses         | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Accommodation          | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Food                   | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Transportation         | -0.000 ***            | -0.000 ***            |

|                        |            |  |            |  |
|------------------------|------------|--|------------|--|
|                        | (0.000)    |  | (0.000)    |  |
| Total Income           | -0.000 *** |  | -0.000 *** |  |
|                        | (0.000)    |  | (0.000)    |  |
| Family                 | -0.000 *** |  | -0.000 *** |  |
|                        | (0.000)    |  | (0.000)    |  |
| Self-earned            | -0.000     |  | -0.000     |  |
|                        | (0.000)    |  | (0.000)    |  |
| State                  | 0.000 ***  |  | 0.000 ***  |  |
|                        | (0.000)    |  | (0.000)    |  |
| Workers                | 0.025 ***  |  | 0.025 ***  |  |
|                        | (0.006)    |  | (0.006)    |  |
| University Status      | -0.054 *** |  | -0.054 *** |  |
|                        | (0.010)    |  | (0.010)    |  |
| Studying Location      | 0.012 **   |  | 0.012 **   |  |
|                        | (0.006)    |  | (0.006)    |  |
| Number of observations | 32049      |  | 32049      |  |
| Interaction            | No         |  | Yes        |  |

*Source:* Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

The results from the robustness analysis assessing the effect of tuition fees and financial support on students' likelihood of reporting financial difficulties are presented in Table 6. In both model specifications, without and with interaction terms, the marginal effect of tuition fees remains effectively zero and statistically insignificant, indicating no meaningful relationship between tuition levels and financial stress after controlling other factors. Public financial support, by contrast, shows a robust and statistically significant effect: students who receive public support are approximately 6.0 to 6.1 percentage points less likely to report financial difficulties. The interaction between tuition fees and public support is not statistically significant, suggesting that the effect of tuition fees does not differ depending on support status. The consistency of marginal effects across both models reflects a good degree of model stability. Predictors such as gender, residence, and socioeconomic background exhibit similar patterns in both specifications.

While the interaction is not statistically significant, its inclusion helps confirm that the main effect of public support remains strong and that the burden of tuition fees does not differ substantially between supported and unsupported students, at least within the used framework.

**Table 7 - Student's Enrollment: Interaction Variable (Average Marginal Effects)**

| Variables              | (1)                   | (2)                   |
|------------------------|-----------------------|-----------------------|
| Tuition Fees           | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Public support         | -0.034 ***<br>(0.010) | -0.036 ***<br>(0.010) |
| Interaction Variable   |                       | 0.000 **<br>(0.000)   |
| Female                 | -0.031 ***<br>(0.004) | -0.030 ***<br>(0.004) |
| National               | 0.062 ***<br>(0.012)  | 0.062 ***<br>(0.012)  |
| Mother's HE            | -0.016 ***<br>(0.000) | -0.016 ***<br>(0.000) |
| Father's HE            | -0.008 ***<br>(0.001) | -0.008 ***<br>(0.001) |
| Living without parents | 0.069 ***<br>(0.005)  | 0.069 ***<br>(0.005)  |
| Total Expenses         | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Accommodation          | -0.000 **<br>(0.000)  | -0.000 **<br>(0.000)  |
| Food                   | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Transportation         | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Total Income           | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Family                 | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Self-earned            | -0.000 **<br>(0.000)  | -0.000 **<br>(0.000)  |
| State                  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Workers                | 0.017 ***<br>(0.005)  | 0.017 ***<br>(0.005)  |
| University Status      | -0.081 ***<br>(0.006) | -0.081 ***<br>(0.006) |
| Studying Location      | -0.018 ***<br>(0.005) | -0.018 ***<br>(0.005) |
| Number of observations | 42248                 | 42248                 |
| Interaction            | No                    | Yes                   |

*Source:* Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

The results from the robustness analysis examining the impact of tuition fees and public financial support on the likelihood of enrollment delay are shown in Table 7. Tuition fees alone have a marginal effect equal to zero in both models and are statistically insignificant, suggesting that variations in tuition do not directly influence the probability of delayed



enrollment across the student population. Public financial support, however, displays a consistent and statistically significant protective effect: students receiving public support are approximately 3.4 to 3.6 percentage points less likely to delay their transition to higher education. The interaction between tuition fees and public support is statistically significant but negligible in magnitude. Even though the interaction term achieves statistical significance, its null magnitude suggests that the influence of tuition fees on enrollment delay does not differ between students with and without public financial support within the studied context.

Additionally, key predictors such as gender, nationality and parental education show similar effects in both specifications. Female students are about 3 percentage points less likely to experience enrollment delay, while national students have a 6.2 percentage point higher probability of delay. Furthermore, work status slightly increases delay risk, whereas studying location and university status show modest reductions in delay probability.

**Table 8 - Student's Attainment: Interaction Variable (Average Marginal Effects)**

| Variables              | (1)        | (2)        |
|------------------------|------------|------------|
| Tuition Fees           | 0.000 *    | 0.000 **   |
|                        | (0.000)    | (0.000)    |
| Public Support         | 0.424 ***  | 0.441 ***  |
|                        | (0.046)    | (0.042)    |
| Interaction variable   |            | -0.000 **  |
|                        |            | (0.000)    |
| Female                 | 0.042 ***  | 0.041 ***  |
|                        | (0.014)    | (0.014)    |
| National               | -0.058     | -0.057     |
|                        | (0.043)    | (0.042)    |
| Mother's HE            | 0.016 *    | 0.015 *    |
|                        | (0.009)    | (0.009)    |
| Father's HE            | 0.029 ***  | 0.029 ***  |
|                        | (0.008)    | (0.008)    |
| Living without parents | 0.004      | 0.004      |
|                        | (0.031)    | (0.031)    |
| Total Expenses         | -0.000 *** | -0.000 *** |
|                        | (0.000)    | (0.000)    |
| Accommodation          | 0.000      | 0.000      |
|                        | (0.000)    | (0.000)    |
| Food                   | 0.000      | 0.000      |
|                        | (0.000)    | (0.000)    |
| Transportation         | 0.000      | 0.000      |
|                        | (0.000)    | (0.000)    |
| Total Income           | 0.000      | 0.000      |
|                        | (0.000)    | (0.000)    |
| Family                 | 0.000 ***  | 0.000 ***  |
|                        | (0.000)    | (0.000)    |

|                        |                   |     |                   |     |
|------------------------|-------------------|-----|-------------------|-----|
| Self-earned            | 0.000<br>(0.000)  |     | 0.000<br>(0.000)  |     |
| State                  | -0.000<br>(0.000) | *** | -0.000<br>(0.000) | *** |
| Working hours          | 0.000<br>(0.066)  |     | 0.002<br>(0.066)  |     |
| University Status      | -0.456<br>(0.010) | *** | -0.455<br>(0.010) | *** |
| Studying Location      | -0.034<br>(0.037) |     | -0.035<br>(0.037) |     |
| Student Status         | -0.041<br>(0.010) | *** | -0.041<br>(0.010) | *** |
| Studying Hours         | 0.014<br>(0.001)  | *** | 0.014<br>(0.001)  | *** |
| Number of observations | 42248             |     | 42248             |     |
| Pseudo R-squared       | 0.04              |     | 0.04              |     |
| Interaction            | No                |     | Yes               |     |

*Source:* Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

Table 8 presents the results of the robustness checks examining the relationship between tuition fees, public financial support, and students' self-reported academic attainment relative to their peers.

Tuition fees display a negligible marginal effect in both models, indicating that the real-world impact of tuition levels on students' perceived academic performance is null. Public financial support, by contrast, shows a strong and consistent positive effect: students receiving public aid are approximately 42.4 to 44.1 percentage points more likely to report outperforming their peers. This underlines the critical role of financial support in fostering students' academic confidence and success.

In model (2), the inclusion of the interaction term between tuition fees and public support yields a null effect. This indicates that there is no meaningful evidence that the relationship between tuition fees and attainment differs for students receiving public support. Overall, the practical impact of this interaction is negligible.

The main determinants of attainment remain statistically consistent across both models, indicating a high degree of robustness in the results. For example, parental education exhibits a modest but statistically significant positive marginal effect, reinforcing the positive link between family educational background and academic success.

Additionally, robustness is further assessed by estimating the models using alternative dependent variables that capture related but distinct dimensions of each outcome. In the case of students' financial situation, in addition to the primary binary variable indicating

financial stress, an alternative outcome specification is estimated using a binary indicator of whether the students' parents have a comfortable economic situation. For enrollment, the alternative outcome specification is estimated using a binary indicator of whether the student has always had an intention of enrolling into higher education. Finally, for educational attainment, the alternative outcome specification is estimated using a binary indicator of whether the student has seriously considered abandoning completely higher education. These alternative outcomes capture a different dimension of students' educational trajectories, providing a complementary perspective on academic variables.

**Table 9 – Students' Financial Stress: Comparison between two different outcomes (Average Marginal Effects)**

| Variables              | (1)                   | (2)                   |
|------------------------|-----------------------|-----------------------|
| Tuition Fees           | -0.000 **<br>(0.000)  | -0.000 ***<br>(0.000) |
| Female                 | 0.019 ***<br>(0.007)  | -0.011 ***<br>(0.003) |
| National               | -0.132 ***<br>(0.012) | -0.068 ***<br>(0.004) |
| Mother's HE            | -0.055 ***<br>(0.005) | -0.084 ***<br>(0.003) |
| Father's HE            | -0.062 ***<br>(0.002) | -0.113 ***<br>(0.003) |
| Living without parents | 0.072 ***<br>(0.004)  | 0.011 **<br>(0.005)   |
| Total Expenses         | 0.000 ***<br>(0.000)  | 0.000 **<br>(0.000)   |
| Accommodation          | -0.000<br>(0.000)     | 0.000 *<br>(0.000)    |
| Food                   | 0.000<br>(0.000)      | 0.000 ***<br>(0.000)  |
| Transportation         | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Total Income           | -0.000 ***<br>(0.000) | 0.000<br>(0.000)      |
| Family                 | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Self-earned            | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| State                  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Public Support         | -0.057 ***<br>(0.009) | 0.006<br>(0.004)      |
| Workers                | 0.025 ***<br>(0.008)  | 0.012 **<br>(0.005)   |
| University Status      | -0.049 ***<br>(0.008) | 0.002<br>(0.004)      |
| Studying Location      | 0.014 ***             | 0.012 **              |

|                        |         |         |
|------------------------|---------|---------|
|                        | (0.005) | (0.005) |
| Number of observations | 71016   | 43897   |
| Pseudo R-squared       | 0.08    | 0.12    |
| FE Country             | Yes     | Yes     |
| FE Field               | Yes     | Yes     |
| FE Program             | Yes     | Yes     |

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*Source:* Author's calculations (using Stata 18).  
\*\*\* p<.01, \*\* p<.05, \* p<.1

Table 9 presents a side-by-side comparison of the average marginal effects from the most saturated models of financial vulnerability: The main specification model is presented in the first column and the alternative outcome model in the second column.

The results reveal a high degree of consistency across the two models, both in terms of the direction and statistical significance of the estimated marginal effects. Tuition fees, the key variable of interest, exhibit estimated average marginal effects effectively zero. This indicates that higher tuition fees are not meaningfully associated with increased financial vulnerability, whether measured by students' self-reported financial stress or parental economic background. Despite statistical significance, the practical impact of tuition fees on financial vulnerability appears negligible.

Several individual-level characteristics also demonstrate robust associations across both specifications. Female students have a positive average marginal effect on the probability of reporting financial stress in the main model, yet a significantly negative marginal effect on the probability of reporting parental financial comfort in the alternative model. National students have a significantly negative average marginal effect on the probability of experiencing financial stress and also on the probability of reporting parental financial comfort. This seemingly paradoxical result may indicate that while domestic students benefit from structural advantages (e.g., local cost of living, social networks), they may disproportionately come from lower-income backgrounds compared to international peers.

Parental education is strongly associated with both outcomes. Higher educational attainment among mothers and fathers significantly reduces the probability of financial stress and increases the probability of reporting parental comfort, highlighting the intergenerational dimension of socioeconomic status. Household arrangements also play a role. Students living without their parents have a positive average marginal effect on the probability of experiencing financial stress, though this effect is weaker when predicting parental financial

comfort. This suggests that living independently may contribute more directly to financial stress than to perceived background wealth.

Regarding income and expenditure, both models show no impact. A divergence is observed in the role of public support: while it significantly reduces the probability of financial stress in the main model, it is not statistically significant in the alternative specification. This may suggest that public support alleviates immediate financial pressure but does not necessarily correlate with broader perceptions of household wealth.

Finally, institutional and contextual characteristics show relatively stable effects. University status has a negative average marginal effect on the probability of financial stress but is not statistically significant related to parental comfort, while study location has a positive marginal effect on both outcomes, albeit with modest effect sizes.

**Table 10 - Students' Enrollment: Comparison between two different outcomes (Average Marginal Effects)**

| Variables              | (1)                   | (2)                   |
|------------------------|-----------------------|-----------------------|
| Tuition Fees           | -0.000<br>(0.000)     | 0.000 *<br>(0.000)    |
| Female                 | -0.027 ***<br>(0.004) | 0.037 ***<br>(0.003)  |
| National               | 0.077 ***<br>(0.011)  | -0.063 ***<br>(0.008) |
| Mother's HE            | -0.053 ***<br>(0.003) | 0.069 ***<br>(0.003)  |
| Father's HE            | -0.030 ***<br>(0.004) | 0.065 ***<br>(0.004)  |
| Living without parents | 0.080 ***<br>(0.005)  | -0.026 ***<br>(0.007) |
| Total Expenses         | 0.000 ***<br>(0.000)  | -0.000<br>(0.000)     |
| Accommodation          | -0.000 ***<br>(0.000) | 0.000<br>(0.000)      |
| Food                   | 0.000 *<br>(0.000)    | 0.000<br>(0.000)      |
| Transportation         | -0.000<br>(0.000)     | -0.000 ***<br>(0.000) |
| Total Income           | 0.000 ***<br>(0.000)  | -0.000<br>(0.000)     |
| Family                 | -0.000 ***<br>(0.000) | 0.000 ***<br>(0.000)  |
| Self-earned            | -0.000 ***<br>(0.000) | -0.000<br>(0.000)     |
| State                  | 0.000 ***<br>(0.000)  | -0.000 ***<br>(0.000) |
| Public Support         | -0.041 ***<br>(0.006) | 0.015 ***<br>(0.005)  |

|                        |                       |                      |
|------------------------|-----------------------|----------------------|
| Workers                | 0.017 ***<br>(0.004)  | -0.003<br>(0.002)    |
| University Status      | -0.091 ***<br>(0.005) | 0.029 ***<br>(0.010) |
| Studying Location      | -0.018 **<br>(0.008)  | 0.024 ***<br>(0.004) |
| Number of observations | 71016                 | 43897                |
| Pseudo R-squared       | 0.18                  | 0.16                 |
| FE Country             | Yes                   | Yes                  |
| FE Field               | Yes                   | Yes                  |
| FE Program             | Yes                   | Yes                  |

*Source:* Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

To further examine the robustness of the enrollment model, Table 10 presents a comparison of average marginal effects derived from two specifications. Model (1) focuses on students reporting delayed enrollment in higher education, while model (2) focus on students' intention to pursue higher education.

Tuition fees display statistical significance in model (2) but not in model (1). However, the marginal effect is effectively zero in both cases. This suggests that tuition fees do not have a meaningful impact on either students' intentions or actual delays.

Gender effects remain robust but vary in direction across models. Being female is associated with a lower probability of delayed enrollment in model (1) and a higher probability of reporting consistent educational intentions in model (2). These findings are directionally coherent, reinforcing the interpretation that female students tend to express stronger commitment to higher education and are less likely to postpone their entry.

Nationality status and parental education yield consistent and aligned results across both models. National students are more likely to delay enrollment, model (1) and less likely to report consistent intentions to pursue higher education, model (2). Similarly, higher educational attainment among mothers and fathers is associated with a lower probability of delayed enrollment and a higher probability of persistent enrollment intentions. These results underscore the influence of family background and intergenerational transmission of educational values. Living arrangements display significance in both models but with opposite signs. This suggests that independent living may impose additional constraints. Conversely, financial variables show a negligible effect on both outcomes. Public support consistently shows a protective effect across both models: it significantly reduces the likelihood of enrollment delays and increases the probability of persistent higher education intentions.

Institutional and contextual variables perform robustly across specifications. University status is negatively associated with delayed enrollment and positively associated with early intention, suggesting that students at more prestigious or better-resourced institutions are better positioned to plan and pursue higher education without delay. Studying location has similar effects, reinforcing the importance of contextual access and opportunity structures. Field of study and program fixed effects are included in both models, controlling for variation in academic trajectories. Overall, the similarity in explanatory power, as reflected in comparable pseudo R-squared values, strengthens the robustness of the original findings.

**Table 11 - Students' Attainment: Comparison between two different outcomes (Average Marginal Effects)**

| Variables              | (1)        | (2)        |
|------------------------|------------|------------|
| Tuition Fees           | 0.000 *    | 0.000      |
|                        | (0.000)    | (0.000)    |
| Female                 | 0.009 **   | 0.003 **   |
|                        | (0.004)    | (0.001)    |
| National               | -0.015 **  | 0.013 ***  |
|                        | (0.006)    | (0.002)    |
| Mother's HE            | 0.013 ***  | 0.004      |
|                        | (0.001)    | (0.003)    |
| Father's HE            | 0.012 ***  | 0.009 ***  |
|                        | (0.002)    | (0.002)    |
| Living without parents | -0.002     | 0.002      |
|                        | (0.002)    | (0.002)    |
| Total Expenses         | -0.000 *** | -0.000 *** |
|                        | (0.000)    | (0.000)    |
| Accommodation          | 0.000      | -0.000     |
|                        | (0.000)    | (0.000)    |
| Food                   | 0.000      | 0.000      |
|                        | (0.000)    | (0.000)    |
| Transportation         | 0.000      | 0.000      |
|                        | (0.000)    | (0.000)    |
| Total Income           | 0.000 **   | 0.000 ***  |
|                        | (0.000)    | (0.000)    |
| Family                 | 0.000 ***  | 0.000 ***  |
|                        | (0.000)    | (0.000)    |
| Self-earned            | -0.000     | -0.000 *** |
|                        | (0.000)    | (0.000)    |
| State                  | -0.000     | -0.000     |
|                        | (0.000)    | (0.000)    |
| Public Support         | 0.054 ***  | 0.013 ***  |
|                        | (0.005)    | (0.004)    |
| Workers                | 0.003      | 0.000      |
|                        | (0.005)    | (0.003)    |
| University Status      | -0.066 *** | -0.001     |
|                        | (0.002)    | (0.001)    |
| Studying Location      | -0.008 *   | 0.000      |

|                        |            |  |           |  |
|------------------------|------------|--|-----------|--|
|                        | (0.004)    |  | (0.001)   |  |
| Student Status         | -0.051 *** |  | -0.018 ** |  |
|                        | (0.011)    |  | (0.007)   |  |
| Studying Hours         | 0.002 ***  |  | 0.001 *** |  |
|                        | (0.000)    |  | (0.000)   |  |
| Number of observations | 71016      |  | 43832     |  |
| Pseudo R-squared       | 0.05       |  | 0.05      |  |
| FE Country             | Yes        |  | Yes       |  |
| FE Field               | Yes        |  | Yes       |  |
| FE Program             | Yes        |  | Yes       |  |

*Source:* Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

Table 11 presents a robustness analysis of the academic attainment model by comparing average marginal effects from two specifications: the main model, which uses self-reported academic success as the outcome, and an alternative model, which proxies academic vulnerability through students' consideration of dropping out.

The results demonstrate a consistent pattern of associations across both models. The marginal effect of tuition fees is zero. This suggests that tuition fees do not significantly affect students' self-reported academic success or their intentions of dropping out.

Several individual characteristics display robust associations. Being female is positively associated with higher academic attainment and with a lower likelihood of dropout, indicating a gender-based advantage in both achievement and persistence. National students report higher attainment but are also more likely to consider dropping out in the alternative model. This divergence may reflect greater academic integration among domestic students coupled with higher pressure or expectations that influence dropout contemplation. Parental education, especially that of the father, is positively associated with attainment in both specifications, underscoring the intergenerational transmission of educational advantages.

Financial circumstances are negligible. Public support emerges as a positive predictor in both models, suggesting that targeted assistance programs play a vital role in promoting academic continuity and achievement. The magnitude and consistency of this effect underscores its potential as a policy lever for mitigating academic unsuccess among financially vulnerable students.

Overall, the comparative evidence in Table 11 reinforces the robustness of the original model. The consistent direction and statistical significance of key variables across both specifications suggest that the main findings are not sensitive to the operational definition of academic success.



## 6. Final Considerations

This dissertation sets out to examine the impact of tuition fees on students' finances, enrollment decisions, and academic attainment across a diverse set of European higher education systems. The findings contribute with empirical evidence to a longstanding policy debate surrounding equity in higher education.

The empirical results indicate that the substantive effect of tuition fees on students' reported financial difficulties is null. Across all model specifications, the average marginal effects remain zero, meaning that variations in tuition fees do not alter the likelihood of experiencing financial stress. This counterintuitive result may be interpreted in different ways. First, it is plausible that existing financial aid systems, particularly public support, are effective in mitigating the direct financial burden imposed by tuition fees. The presence of substantial public support reduces the net cost of education, especially for students from lower-income backgrounds, thus buffering the impact of tuition fees on financial well-being. In fact, the mitigating effect of public financial support was clear: students receiving aid were less likely to report financial difficulties. This confirms the findings by Oosterbeek and van den Broek (2009), who argue that state transfers, even modest ones, can buffer students from acute financial stress. Second, students attending HEI may disproportionately belong to more socioeconomically advantaged groups or may be more likely to secure scholarships or parental support in advance.

However, other variables displayed robust and meaningful associations with financial stress. Gender, parental education and living arrangements all emerged as significant predictors. Female students and those living away from their parents reported higher financial difficulty. These findings mirror the ones of Wanti et al. (2022), who stress the multidimensional nature of financial strain and the interaction between household background and institutional costs. Thus, tuition fees constitute only one component, often a secondary one, within the students' broader financial landscape.

The second dimension of analysis concerned the relationship between tuition fees and enrollment timing, operationalized through the presence of delays exceeding two years between secondary education and tertiary education entry. Across all models, tuition fees do not exert an influence on enrollment, mirroring the findings of Havranek et al. (2018). The null effect of tuition fees suggests that other variables such as gender, public support, and employment status act as more proximal determinants of enrollment timing. In particular,

public financial aid was found to be a significant protective factor, reducing the likelihood of transition delays by approximately 4 percentage points. This implies that while tuition fees may represent a symbolic or psychological barrier to immediate enrollment, it is the broader structure of financial support and family resources that ultimately determines students' capacity to transition continuously into the higher education system. Notably, parental education once again emerged as a strong predictor, with students from highly educated families more likely to enter higher education directly. These findings align with previous literature (Teixeira et al., 2022) on educational inheritance and reinforce the notion that structural inequalities in access may persist despite attempts to level the playing field through financial aid.

With respect to academic attainment, operationalized through self-assessed performance relative to peers, tuition fees were again substantively null. Across specifications, the effect size remained negligible, with tuition marginal effects equal to zero—indicating no meaningful impact on students' academic self-assessment. This supports broader findings in the literature that remain ambivalent about the effect of tuition fees on academic success.

Nevertheless, public support was again shown to exert a positive effect. Students receiving financial aid were significantly more likely to report higher academic performance, suggesting that targeted support mechanisms may enhance student engagement and success by alleviating financial stress and enabling greater focus on academic work. Furthermore, the results underscore the importance of academic engagement and institutional characteristics. Full-time students and those studying more hours per week were more likely to report high attainment. Students enrolled in universities, as opposed to other tertiary institutions, reported slightly lower self-assessed performance, perhaps reflecting higher academic rigor or differences in grading standards. Other variables were positively associated with attainment like parental education and gender, while variables such as national status were negatively associated with attainment.

Collectively, the findings suggest that tuition fees, while symbolically significant and politically contentious, do not exert a uniformly large or consistent effect on students' financial conditions, enrollment patterns, or academic performance. Instead, these outcomes are more directly shaped by a group of socioeconomic factors—particularly public financial aid, gender, and parental education. Nevertheless, this conclusion does not guarantee complacency regarding tuition policy. Although the direct effects of tuition fees may be

limited, their interaction with other structural variables remains significant. In particular, the effectiveness of financial aid systems in mitigating adverse effects is crucial. Countries where public support is robust and well-structured, students appear better equipped to navigate the financial demands of higher education, which in turn can buffer the potential adverse effects of tuition fees. These findings support the view that equity in higher education financing depends less on eliminating tuition altogether and more on ensuring that financial aid reaches those most vulnerable to educational exclusion.

Furthermore, the persistent significance of demographic variables—such as gender and parental education—highlights the enduring nature of inequality in higher education. Tuition fees may not be the primary driver of this inequality, but they are embedded within a system where cumulative disadvantage can shape student trajectories in various ways.

From a policy perspective, this research underscores the importance of complementing tuition fee structures with effective financial aid programs, especially those that are targeted and easy to access. Policymakers should also consider non-financial barriers to promote equity, such as access to preparatory education, institutional diversity, and geographic disparities. Altering tuition fee policies without simultaneously strengthening support systems may yield limited benefits.

While this study provides valuable empirical evidence on the role of tuition fees using a robust logistic regression framework, future research could further strengthen these findings by employing alternative econometric techniques and more granular datasets. In particular, the application of Ordinary Least Squares regression models, especially in contexts where continuous measures of financial stress, academic performance, or number of enrollments per year are available—could yield more nuanced insights into the magnitude and direction of tuition fee effects. This type of estimation would allow for the interpretation of coefficients in absolute terms, facilitating clearer policy translation and comparability across contexts. Additionally, the availability of richer country-specific administrative datasets or longitudinal survey data, particularly including information on Portugal—which, as mentioned before, was unavailable in this study—would enable researchers to capture causal relationships or indicative associations with greater precision. Such extensions would contribute to a deeper understanding of how tuition policies interact with broader economic and educational structures to shape students' trajectories. However, despite the absence of Portuguese microdata in the empirical component of this dissertation, the findings remain relevant for the national context. The analysis underlines the importance of factors such as

parental education, public financial support, and overall socioeconomic background—factors that are also highly relevant in Portugal, as emphasized in national reports (Martins et al., 2023). In line with the literature reviewed, financial constraints in Portugal continue to pose barriers for students from disadvantaged backgrounds, and the evidence presented here reinforces the role of public financial aid in mitigating these challenges. Therefore, the conclusions support the continued need for strong, targeted financial support mechanisms within the Portuguese higher education system to promote equitable access and success.

The evidence presented in this dissertation suggests that tuition fees alone are not the determining factor in shaping students' financial experiences, access to higher education, or academic success. Their influence is negligible—and often overshadowed—by broader structural and institutional factors. However, the findings also reinforce the importance of maintaining and enhancing financial support mechanisms to ensure that tuition fees do not exacerbate existing inequalities. A comprehensive, equity-focused approach to higher education financing, one that balances institutional sustainability with individual opportunity, is essential to fostering an inclusive and effective system of tertiary education across Europe.

## Appendix

Models with alternative dependent variables.

**Table A1 - Students' Parental Economic Situation (Average Marginal Effects)**

| Variables              | (1)                   | (2)                   | (3)                   | (4)                   | (5)                   |
|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Tuition Fees           | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Female                 |                       | -0.013 ***<br>(0.002) | -0.011 ***<br>(0.003) | -0.010 ***<br>(0.002) | -0.011 ***<br>(0.003) |
| National               |                       | -0.051 ***<br>(0.004) | -0.071 ***<br>(0.004) | -0.070 ***<br>(0.004) | -0.068 ***<br>(0.004) |
| Mother's HE            |                       | -0.095 ***<br>(0.003) | -0.083 ***<br>(0.003) | -0.084 ***<br>(0.003) | -0.084 ***<br>(0.003) |
| Father's HE            |                       | -0.127 ***<br>(0.002) | -0.112 ***<br>(0.003) | -0.113 ***<br>(0.003) | -0.113 ***<br>(0.003) |
| Living without parents |                       | 0.010 ***<br>(0.003)  | 0.012 **<br>(0.005)   | 0.012 **<br>(0.005)   | 0.011 **<br>(0.005)   |
| Total Expenses         |                       |                       | 0.000<br>(0.000)      | 0.000 *<br>(0.000)    | 0.000 **<br>(0.000)   |
| Accommodation          |                       |                       | 0.000 **<br>(0.000)   | 0.000 *<br>(0.000)    | 0.000 *<br>(0.000)    |
| Food                   |                       |                       | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Transportation         |                       |                       | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Total Income           |                       |                       | 0.000 **<br>(0.000)   | 0.000 **<br>(0.000)   | 0.000<br>(0.000)      |
| Family                 |                       |                       | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Self-earned            |                       |                       | -0.000 **<br>(0.000)  | -0.000 *<br>(0.000)   | -0.000<br>(0.000)     |
| State                  |                       |                       | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Public Support         |                       |                       | 0.005<br>(0.004)      | 0.005<br>(0.004)      | 0.006<br>(0.004)      |
| Workers                |                       |                       | 0.013 **<br>(0.006)   | 0.012 **<br>(0.006)   | 0.012 **<br>(0.005)   |
| University Status      |                       |                       |                       | 0.008 **<br>(0.004)   | 0.002<br>(0.004)      |
| Studying Location      |                       |                       |                       | 0.013 **<br>(0.005)   | 0.012 **<br>(0.005)   |
| Number of observations | 43897                 | 43897                 | 43897                 | 43897                 | 43897                 |
| Pseudo R-squared       | 0.02                  | 0.09                  | 0.12                  | 0.12                  | 0.12                  |
| FE Country             | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| FE Field               |                       |                       |                       |                       | Yes                   |
| FE Program             |                       |                       |                       |                       | Yes                   |

Source: Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

**Table A2 - Students' Intention to Enroll into HE (Average Marginal Effects)**

| Variables              | (1)                  | (2)                   | (3)                   | (4)                   | (5)                   |
|------------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Tuition Fees           | 0.000 ***<br>(0.000) | 0.000<br>(0.000)      | 0.000 *<br>(0.000)    | 0.000 **<br>(0.000)   | 0.000 *<br>(0.000)    |
| Female                 |                      | 0.036 ***<br>(0.006)  | 0.034 ***<br>(0.005)  | 0.035 ***<br>(0.005)  | 0.037 ***<br>(0.003)  |
| National               |                      | -0.083 ***<br>(0.009) | -0.067 ***<br>(0.009) | -0.064 ***<br>(0.009) | -0.063 ***<br>(0.008) |
| Mother's HE            |                      | 0.084 ***<br>(0.004)  | 0.074 ***<br>(0.003)  | 0.071 ***<br>(0.003)  | 0.069 ***<br>(0.003)  |
| Father's HE            |                      | 0.080 ***<br>(0.005)  | 0.070 ***<br>(0.005)  | 0.067 ***<br>(0.005)  | 0.065 ***<br>(0.004)  |
| Living without parents |                      | -0.025 ***<br>(0.005) | -0.025 ***<br>(0.007) | -0.025 ***<br>(0.007) | -0.026 ***<br>(0.007) |
| Total Expenses         |                      |                       | -0.000 **<br>(0.000)  | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Accommodation          |                      |                       | 0.000<br>(0.000)      | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Food                   |                      |                       | 0.000<br>(0.000)      | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Transportation         |                      |                       | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Total Income           |                      |                       | -0.000<br>(0.000)     | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Family                 |                      |                       | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Self-earned            |                      |                       | -0.000<br>(0.000)     | 0.000<br>(0.000)      | -0.000<br>(0.000)     |
| State                  |                      |                       | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Public Support         |                      |                       | 0.015 ***<br>(0.005)  | 0.016 ***<br>(0.005)  | 0.015 ***<br>(0.005)  |
| Workers                |                      |                       | -0.002<br>(0.002)     | -0.004 *<br>(0.002)   | -0.003<br>(0.002)     |
| University Status      |                      |                       |                       | 0.040 ***<br>(0.009)  | 0.029 ***<br>(0.010)  |
| Studying Location      |                      |                       |                       | 0.023 ***<br>(0.005)  | 0.024 ***<br>(0.004)  |
| Number of observations | 43897                | 43897                 | 43897                 | 43897                 | 43897                 |
| Pseudo R-squared       | 0.05                 | 0.13                  | 0.15                  | 0.15                  | 0.16                  |
| FE Country             |                      | Yes                   | Yes                   | Yes                   | Yes                   |
| FE Field               |                      |                       |                       |                       | Yes                   |
| FE Program             |                      |                       |                       |                       | Yes                   |

Source: Author's calculations (using Stata 18).

\*\*\* p<.01, \*\* p<.05, \* p<.1

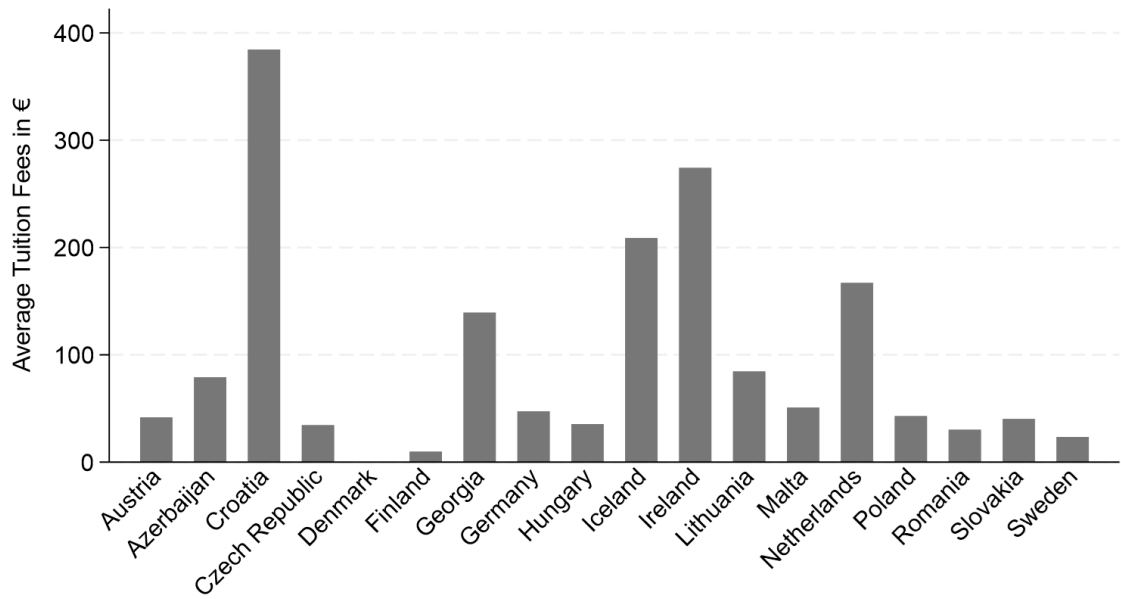
**Table A3 - Students' Intention to abandon completely HE (Average Marginal Effects)**

| Variables              | (1)               | (2)                  | (3)                   | (4)                   | (5)                   |
|------------------------|-------------------|----------------------|-----------------------|-----------------------|-----------------------|
| Tuition Fees           | -0.000<br>(0.000) | -0.000<br>(0.000)    | 0.000<br>(0.000)      | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Female                 |                   | 0.008 ***<br>(0.002) | 0.008 ***<br>(0.002)  | 0.007 ***<br>(0.002)  | 0.003 **<br>(0.001)   |
| National               |                   | 0.012 ***<br>(0.001) | 0.013 ***<br>(0.001)  | 0.013 ***<br>(0.001)  | 0.013 ***<br>(0.002)  |
| Mother's HE            |                   | 0.006 *<br>(0.003)   | 0.004<br>(0.003)      | 0.004<br>(0.003)      | 0.004<br>(0.003)      |
| Father's HE            |                   | 0.010 ***<br>(0.002) | 0.008 ***<br>(0.002)  | 0.009 ***<br>(0.002)  | 0.009 ***<br>(0.002)  |
| Living without parents |                   | 0.003 **<br>(0.001)  | 0.003<br>(0.002)      | 0.002<br>(0.002)      | 0.002<br>(0.002)      |
| Total Expenses         |                   |                      | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| Accommodation          |                   |                      | -0.000 **<br>(0.000)  | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Food                   |                   |                      | 0.000<br>(0.000)      | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Transportation         |                   |                      | 0.000<br>(0.000)      | 0.000<br>(0.000)      | 0.000<br>(0.000)      |
| Total Income           |                   |                      | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Family                 |                   |                      | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  | 0.000 ***<br>(0.000)  |
| Self-earned            |                   |                      | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) | -0.000 ***<br>(0.000) |
| State                  |                   |                      | -0.000<br>(0.000)     | -0.000<br>(0.000)     | -0.000<br>(0.000)     |
| Public Support         |                   |                      | 0.012 **<br>(0.005)   | 0.012 ***<br>(0.005)  | 0.013 ***<br>(0.004)  |
| Workers                |                   |                      | -0.001<br>(0.003)     | 0.001<br>(0.003)      | 0.000<br>(0.003)      |
| University Status      |                   |                      |                       | 0.001<br>(0.003)      | -0.001<br>(0.001)     |
| Studying Location      |                   |                      |                       | 0.001<br>(0.001)      | 0.000<br>(0.001)      |
| Student Status         |                   |                      |                       | -0.019 ***<br>(0.007) | -0.018 **<br>(0.007)  |
| Studying Hours         |                   |                      |                       | 0.001 ***<br>(0.000)  | 0.001 ***<br>(0.000)  |
| Number of observations | 43832             | 43832                | 43832                 | 43832                 | 43832                 |
| Pseudo R-squared       | 0.01              | 0.03                 | 0.04                  | 0.04                  | 0.05                  |
| FE Country             | Yes               | Yes                  | Yes                   | Yes                   | Yes                   |
| FE Field               |                   |                      |                       |                       | Yes                   |
| FE Program             |                   |                      |                       |                       | Yes                   |

Source: Author's calculations (using Stata 18).

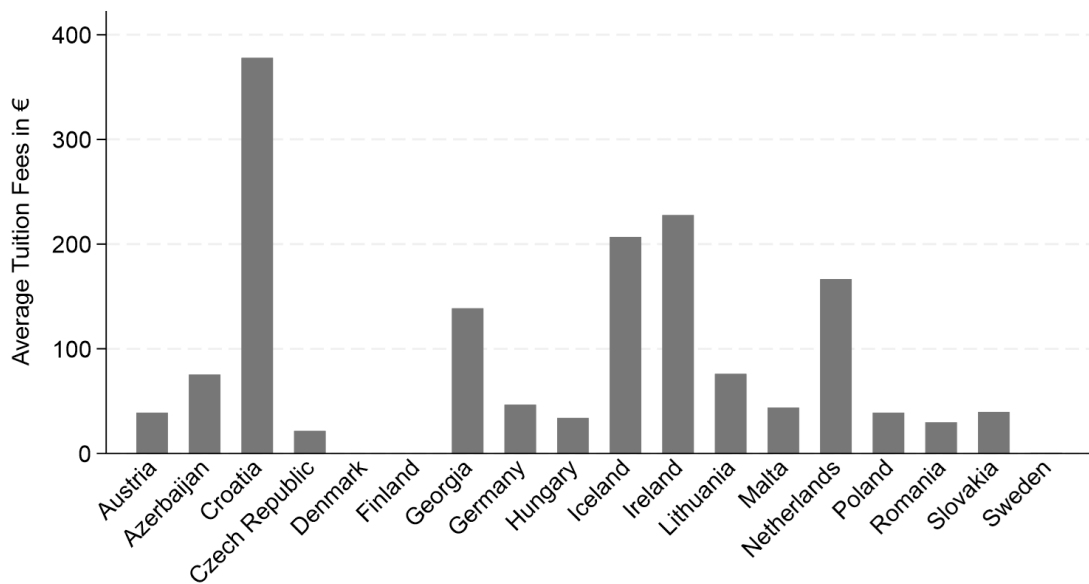
\*\*\* p<.01, \*\* p<.05, \* p<.1

**Figure A1 - Graph of average tuition fees paid monthly in each country**



*Source:* Author's elaboration.

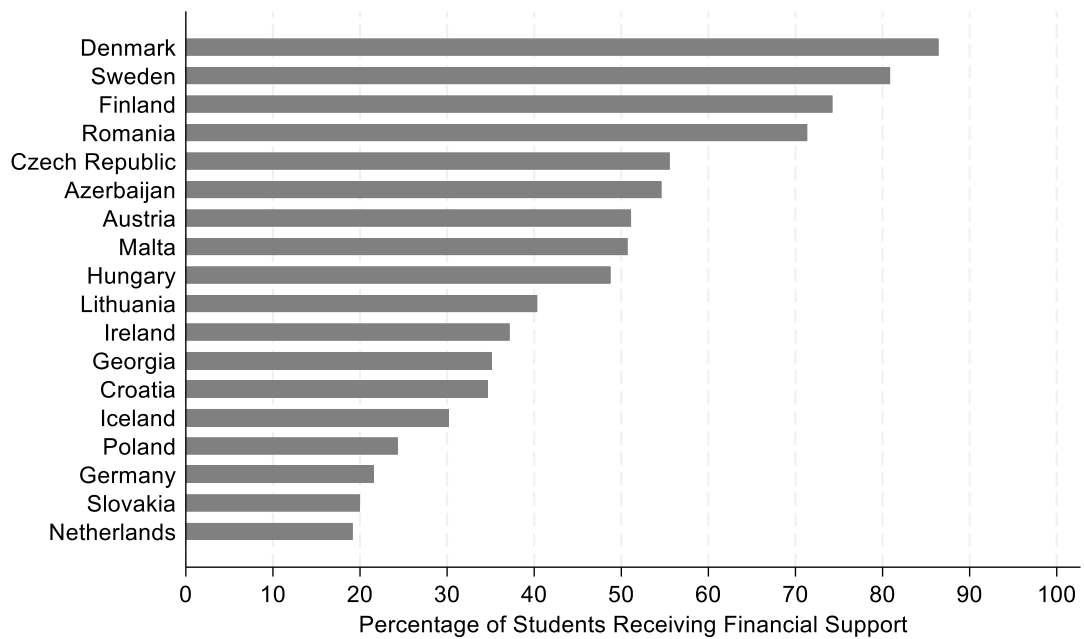
**Figure A2 - Graph of average tuition fees paid monthly by national students by country**



*Source:* Author's elaboration.

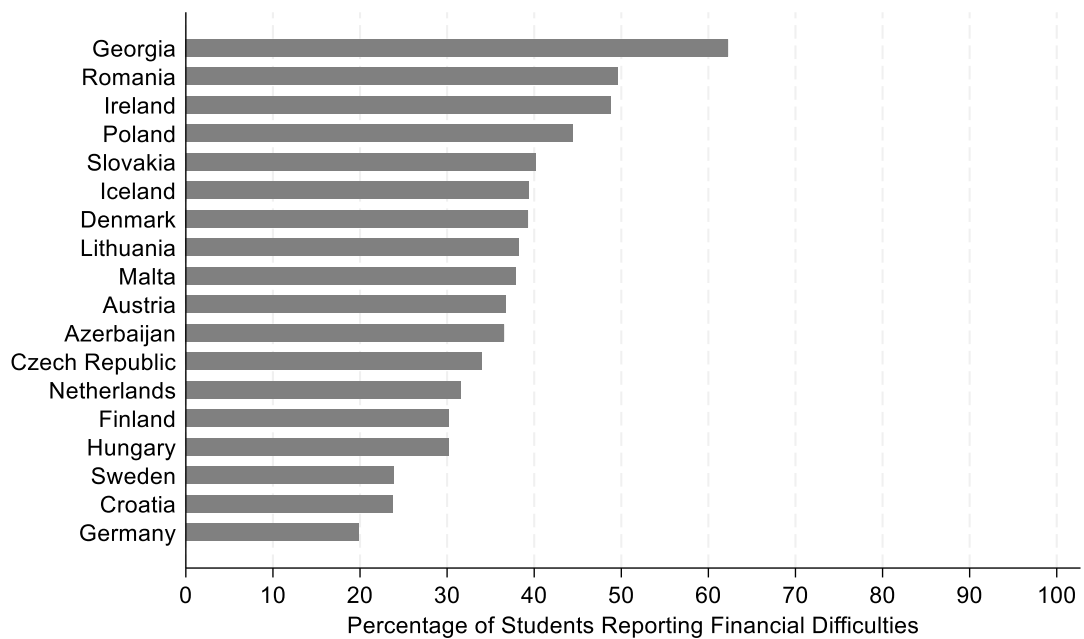


**Figure A3 - Percentage of students receiving public financial support by country**



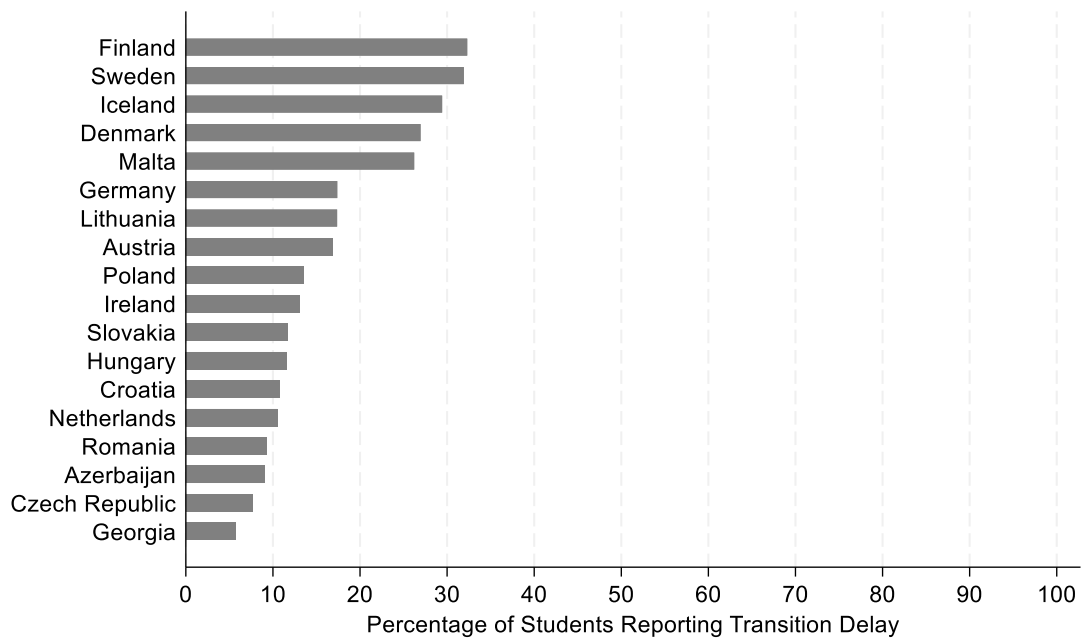
*Source:* Author's elaboration.

**Figure A4 - Percentage of students reporting financial difficulties by country**



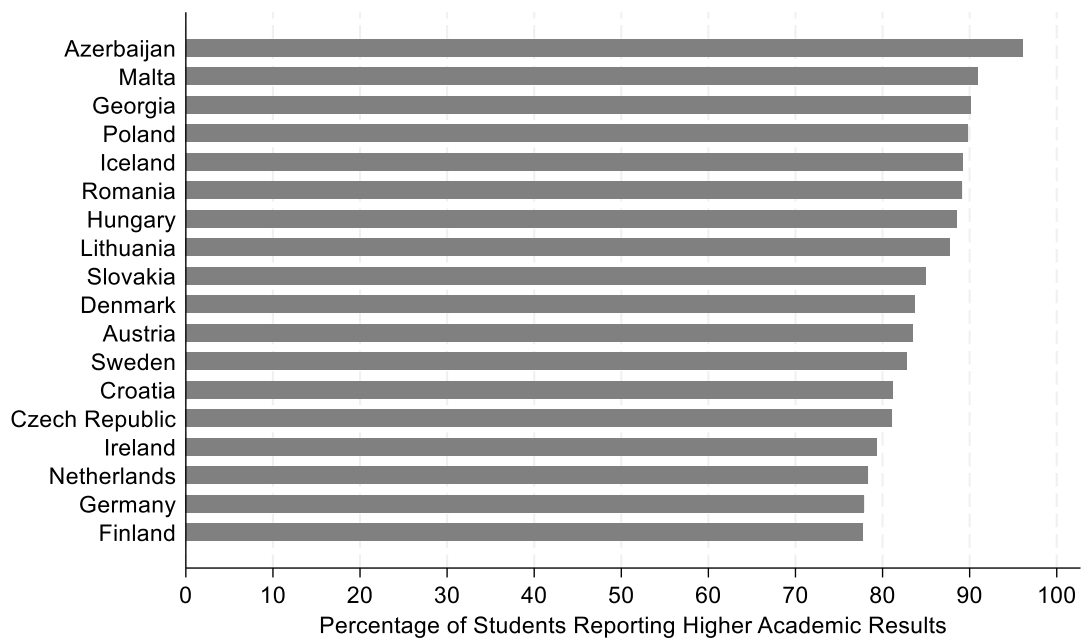
*Source:* Author's elaboration.

**Figure A5 - Percentage of students reporting transition delay into HE by country**



*Source:* Author's elaboration.

**Figure A6 - Percentage of students reporting average/higher attainment by country**



*Source:* Author's elaboration.

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