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How Gender, Culture, and Economy Influence Field of Study Preferences in Higher Education: Exploring Gender Gaps in STEM, AHSS, and Medicine among International Students

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Abstract: International female and male students' segregation per academic fields of study designates an important challenge for educational equity, diversity, and gender equality in tertiary education institutions worldwide. This study probes the determinants of study field choice among 984 students from 57 countries who enrolled at the University of Oradea, Romania, during 2022–2023. By incorporating gender approaches and concepts within broader economic and cultural theories, we utilized the bivariate analysis and multinominal regression models to scrutinize how students' preferences for STEM (science, technology, engineering, and mathematics), AHSS (arts, humanities, and social sciences), or medicine are influenced by their gender, and the more general cultural and economic attributes of their home country. Our findings enrich the knowledge and understanding of gendered patterns of academic study field choice, providing a cross-cultural and integrative viewpoint that enables us to set forth recommendations to bridge higher education gender gaps.

Keywords: gender equality; gender gap; higher education; field of study; international students; STEM; AHSS; medicine; Romania

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1. Introduction

Gender differences concerning international students' academic choices are a focal interest for researchers, educators, and decision-makers. The students' choice to follow a certain study field strongly influences both their educational and professional outcomes as well as the human capital distribution and skills in society [1–5]. Nevertheless, the study field choice is not student-gender neutral as men and women tend to significantly differ in terms of their preferences and enrolments per different academic specializations [6–9]. More precisely, men are more prone to choose science, technology, engineering, and mathematics, whereas women show a higher probability of choosing arts, humanities, and social sciences, or medicine [10–17]. Although women are a majority among the high-education enrolled students at a global level, field study segregation remains a critical factor that accounts for the prevalence of wage inequalities among men and women in the labor market [18–24].

The specialized literature reveals more explanations for gender imparity in different fields and academic disciplines [23,25,26], but empirical findings undermine their explanatory power [27]. Some of these explanations focus on microlevel factor effects, such as cognitive skills specific to each gender, perceived self-efficacy in various study fields, gender role socialization, and gender beliefs and stereotypes [13,28–30]; for a review, see [31]. On one hand, these factors might only account for a small part of the study

field choice variation, and on the other hand, they have inconsistent effects in different countries and contexts [15,32,33]. Other explanations underline macrolevel factors such as educational system structures, job market opportunities, and the incentives for different study fields, as well as the cultural and institutional contexts which shape gender norms and expectations [8,13,34,35]. Rather often, these factors have heterogeneous effects on the study field choice or interact with the microlevel factors in multiple and contradictory ways [16,34,35].

In addition, the academic literature mainly analyzed domestic college students' gendered preferences for fields of study [10,11]. Nevertheless, research on international students might deliver valuable opportunities for understanding how gender and broader contextual factors impact the academic choices of persons educated in different socioeconomic and cultural milieux from their country of origin. Moreover, the study of international students is essential as they represent a heterogeneous growing population in global higher education [36], and their choices may be impacted by different factors than the ones usually affecting domestic students [37]. International students also face specific issues and opportunities regarding their professional and academic routes, such as the adjustments to a new culture and educational system, as well as the chance of developing intercultural and linguistic skills that can influence their contribution to the global society and economy [38]. Henceforth, studying international students' gendered field of study choice can provide valuable information for addressing the gender gap in higher education and the inequalities in the global labor market [39].

In the current study, we adopt an integrative approach that combines micro-individual and contextual factors to analyze the academic choice of the international students who study in Romania at the University of Oradea. Romania provides a fascinating milieu to examine higher education gender disparities as it faced noteworthy social and economic changes from the fall of communism in 1989, which affected both the educational system and the labor market [40–42]. Furthermore, Romania has the highest ratio of female to male graduates (0.80) in science, technology, engineering, and mathematics (STEM) among the European Union countries (EU average is only 0.52) [43], a fact that questions some of the common assumptions related to higher education gender segregation. To examine the gender patterns in different study fields, we use a dataset that includes 984 international students enrolled within the University of Oradea in the academic year 2022–2023. These students come from different cultural and socioeconomic settings, namely 57 countries of different world regions.

The purpose of this study is to examine the extent to which international students' gender, in combination with their home country's development level and gender equality index, impacts their study field choice at the University of Oradea, Romania. More precisely, we aim to explore how these individual and contextual factors match international students' preference for one of the three primary study fields: science, technology, engineering, and mathematics (STEM); arts, humanities, and social sciences (AHSS), and medicine. Our general argument is that international students' academic choice patterns are context-dependent, reflecting the interaction between gender, culture, and economic development in different countries. In the following sections of this study, we are operationalizing the main argument into more specific hypotheses, which we are evaluating using statistical analysis on a dataset concerning international students provided by the University of Oradea and completed with contextual data concerning the students' countries of origin.

Besides the introduction, we organized this paper into five sections. First, we critically assess the main cultural and economic perspectives, focusing on factors that affect the study field choice, and then we formulate the relevant hypotheses of each theoretical approach. Second, we discuss the used data and methods for empirically testing our hypotheses. Third, we show the results of the bivariate and multinominal regression results. Fourth, we discuss and interpret our study results, considering the theoretical expectations highlighted in the section concerning the literature review. In the final section,

we summarize this research's main contributions and implications and suggest specific ways to develop it further.

2. Literature Review and Hypotheses

Despite the increasing number of women who pursue higher education, gender inequality in academia remains an omnipresent and persistent phenomenon [26,31,44–51]. The decision process of choosing a field of study is complex and influenced by many circumstances. Understanding the factors that impact international students' field of study choice is crucial for academic institutions and decision-makers to shape educational policies and support systems more effectively. The theoretical framework that lays the ground of this research integrates micro and macro perspectives to explain the academic gender patterns, more precisely, the field of study choice.

Gender theories refer to diverse approaches that analyze how gender is built, performed, and replicated in different social contexts. Generally, constructivist perspectives oppose the essentialist opinion according to which gender is a natural attribute, innate and fixed, derived from the biological sex. On the other hand, they claim that gender is a fluid and dynamic category shaped by social interactions, norms, and expectations [52,53]. The followers of these perspectives also examine how gender intersects with other social categories, such as class, race, ethnicity, sexuality, and nationality, to generate multiple and diverse shapes of identity and inequality [54,55]. Gender theories are relevant for understanding the field of study choice as they focus on how individuals attach meanings and values to different academic disciplines. According to these theories, the expectations and pressures from the relevant ones, such as parents, professors, and role models, influence students' preferences and decisions on college paths [13,56–58]. For instance, Eagly and Wood [59] claim that individuals learn gender roles through socialization. Subsequently, these internalized gender roles impact the educational and career paths that students decide to follow. For instance, female students may be encouraged to pursue careers in fields perceived as traditionally feminine, such as education or medical assistance.

On the other hand, male students may be encouraged to pursue careers in disciplines conventionally considered masculine, such as engineering and informatics. The stereotype threat theory can also explain the gender gap in the academic field choice. Steele and Aronson [60] show that people can have worse results at different tasks when they are aware of the negative stereotypes concerning their group. If women are aware of the stereotype that they are not good at mathematics or science, this can undermine their potential and performance in fields such as STEM. Based on these theories, we formulate two hypotheses connecting international students' gender to their academic study field:

H1A. *Female international students are more likely to choose AHSS over STEM as their field of study than male international students.*

H1B. *Female international students are more likely to choose medicine over STEM as their field of study than male international students.*

Dominant gender norms and expectations in international students' home countries can also impact their preference for particular study fields. Socialization theories underline the role of culture in shaping individuals' values, beliefs, attitudes, and behaviors. In this context, culture refers to the shared symbols, meanings, norms, and practices that constitute the collective identity and vision of the world of a particular group or society. Cultural perspectives assume that individuals' social background marks their mindset, affecting their educational choices [61,62]. Thus, cultural approaches are relevant for understanding the study field choice. They suggest that students' preferences and decisions are influenced by the prevailing values and norms of their country of origin, as well as by the cultural diversity and integration in the host country [34,35,63]. According to this approach, gender roles and the associated stereotypes are not natural or inevitable. Instead, they are learned

and consolidated through social interactions within diverse institutions and arenas such as family, media, the education system, and the labor market.

In addition, gender-related social norms and expectations are not fixed but dynamic and evolving phenomena. For example, Inglehart and Norris [64] claim that the shift from industrialized societies to postindustrialized ones is culturally associated with the evolution from materialist to postmaterialist values such as self-expression, autonomy, and equality. These changes further led to significant gains regarding gender equality in the public and workplace spheres [64]. Thus, according to modernization theories, higher gender equality reflects a higher level of postmaterialist values in a society, which can stimulate more diverse and flexible study field choices both for men and women. On the one hand, the socioeconomic and cultural changes substantiated by these theories have provided more opportunities for individuals' educational choices.

On the other hand, the educational path of people who live in countries with lower gender equality remains relatively constrained by gender stereotypes and expectations that limit individual options. Nevertheless, gendered patterns concerning the fields of study in higher education endure even in advanced postindustrial societies. For example, in a comparative study of 44 countries, Charles and Bradley [63] show that segregation by gender per study field is not an outcome of traditionalism or backwardness but rather a product of the modernization of society, which favors gender identities which in their turn lead to gendered academic choice patterns. The authors find that gender segregation by fields of study is higher in societies with more equalitarian contexts concerning gender in which the gender-related essentialist ideology and self-expression value systems create opportunities and incentives for the "gendered selves" expression [63]. Thus, based on this theoretical framework, we can argue that international students from more gender-equalitarian societies have a higher propensity to choose AHSS or medicine over STEM, as they have more freedom and diversity in their educational choices. Furthermore, they are motivated by their interests and hobbies rather than social norms and pressures. Based on the cultural approaches highlighted above, we formulate two hypotheses concerning the relationship between the gender equality levels in international students' country of origin and their field of study preferences:

H2A. *International students coming from countries with higher levels of gender equality are more likely to choose AHSS over STEM as their field of study compared with international students coming from countries with lower gender equality.*

H2B. *International students coming from countries with higher levels of gender equality are more likely to choose medicine over STEM as their field of study compared with international students coming from countries with lower gender equality.*

International students can choose disciplines relevant to their home country's economic development priorities, preparing for the challenges and opportunities from their region of origin. The human capital theory is an economic perspective of education as an investment. Thus, students perceive the skills and knowledge achieved in college as a means to improve productivity and gains in the labor market. The human capital theory assumes that individuals are rational actors who make educational choices based on different study fields' expected costs and benefits [65,66]. Thus, examining the economic development levels of international students' countries of origin may be relevant for understanding their field of study choice. This approach assumes that the individuals' preferences and decisions are influenced by the opportunities and rewards in the labor market associated with different study fields as well as the assumed risks and uncertainties concerning employment in a specific job [45,67,68]. Therefore, these theories would predict that students from developing economies are more likely to study disciplines that grant a higher income and status in their home country or abroad [67], which may favor medicine over STEM. Moreover, lower economic development levels in students' home countries

could also limit the availability and quality of education and career-related opportunities both for men and women. Thus, weaker outcomes of STEM education and skills regarding income, employment, and social status can discourage students from developing countries from choosing STEM over medicine or AHSS.

On the other hand, international students from economies in transition may be less tempted to choose disciplines requiring higher tuition fees or a longer period of academic education [68]. Thus, they may be less likely to choose medicine over STEM than students from developed economies. More than that, there can be a lower demand and supply for medical skills in economies in transition. The public health sector in these economies may be relatively underdeveloped, underfunded, and understaffed, resulting in low quality and accessibility of health services, low salaries and incentives for those employed in healthcare, and high morbidity and mortality rates [69–71]. These factors may spawn lower expected results for education in medicine. Therefore, students from economies in transition may be less likely to choose medicine as a study field as they can perceive it as less valuable or full of satisfaction in terms of human capital accumulation and the outcomes in the labor market.

Furthermore, international students from countries with higher development levels may be more likely to choose AHSS over STEM than those from countries with transition economies. This hypothesis matches Bell's [72] postindustrialization theory, which claims that socioeconomic development favors the passage from industrialist to postindustrialist societies characterized by the growth of the services, information, and knowledge sectors. According to this theory, a higher development level implies a greater demand for more relevant and applicable skills in the AHSS fields, such as creativity, critical thinking, and communication. Based on the human capital theories highlighted above, we formulate four hypotheses linking international students' choice for a field of study and the economic development levels of their home country:

H3A. *International students from developing economies are more likely to choose AHSS over STEM as their field of study than international students from developed economies.*

H3B. *International students from developing economies are more likely to choose medicine over STEM as their field of study than international students from developed economies.*

H3C. *International students from economies in transition are less likely to choose AHSS over STEM as their field of study than international students from developed economies.*

H3D. *International students from economies in transition are less likely to choose medicine over STEM as their field of study than international students from developed economies.*

We empirically assessed these hypotheses using a multinomial logistic regression model having the study field as a dependent variable and the international students' gender, the gender equality index, and the economic development levels of their home country as independent variables. The following section describes the empirical data sources and the analysis methods used.

3. Data and Methods

3.1. Data Sources

The data for this study come from two sources. First, the University of Oradea administrative service has provided us with a database of the 984 individual international students enrolled in the academic year 2022–2023 [73]. Second, we have completed the dataset with country-level information concerning gender equality and economic development in the international students' home country (see Supplementary Materials). The dataset contains individual-level variables about gender, nationality, the field of study, study level (BSc/BA, MSc/MA, or Ph.D.), and the study year of the international students from

57 countries. We have compiled the country-level data from the online platforms of the Global Gender Gap Report 2022, elaborated by the World Economic Forum [74] and World Economic Situation and Prospects 2022–Statistical Annex Report by the United Nations–The Social and Economic Affairs Department [75]. The Gender Gap Index, renamed in our analysis as the Gender Equality Index, provides a composite country-level measure of the gender-based parity levels in four key areas: economic participation and opportunities, educational attainment, health and survival, and political empowerment. Regarding the economic-related data gathering, we used the UN report concerning the World Economic Situation and Prospects from 2022, which ranks the countries' development levels into three categories: developing economies, economies in transition, and developed economies.

3.2. Variables

The dependent variable in our statistical analysis is the international students' study field, coded as a nominal variable with three categories: 1 = STEM (science, technology, engineering, and mathematics), 2 = AHSS (arts, humanities, and social sciences), and 3 = medicine. The independent variables were gender, the gender equality index, and the country's development level. Data on students' gender was collected by the University of Oradea's Office for Budget and Student Records in a binary format, and thus, we recoded it into a variable with two categories: women (0) and men (1). The gender equality index is a variable that initially varied from 0 (no equality) to 1 (full equality). For analytical purposes, we standardized this variable (mean = 0, standard deviation = 1, Min = −2.56, Max = 1.50), the higher values showing more gender equality in the home country. The home country's development level represents a nominal variable with three categories: 1 = developing economies, 2 = economies in transition, and 3 = developed economies.

3.3. Data Analysis

The data analysis was carried out in two stages. First, we use descriptive statistics to summarize the sample characteristics and contingency tables to examine the association between variables. Second, we run a multinomial logistic regression model to assess the hypotheses and estimate the specific effects of students' gender, home country development level, and gender equality index on their field of study choice, controlling the effects of all other variables from the statistical model. We set the reference category for the dependent variable as STEM, which means that the B coefficients represent the log odds of choosing AHSS or medicine over STEM for a one-unit increase in the independent variable, maintaining the other variables constant. The exponential coefficients Exp(B) represent the odds ratio, namely how much the odds of choosing AHSS or medicine over STEM have changed for a one-unit increase of the independent variable, maintaining the other variables constant. The statistical significance level is at 0.05. We carried out the statistical analysis using SPSS version 20. Thus, since our outcome variable, namely, field of study, has three categories (STEM, AHSS, and medicine) the mathematical model applied in this article is the multinomial logistic regression. We set STEM as the reference category, and the mathematical formulas used to predict students' field of study are the following:

1. For AHSS versus STEM:

$$\log\left(\frac{P(\text{Field of Study}_i=\text{AHSS})}{P(\text{Field of Study}_i=\text{STEM})}\right) = \beta_0 + \beta_1 \times \text{Gender equality index}_i + \beta_2 \times \text{Gender}_i + \beta_3 \times \text{Developing economies}_i + \beta_4 \times \text{Economies in transition}_i$$

2. For Medicine versus STEM:

$$\log\left(\frac{P(\text{Field of Study}_i=\text{Medicine})}{P(\text{Field of Study}_i=\text{STEM})}\right) = \beta_0 + \beta_1 \times \text{Gender equality index}_i + \beta_2 \times \text{Gender}_i + \beta_3 \times \text{Developing economies}_i + \beta_4 \times \text{Economies in transition}_i$$

where:

- β_0 is the intercept.

- β_1 is the coefficient of the gender equality index.
- β_2 is the coefficient of gender.
- β_3 is the coefficient of developing economies.
- β_4 is the coefficient of economies in transition.
- i is the index for the *i*th observation in our dataset.
- The variables Gender, Developing economies, and Economies in transition, are dummy variables, which take the value 1 if the condition is true and 0 otherwise, for the *i*th observation. For example, $gender_i$ is 1 if the *i*th student is female and 0 if the *i*th student is male.

4. Results

4.1. Descriptive Statistics

Table 1 shows the descriptive statistics of the variables included in this study. We used a dataset comprising 984 international students from 57 countries, of which 530 (53.9%) are men and 454 (46.1%) are women. The most frequent field study is medicine (68.1%), followed by AHSS (24.2%) and STEM (7.7%). The country of origin gender equality index is a standardized variable (mean = 0, standard deviation = 1, Min = −2.56, Max = 1.50), with higher values indicating more gender equality. This variable was recodified from the gender gap original index supplied by WEF (2022). The most frequent country of origin development level was economies in transition (40.4%), followed by developing economies (36%) and developed economies (23.6%).

Table 1. Descriptive statistics.

Variables	N	%
Dependent variable–Field of Study		
STEM	76	7.7
AHSS	238	24.2
Medicine	670	68.1
Independent variables		
Gender		
Female	452	46.1
Male	530	53.9
Country of origin development level		
Developing economy	354	36.0
Economy in transition	398	40.4
Developed economy	232	23.6
Country of origin gender equality index (standardized)	N = 920 *, Mean = 0, SD = 1, Min = −2.56, Max = 1.50	

Note: * 64 cases are missing for this variable as there were no data available for the gender equality index for students coming from Iraq, Palestine, Russia, Syria, Sudan, and Yemen. Source: Authors' elaboration.

Table 2 shows the cross-tabulation of the students' gender and their study field, using a chi-square test of independence to analyze the data for the 984 students. The results show that there is a significant statistical association between students' field of study and their gender ($\chi^2(2) = 48.308$, $p < 0.001$, Cramer's V = 0.222). The percentage of female students studying STEM fields (4.4%) is significantly lower than that of the male students enrolled in STEM (10.6%). On the other hand, the proportion of female students pursuing degrees in AHSS (33.7%) is significantly higher than that of the male students in AHSS (16%). The female students' ratio in medicine (61.9%) is lower than that of the male students (73.4%), but in relative terms, the difference is not as big as in the case of other fields. These findings suggest significant gender gaps in students' field of study choice. More precisely, female students are more likely to choose AHSS and less likely to prefer STEM versus male students.

Table 2. Association between students' gender and field of study.

Field of Study	Gender		Total
	Female	Male	
STEM	20 (4.4%)	56 (10.6%)	76 (7.7%)
AHSS	153 (33.7%)	85 (16.0%)	238 (24.2%
Medicine	281 (61.9%)	389 (73.4%)	670 (68.1%)
Total	454 (100%)	530 (100%)	984 (100%)

Notes: ($\chi^2(2) = 48.308$, $p < 0.001$, Cramer's V = 0.222, N = 984). STEM = science, technology, engineering, and mathematics; AHSS = arts, humanities, and social sciences. Source: Authors' elaboration.

Table 3 underlines that there is a statistically significant relationship between students' field of study and their country of origin development level ($\chi^2(4) = 432.402$, $p < 0.001$, Cramer's V = 0.469). Most students from developing (94.4%) and developed (92.2%) economies have chosen medicine as their field of study, while only 30.7% of the students from economies in transition have chosen it. On the other hand, more than half of the students from the economies in transition (53.5%) have chosen AHSS as their field of study compared to 3.7% of the students from developing economies and 5.2% from developed economies. STEM is the least popular field of study among all students but has a significantly higher ratio among students from economies in transition (15.8%) than among students from developing (2%) and developed (2.6%) economies. These findings show that students' preferences for a field of study vary according to their home country's economic development levels.

Table 3. Students' field of study based on the level of development of their country of origin.

Field of Study	Country of Origin Development Level			Total
	Developing Economies	Economies in Transition	Developed Economies	
STEM	7 (2.0%)	63 (15.8%)	6 (2.6%)	76 (7.7%)
AHSS	13 (3.7%)	213 (53.5%)	12 (5.2%)	238 (24.2%)
Medicine	334 (94.4%)	122 (30.7%)	214 (92.2%)	670 (68.1%)
TOTAL	354 (100%)	398 (100%)	232 (100%)	984 (100%)

Notes: ($\chi^2(2) = 432.402$, $p < 0.001$, Cramer's V = 0.469, N = 984). STEM = science, technology, engineering, and mathematics; AHSS = arts, humanities, and social sciences. Source: Authors' elaboration.

4.2. Multinomial Logistic Regression

A multinomial regression model was used to examine the effects of the student gender, the country of origin development level, and the gender equality index on the choice of the field of study. The dependent variable is international students' choice for a field of study, which had three categories: STEM, AHSS, and medicine. The reference category is STEM. The independent variables are students' gender (0 = female, 1 = male), country of origin development level (1 = developing economies, 2 = economies in transition, 3 = developed economies), and gender equality index.

We have evaluated the model fit using AIC, BIC, −2 log-likelihood, and chi-square statistics. The final model has a significantly better match to data than the intercept-only model, as the chi-square model shows ($\chi^2(8) = 481.927$, $p < 0.001$). The pseudo-R-squared values also suggest that the model explains a moderate to a relatively large degree of the variance of the dependent variable (Cox and Snell = 0.408, Nagelkerke = 0.504, McFadden = 0.317). The classification table highlights that per whole, the model predicts correctly 75.9% of the cases. The model has a high accuracy for predicting AHSS and medicine but a low accuracy for predicting STEM.

The parameter estimates presented in Table 4 show the effects of each independent variable on the log odds of choosing AHSS or medicine over STEM, controlling the effects of other variables included in the model. The results indicate that the gender equality index has a positive and significant effect on the odds of choosing medicine over STEM (B = 1.027,

SE = 0.375, $p = 0.006$) but not on the likelihood of choosing AHSS over STEM (B = 0.528, SE = 0.418, $p = 0.207$). In other words, higher gender equality levels in students' countries of origin increase their probability of choosing medicine over STEM. However, it does not significantly influence their likelihood of choosing AHSS over STEM.

Table 4. The multinomial regression model predicting students' field of study.

Field of Study [a]	Predictors	B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
AHSS versus STEM	Intercept	0.172	0.517	0.110	1	0.740			
	Gender equality index	0.528	0.418	1.594	1	0.207	1.695	0.747	3.844
	Gender (female)	1.687	0.303	31.068	1	0.000	5.406	2.986	9.784
	Gender (male)	0 [b]			0				
	Developing economies	0.989	0.951	1.083	1	0.298	2.690	0.417	17.341
	Economies in transition	−0.010	0.567	0.000	1	0.986	0.990	0.326	3.011
	Developed economies	0 [b]			0				
Medicine versus STEM	Intercept	2.754	0.426	41.802	1	0.000			
	Gender equality index	1.027	0.375	7.505	1	0.006	2.792	1.339	5.822
	Gender (female)	1.795	0.316	32.216	1	0.000	6.021	3.239	11.191
	Gender (male)	0 [b]			0				
	Developing economies	2.135	0.807	6.999	1	0.008	8.455	1.739	41.111
	Economies in transition	−3.478	0.504	47.647	1	0.000	0.031	0.011	0.083
	Developed economies	0 [b]			0				

Note: [a] The reference category is STEM. [b] This parameter is set to zero because it is redundant. Source: Authors' elaboration.

On the other hand, students' gender has a positive and significant effect on the odds of choosing AHSS over STEM (B = 1.687, SE = 0.303, $p < 0.001$) and of choosing medicine over STEM (B = 1.795, SE = 0.316, $p < 0.001$). In other words, female students are over five times more likely to choose AHSS over STEM than male students, keeping all other variables constant (Exp(B) = 5.406). Similarly, female students are over six times more likely to choose medicine over STEM than male students (Exp(B) = 6.021).

The economic situation of the country of origin has mixed effects on the odds of choosing AHSS or medicine over STEM. Compared to the students coming from developed economies, the ones from developing countries have higher odds of choosing medicine over STEM (B = 2.135, SE = 0.807, $p = 0.008$) but not a significantly different probability of choosing AHSS over STEM (B = 0.989, SE = 0.951, $p = 0.298$). On the other hand, students from transition economies are less likely to choose medicine over STEM (B = −3.478, SE = 0.504, $p < 0.001$). However, they do not have a significantly different probability of choosing AHSS over STEM (B = −0.010, SE = 0.567, $p = 0.986$). In other words, students from developing economies are 8.455 times more likely to choose medicine over STEM as a field of study than students from developed countries (Exp(B) = 8.455). On the other hand, students from economies in transition are 32 times less likely to choose medicine over STEM than their counterparts from developed economies. These findings highlight the powerful effect of students' home country's economic development level on their choice between studying rather than STEM.

5. Discussion

The goal of this research paper was to examine the extent to which gender, country of origin development level, and gender equality affect the field of study choice in the case of the international students enrolled at the University of Oradea, Romania. More precisely, we explored how these micro and macro level factors predict international students' preference for one of the three major fields of study: science, technology, engineering, and mathematics (STEM); arts, humanities, and social sciences (AHSS); and medicine. The results support our argument that international students' academic choices are context-dependent, reflecting the complex interplay between gender, culture, and economic development. In

the literature review section, we have operationalized this wide-ranging expectation into eight more specific hypotheses. We then evaluated these hypotheses with a multinomial regression model using the international students' dataset from the University of Oradea, complemented with contextual data regarding students' country of origin. As shown in Table 5, the results of our statistical analyses have confirmed five of the eight hypotheses, indicating the fact that gender, the country-of-origin development level, and gender equality index generally relate to the field of study choice in the case of the international students enrolled at the University of Oradea, Romania. Nevertheless, the statistical significance, the effect of size, and the direction of these relationships varied according to the level and category of each independent variable.

Table 5. Summary of hypotheses and results of statistical analyses.

Hypothesis	Hypothesis Status
H1A: Female international students are more likely to choose AHSS over STEM as their field of study than male international students.	Supported
H1B: Female international students are more likely to choose medicine over STEM as their field of study than male international students.	Supported
H2A: International students from countries with higher levels of gender equality are more likely to choose AHSS over STEM as their field of study than international students from countries with lower gender equality.	Not supported
H2B: International students from countries with higher levels of gender equality are more likely to choose Medicine over STEM as their field of study than international students from countries with lower gender equality.	Supported
H3A: International students from developing economies are more likely to choose AHSS over STEM as their field of study than international students from developed economies.	Not supported
H3B: International students from developing economies are more likely to choose medicine over STEM as their field of study than international students from developed economies.	Supported
H3C: International students from economies in transition are less likely to choose AHSS over STEM as their field of study than international students from developed economies.	Not supported
H3D: International students from economies in transition are less likely to choose medicine over STEM as their field of study than international students from developed economies.	Supported

Source: Authors' elaboration.

Our results showed that gender is a significant predictor of the field of study choice among international students. In support of hypotheses H1A and H1B, we found that female students are likelier to choose AHSS or medicine over STEM as fields of study than male students. These findings suggest that gender stereotypes and expectations play an enduring role in shaping students' options and decisions concerning their academic path. As we highlight in Figure 1, medicine is the preferred field of study for international female and male students. However, female students are relatively more likely to pursue fields perceived as more socially oriented, such as AHSS. In contrast, male students tend to be relatively more attracted by fields considered more technically oriented, such as STEM. These findings align with previous studies that found similar gender segregation patterns across fields of study among domestic students [6,10,13].

Further, our findings show that the gender equality index is a significant predictor, but only for choosing specific fields of study among international students. Supporting our hypothesis H2B, we found that international students from countries with higher gender equality levels are more likely to choose medicine as their study field over STEM than those from countries with lower gender equality levels. However, we did not find substantial

support for hypothesis H2A since international students from countries with higher gender equality levels were not significantly more likely to choose AHSS over STEM as a study field than international students from countries with lower gender equality. These mixed findings suggest that fields of study are evaluated differently in various cultural contexts. For example, our findings suggest that students from countries with higher gender equality might perceive medicine as a more valuable and significant study field than science and engineering than those from countries with lower gender equality. However, international students from countries with gender equalitarian contexts do not seem to significantly assign more value to studying arts, humanities, and social sciences over science and engineering compared to students from countries with less gender equality.

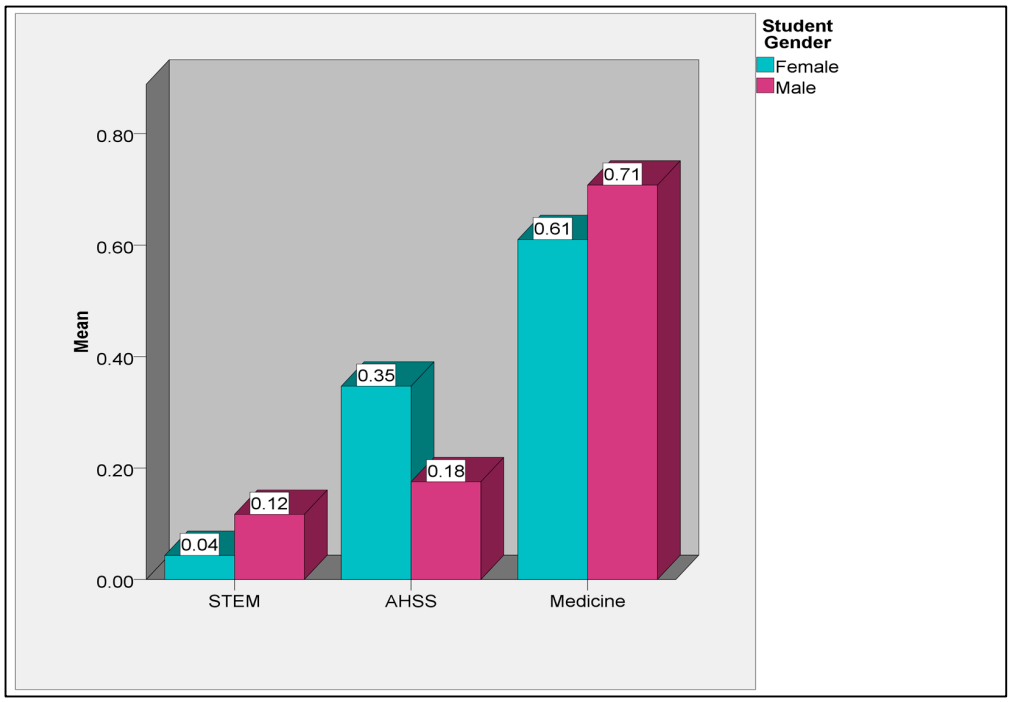

Figure 1. Mean of estimated probabilities for choosing STEM, AHSS, or medicine by gender.

Nevertheless, our findings support socialization theories, suggesting that the gender norms and contexts of students' home countries affect the field in which they choose to study abroad. More generally, our results also support the social value theory of education [76], according to which people choose their studies based on society's expectations. However, the social values and norms associated with different study fields may vary according to the gender equality levels in a specific country. In societies with higher gender equality levels, male and female students may have more diversity, flexibility, and freedom in their educational choices. On the other hand, in societies with high gender inequality, the socially prevalent gender stereotypes and expectations prescribe people's roles and shape their aspirations. There is more rigidity and conformity in male and female educational trajectories in these societies. Consequently, international students' preference for a field of study seems to depend on how gender equality in their home country is related to the demand and appreciation for skills in different sectors or occupations.

Our results also showed that the country of origin's development level significantly predicts the field of study choice among international students (see Figure 2). The human capital theory assumes that individuals are rational actors making educational choices based on the expected costs and benefits of different fields of study [65,66]. Our findings support this perspective as we found that students from developing economies are more likely to choose medicine over STEM than students from developed economies (hypothesis H3B) and that students from economies in transition are less likely to choose medicine over

STEM as a field of study, compared to students from developed economies (hypothesis H3D). However, our findings do not support hypothesis H3A, as students from developing economies were not significantly more likely to choose AHSS over STEM as a field of study than international students from developed economies. Moreover, we did not find support for hypothesis H3C since international students from economies in transition were not significantly less likely to choose AHSS over STEM as a field of study than international students from developed economies. Our results imply that labor market opportunities and rewards significantly shape students' academic choices. Thus, students from different economic contexts have different perceptions and preferences about the profitability and risks of different fields of study [45,67,68].

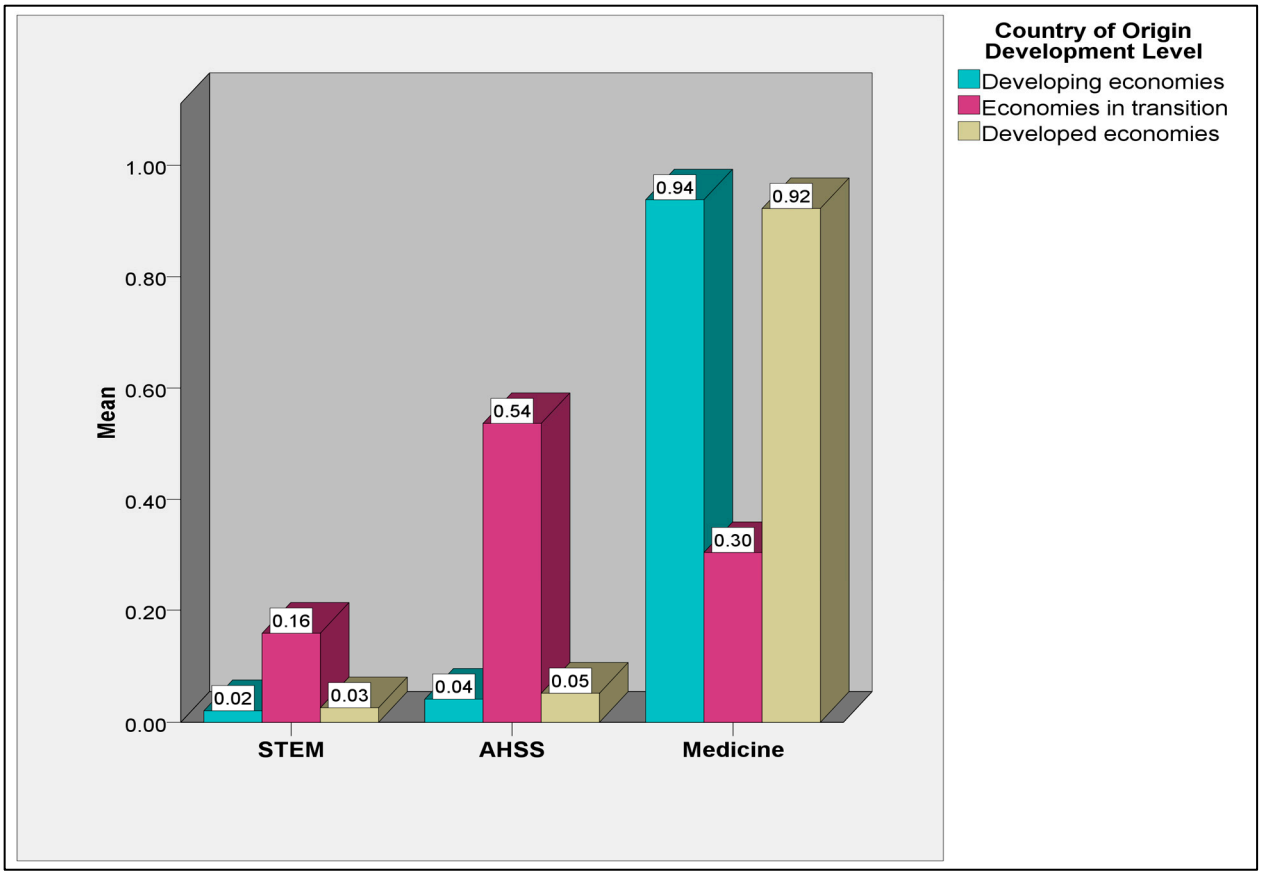

Figure 2. Estimated probabilities for choosing STEM, AHSS, or medicine by students' country of origin development level.

These findings also bring to light several interesting trends worth investigating and exploring more. For example, we described that medicine is the most preferred study field among international college students (over 68% are enrolled in medicine), regardless of gender, home country development level, or gender equality index. This pinpoints that international students consider medicine a prestigious field of study full of rewards. In addition, this pattern can display the more altruistic or humanitarian motivations of medical students. Furthermore, we ascertained that STEM is the least preferred field of study amongst international female students and those coming from gender-equalitarian societies. This suggests that international students perceive STEM as a difficult and uncertain field of study. This conclusion raises a few questions and has significant connotations for the University of Oradea and other higher education institutions that aim to draw and withhold international students and promote gender equality and diversity in STEM fields. The University's student body internationalization and diverseness efforts should focus on the prestige advancement and availability of AHSS and STEM field study programs in

foreign languages. This could attract more international students interested in these fields and unknowledgeable of the Romanian language. Likewise, the University of Oradea should promote more intensely female role models who graduated and pursued successful careers in STEM so that it inspires more female students, both domestic and international, to choose STEM fields in which women are still belittled.

More generally, our study contributes to the academic literature concerning gender equality in higher education and allows a broader outlook which takes into consideration the way in which gender, culture, and economic development converge with the complex and dynamic process of the field of study choice among international students. In this context, we highlight the home country's role as a key moderator of gender gaps in major study fields such as STEM, AHSS, and medicine. Our findings advocate that gender segregation in higher education is not universal and inevitable but rather context-reliant, which reveals the interaction of individual factors and macrolevel settings. Consequently, we argue that policies and interventions to bridge gender gaps in different academic fields should be adjusted to the specific needs and features of various groups of students coming from different countries.

This study also has ramifications for academic institutions and decision-making factors that promote more inclusive and equitable higher education systems and job markets for domestic and international students coming from diverse backdrops. In this scope, we set forth the following four actions. First, academic institutions should provide more information and counseling to international students concerning various study fields, such as their specific requirements, benefits, and challenges. This would allow international students to make more documented and confident choices regarding their academic fields and professional careers. Secondly, academic institutions should also cater more support and resources to international students who pursue untraditional or underrepresented study fields for their gender or home country, such as mentoring, tutoring, counseling, or networking to enable international students to overthrow potential barriers or difficulties in the chosen fields and reinforce their academic success and satisfaction. Thirdly, the political decision-makers should intermediate more collaboration and exchanges among academic institutions and employers from different sectors and countries to increase skill and competency demand and supply in different fields of study. This would generate more opportunities and incentives both for domestic and international students to elect fields that match their skills and interests that are relevant and valuable for their countries or regions' social and economic development. Fourth, political decision-makers should also uphold more initiatives and programs aimed at fostering diverseness-related awareness and appreciation of different study fields and their contribution to the different countries and regions' sustainable economic and social development. This could diminish the existing stereotypes related to gender and chosen study field and would advocate for more inclusive and equitable higher education.

6. Conclusions

In the current paper, we probed how gender, home country economic development, and gender equality indexes affect the field of study choice of international students from the University of Oradea, Romania. We compared students' preferences for three academic fields of study: science, technology, engineering, and mathematics (STEM); arts, humanities, and social sciences (AHSS); and medicine. Generally, our results indicate that students' choices rely on the complex synergy between their gender and the cultural context and economic development level of their home country. More precisely, we discovered that gender is a significant predictor of field study choice among international students. Female students are more prone to choose AHSS or medicine over STEM compared to their male counterparts. This signifies that gender stereotypes and expectations impact students' choices. Furthermore, we found that the home country's gender equality index is a significant predictor of the international students' field study choice. However, we found mixed results for our hypotheses concerning the socialization effects of different

gender contexts at a country level. Higher gender equality does not necessarily lead to more options for AHSS over STEM, but it is connected to more options for medicine over STEM. This implies that gender equality affects the flexibility and diversity of options for both genders in different ways, according to the field study.

We also found that the development level of the home country is a significant predictor of the chosen study field of international students. Nevertheless, we found mixed results regarding our hypotheses about the economic development effect. A lower level of development does not necessarily lead to more AHSS choices over STEM choices but is linked to more options for the field of medicine over STEM. On the other hand, coming from an economy in transition does not entice/drive/lead to less AHSS over STEM choices but is associated with a lesser preference for medicine over STEM. In other words, economic development levels affect students' preferences and motivations originating from different countries and regions, most probably influencing their perception of risks and rewards associated with educational outcomes of different study fields. In summary, our findings show that gender, country of origin development level, and gender equality index are significant predictors of the field of study choice among international students enrolled at the University of Oradea, Romania. However, our findings also reveal complex and sometimes contradictory gender segregation patterns per field of study among international students from different countries and regions. These patterns reflect the manifold interplay between gender, culture, and economic development in shaping students' preferences and decisions regarding their academic paths.

Recognizing the limitations of our current study and aiming at advancing knowledge about the gendered academic choice patterns of international students, we highlight the following specific directions for future research. First, to better understand the causal relations between the dependent and independent variables, we intend to adopt a longitudinal design which tracks the University of Oradea's international students' academic choices in time and in different contexts. For example, a panel survey could follow the same cohort of international students from admission to graduation and could measure their academic preferences, accomplishments, and results across different stages of their educational routes. Secondly, we aim to broaden the scope of this study by designing and administering a questionnaire for a representative sample of domestic and international students to compare their demographic characteristics, academic backdrops, motivations, expectations, experiences, and perceptions of their study fields. Third, to augment the external validity of results and their generalization scope, we shall search for a researchers' network to design and carry out a cross-national comparative study to probe the variations and resemblances of academic choice gendered patterns among international students of higher education institutions of different countries. Therefore, a cross-national comparison between international students of Romania and other countries could be achieved by attempting to delve into the institutional, educational, and social factors that influence students' academic choices. Last but not least, to complement the quantitative analysis methods used in the current study, a mixed-method approach could also be used to investigate the qualitative aspects and nuances of the international students' academic choice, such as their motivations, experiences, and perceptions. For example, semi-structured interviews and focus groups with a subsample of international students who chose different study fields could reveal the stories and meanings behind their academic choices.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su152215820/s1, Dataset regarding the international students enrolled at the University of Oradea (2022–2023) supplemented with the country of origin macrolevel data (.sav format).

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G.W.W.; writing—review and editing, C.F.T., M.I.T., J.P. and G.W.W.; visualization, C.F.T. and M.I.T.; supervision, C.F.T. and M.I.T.; project administration, C.F.T. and M.I.T.; funding acquisition, C.F.T. All authors have read and agreed to the published version of the manuscript.

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