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University reputation, support, and security: explaining changes in educational tourism and economic benefits

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Educational tourism has become a key driver of economic growth in host countries, yet empirical evidence on its determinants remains fragmented. This study contributes to the literature by developing a comprehensive panel data model that integrates both economic (inflation rate, GDP per capita, tuition fees) and institutional (university rankings, student safety) factors to explain international student mobility. Using a dataset of 50 countries for the period 2019–2023 and applying fixed and random effects regression models, the analysis shows that university reputation ($\beta_2 = 0.673$) is the most influential factor, followed by GDP per capita and safety infrastructure, while tuition fees have a significantly negative impact. The findings expand on previous studies by combining multi-country panel data with forecasting methods to project educational tourism flows for 2025–2028. The results confirm the multiplier effect of educational tourism through export revenues, infrastructure development, and human capital formation. This provides policymakers, particularly in emerging economies like Uzbekistan, with practical evidence for developing targeted strategies that enhance international competitiveness in higher education.

KEYWORDS

educational tourism, economic growth, international student mobility, university rankings, higher education, sustainability, educational tourism effectiveness, developing countries

1 Introduction

Internationalization and increasing student mobility have transformed educational tourism into a strategic component of national economies. In addition to tuition fees, international students earn income through accommodation, lodging, and leisure expenses, exerting a measurable impact on the "effectiveness of educational tourism" in host countries' economies (Tarrant, 2010; Hussein et al., 2022). For universities, the desire for global visibility and revenue diversification has intensified competition to attract international students (Maga and Nicolaou, 2018; Alipour et al., 2020).

Existing research identifies a variety of factors influencing student mobility, including institutional reputation, tuition fees, safety, and macroeconomic stability (Osipova and Kazmina, 2021). Conceptual models often distinguish between supply-side determinants (rankings, program quality, infrastructure) and demand-side determinants (cost, visa policies, safety indices) (Tomasi et al., 2020). Although recent studies have expanded our understanding of educational tourism in the post-pandemic era, most remain descriptive

or focus on a single country. For example, Zayim-Kurtay et al. (2025) present a systematic review of how COVID-19 has altered global student mobility patterns and policy responses, highlighting disruptions in both the scale and direction of flows between regions. Similarly, Amaro (2024) examine higher education mobility in Portugal through the lens of academic tourism, highlighting sustainability and destination diversification as emerging priorities. However, empirical studies using econometric approaches based on panel data to analyze the structural determinants of international student mobility across countries remain limited. This methodological gap limits the generalizability of the results and the ability to identify global patterns underlying the effectiveness of educational tourism.

Data from 27 European Union countries were analyzed to assess how participation in international educational mobility programs, such as study abroad, influences students' environmental awareness (Di Pietro, 2025). Rather than analyzing economic or institutional factors, the study focuses on the socio-behavioral aspects of educational tourism, demonstrating that mobility experiences can foster environmentally responsible attitudes among young people. By linking educational tourism to sustainability outcomes, the study demonstrates how international study fosters values aligned with the Sustainable Development Goals (SDGs). Thus, the study highlights the "soft impact" of educational tourism, demonstrating that intercultural interaction can influence personal responsibility toward global environmental issues (Moise et al., 2021).

Although earlier studies such as Beine et al. (2014), Tang (2020), and Solarin et al. (2025) have advanced our understanding of educational tourism, significant analytical and methodological gaps remain. Beine et al. (2014) modeled international student flows through bilateral determinants, but relied on pre-pandemic data and excluded the institutional variables of quality and safety that currently shape global mobility. Tang (2020) demonstrated that educational tourism can stimulate economic growth through threshold effects mediated by research output and ICT development; however, his focus was limited to macroeconomic outcomes rather than the structural factors that attract international students in the first place. Similarly, Solarin et al. (2025) examined the contribution of educational tourism revenue to GDP in the context of a single country (Australia), leaving cross-national determinants of mobility unexplored. Taken together, these studies highlight the economic impact of educational tourism but ignore its determinants in different economic and institutional settings.

This study addresses a critical research gap by integrating economic, institutional, and security factors of international student mobility into a single panel data model, going beyond previous studies that have examined these factors separately or in a single-country context (Beine et al., 2014; Tang, 2020; Solarin et al., 2025; Amaro, 2024). It evaluates the relationship between five key factors—inflation, tuition fees, institution rankings, student safety, and GDP per capita—and international student inflows. This adds new empirical evidence to the ongoing debate about the effectiveness of educational travel (Rezapouraghdam et al., 2018). The results highlight the importance of striking a balance between accessibility, institution quality, and safety infrastructure for developing countries, particularly those in Central Asia, to improve their competitiveness in the global education market.

2 Theoretical framework

2.1 Educational tourism effectiveness

The effectiveness of educational tourism can be broadly defined as the contribution of international student mobility and associated economic activity to the overall development of host countries (Hernández-Torrano et al., 2024). It reflects both the academic attractiveness and the economic significance of higher education as a global service sector. Two interrelated indicators assess this effectiveness. The first is volume, reflecting the number of international students enrolled in higher education institutions, and the second is value, which includes revenue from tuition fees, student living expenses, and the broader multiplier effect on housing, retail, transportation, and employment (Cárdenas et al., 2016).

Globally, the number of internationally mobile students has more than tripled over the past two decades, reaching between 6.4 and 6.9 million in 2023 (Migration Data Portal, 2024; ApplyBoard, 2024; Times Higher Education, 2023). This massive influx of students generates approximately US$300 billion annually for host economies through education exports and consumption-related spending. Leading destinations such as the United States, United Kingdom, Canada, Australia, Germany, and France dominate this market (World Bank, 2023). The United States alone hosted over 1.1 million international students in the 2023/24 academic year, contributing nearly US$44 billion to its national economy and supporting nearly 380,000 jobs in related sectors (Lumos Capital Group, 2024). Similar trends are observed in the United Kingdom, which hosts over 730,000 international students annually, and Canada, which currently hosts approximately 840,000—a number equal to nearly 40% of the total number of people receiving higher education (UNESCO Institute for Statistics, 2023).

Countries are strengthening their position in the field of educational tourism through three strategic mechanisms: (1) marketing and recruitment initiatives, including international partnerships and scholarship programs; (2) quality control and improving global rankings, which strengthens the institution's reputation and academic competitiveness; and (3) visa and work permit reforms designed to make study places more accessible and stimulate graduate employment (Paige et al., 2009). Although marketing expenditures are positively correlated with student enrollment, they are primarily considered as inputs rather than outputs when evaluating effectiveness. Therefore, the number of international students and education export revenues remain the most reliable indicators of success (Glover, 2011).

Ultimately, the effectiveness of educational tourism depends on a country's ability not only to attract but also to retain international students, as long-term partnerships, expressed through graduate employment, research collaboration, and innovative interaction, extend far beyond tuition income (Kwak and Maia, 2024). Thus, educational tourism is a strategic factor in human capital

formation, cultural exchange, and sustainable economic growth within the global knowledge economy (Apollo et al., 2025).

Building on previous discussions of educational tourism outcomes (Cárdenas et al., 2016; Kwak and Maia, 2024; Apollo et al., 2025), the present study develops an original causal model (Figure 1) to illustrate how policy inputs and institutional mechanisms translate into measurable educational tourism effectiveness.

The "Causal Model of Educational Tourism Effectiveness" presented above depicts the dynamic interaction between policy factors, institutional processes, measurable outcomes, and long-term development outcomes in host countries. At the top of the table are five key factors: marketing and recruitment initiatives, institutional quality and rankings, visa and work permit policies, economic context (GDP per capita and inflation), and security infrastructure. These factors are fundamental to the process of attracting international students. This process leads to a number of outcomes, including international student numbers, volume and cost indicators, tuition revenue, and living expenses in the local economy. These outcomes lead to various benefits, including human capital development, information transfer, cultural exchange, and collaboration in innovation and research. Collectively, these outcomes have a decisive impact on promoting long-term economic growth and enhancing the host country's global competitiveness.

The cyclical mechanisms in the model show that when educational tourism improves a country's economic performance and international reputation, it also enhances future marketing effectiveness, institutional legitimacy, and security infrastructure. Thus, the effectiveness of educational tourism is viewed as a self-reinforcing cycle in which policy measures and educational quality contribute to economic and social benefits, thereby enhancing the country's attractiveness and sustainability in the global higher education market.

2.2 Factors that determine educational tourism

To understand the effectiveness of educational tourism in a country, it is necessary to examine the multifaceted factors that influence international student mobility decisions. External economic factors, such as the inflation rate, affect the real cost of education and living, making countries more or less attractive to potential students (Li and Huimin, 2020). The presence of highly ranked universities is an indication of the quality of academic education and improves the employability of graduates, acting as a major pull factor.

The first factor, the inflation rate, affects the purchasing power of international students and the real value of their investment in education. High inflation rates can discourage students by increasing uncertainty about future costs and reducing the value of savings allocated for education (McGladdery and Lubbe, 2017). Countries with stable, low inflation rates provide a more predictable spending environment, which facilitates long-term educational planning.

After assessing economic stability, the reputation of the institution becomes a critical factor. The number of universities ranked in international rankings (such as QS, THE or ARWU Top 1,000) serves as an indicator of the quality of their academic education and research excellence (Tang, 2020; QS World University Rankings, 2023). These rankings influence student perceptions and choices, as higher-ranked institutions are associated with better career prospects and stronger alumni networks (Artigas et al., 2014).

Tuition fees are a direct economic barrier or enabler of educational tourism. While some countries market themselves as low-cost destinations to attract price-sensitive students, others use premium pricing strategies that take into account perceived quality (Bhatt et al., 2024). The relationship between tuition fees and student flows is complex and can vary depending on the income level of the home country and the availability of scholarships.

Safety infrastructure, measured by student safety indices, reflects the level of safety for international students. This includes campus security, crime rates and social stability factors that influence where parents and students choose to study (Solarin et al., 2025). Countries with high safety standards and support systems for international students tend to attract more students (Dudley et al., 2024). Finally, GDP per capita serves as an indicator of overall economic development and standard of living in the host country. Higher GDP per capita is often correlated with developed infrastructure, healthcare systems, and quality of life factors that improve the quality of education for international students (Sánchez-Rivero and Rodríguez-Rangel, 2021).

Accordingly, the following hypotheses are put forward:

H1: Inflation rate negatively affects international student enrollment in host countries.

H_2: The number of universities in the top 1000 rankings positively affects international student enrollment.

H3: Tuition fees have a non-linear relationship with international student enrollment.

H4: Student safety index has a positive effect on international student enrollment.

H5: GDP per capita has a positive effect on international student enrollment.

3 Methodology

3.1 Data collection and sample

This study uses a panel data analysis of 50 countries over a five-year period (2019–2023) to examine the determinants of educational tourism. The sample was selected based on data availability and representativeness across countries at different levels of economic development, including 7 developed countries and 43 developing/transition economies. The sample ensured geographic diversity, covering Central Asia, Europe, Asia-Pacific, the Americas, the Middle East, and Africa.

An unbalanced panel of 50 countries for the period 2019–2023 was constructed. Data on international student enrollment are taken from the UNESCO Institute for Statistics (UIS.SB.SCED.TERT.INSTUD indicator). GDP per capita

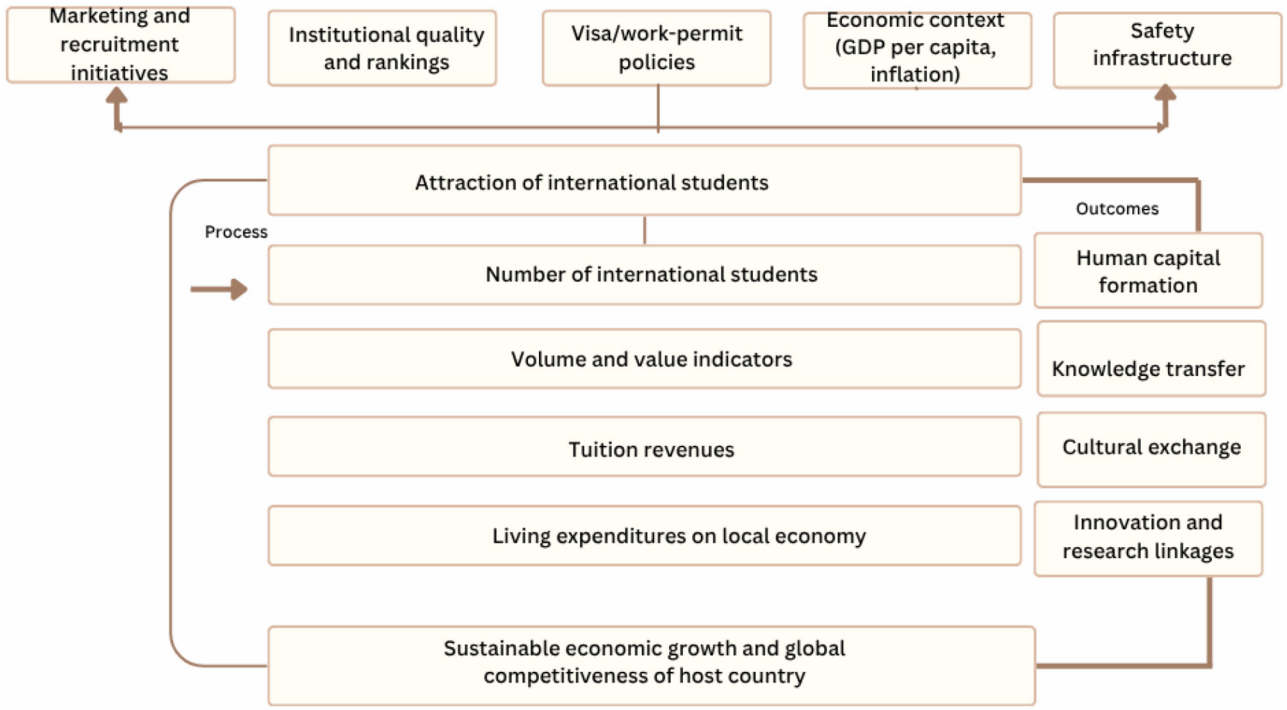

FIGURE 1
Conceptual model of educational tourism effectiveness.[1]

(NY.GDP.PCAP.KD) and inflation (FP.CPI.TOTL.ZG) are taken from the World Bank's World Development Index. Tuition fees for international students are taken from the OECD's Education in General and data from national regulatory authorities in non-OECD countries. Reputation is determined by the number of universities in the top 1,000 of the QS rankings (2020–2024 editions, aligned with academic years); reliability is assessed by z-averaging the number of universities across QS, THE, and ARWU. Safety is measured by the reverse-coded Global Peace Index (IEP), so that higher values correspond to greater safety (the Gallup Law and Order Index and the WGI Political Stability Index are used to assess robustness). Continuous positive variables are log-transformed; rankings use ln (1 + x); safety is standardized. Off-year tuition gaps are linearly interpolated over two years; otherwise, we use tablewise deletion. Continuous regressors are winsorized at the 1st/99th percentiles.

Country-fixed effects models are estimated using year dummies. Panel diagnostics include the LLC and IPS unit root tests, the Wooldridge serial correlation test, the modified Wald test for heteroscedasticity, and the Pesaran test for CD-dependence. Given heteroscedasticity and cross-sectional dependence, we present Driscoll-Krai standard errors (lags = 2), and for robustness, we present cluster stability and PCSE. We compare FE and RE using the Hausman test and present the RE and Mundlak-RE results in the appendix.

1 Elaborated by the authors.

3.2 Variable specification

Dependent variable (Y): Number of inbound educational tourists (international students staying for more than3 months).

Independent variables:

X1: Inflation rate (%)—annual change in the CPI

X_2: Number of universities in the top 1,000 of the QS/THE ranking

X3: Average tuition fees (PPP-adjusted, USD)

X4: Student safety ratio (composite index 0–100)

X5: GDP per capita (current USD)

The full data dictionary is presented in Appendix Table A, which lists the variable definitions, units of measurement, and data sources. The dependent variable is the number of international students (UNESCO UIS.SB.SCED.TERT.INSTUD). The key regressors are GDP per capita (in constant 2015 US dollars, WDI NY.GDP.PCAP.KD), inflation (CPI %, FP.CPI.TOTL.ZG), tuition fees (Table B5 Education in General, PPP-adjusted US dollars), a safety index (Global Peace Index, reverse-coded), and university reputation (number of institutions in the top 1,000 QS rankings). All data are annual, referenced to the academic years 2019–2023, and harmonized using common units of measurement and base years.

a **Data preparation and transformation**

All continuous variables are uniformly log-transformed to stabilize variances and interpret coefficients as elasticities, with the exception of restricted indices (e.g., student safety: scale from 0 to

100, inflation rate in %). Specifically, ln (Y), ln (GDP per capita), and ln (tuition fees) are used, with inflation and safety fees entered as levels.

Missing data (<3% of the total number of observations) are handled by linearly interpolating tuition fees and GDP per capita for a single year if only adjacent years exist (which is common in the OECD Education at a Glance data). Observations missing for more than one consecutive year are excluded, maintaining a balanced panel of 50 countries × 5 years ($n = 250$).

3.3 Econometric model specification

Panel data were estimated using fixed effects (FE) and random effects (RE) models:

$$\ln Y = \sum_{j=1}^{50} a_i z_{ij} + \beta_1 x_{it}^{(1)} + \beta_2 x_{it}^{(2)} + \beta_3 \ln x_{it}^{(3)} + \beta_4 x_{it}^{(4)} + \beta_5 \ln x_{it}^{(5)} + \varepsilon_{it} \quad (1)$$

where a_i takes into account unobserved country effects.

A Hausman test was conducted to determine the appropriate estimator. The results clearly confirmed the advantage of the fixed-effects model ($\chi^2 = 18.47$, $p < 0.01$), confirming the correlation of country heterogeneity with the covariates. Before estimation, stationarity and serial correlation properties of the panel are verified.

Both fixed-effects (FE) and random-effects (RE) specifications were estimated. The Hausman test ($\chi^2 = 18.47$, $p < 0.01$) rejected the null value of orthogonality between the regressors and unobserved effects, favoring the FE estimate.

Nevertheless, the RE results were presented in a robustness table (Table 2) to demonstrate the stability of the coefficient signs and magnitudes (β_2 [FE] = 0.034 vs. β_2 [RE] = 0.031). This transparency underscores the robustness of the FE inference and mitigates potential bias caused by correlated unobserved heterogeneity. The results of the reliability check for the RE specification are given in Table of the Appendix Table A.

a **Diagnostics and estimation procedures**

Given the short time interval ($T = 5$), panel unit root tests (LLC) and Im-Pesaran-Shin (IPS) tests are conducted for all continuous variables. The results confirm stationarity at the log-transformed level ($p < 0.05$) for all regressors, confirming the standard FE/RE estimator without first-difference analysis. To account for potential serial correlation, a Wooldridge test for autocorrelation in panel data is conducted ($F = 1.82$, $p = 0.17$), indicating the absence of significant serial correlation in the residuals.

- Multicollinearity: tested using pairwise correlations, VIF values (<3.5 for all variables), and the Fisher exact test. No significant multicollinearity was detected.
- Model Estimation: The endpoint regression equation for the base country (Uzbekistan) was as follows:

$$\ln Y = 6,72 + 0,012x_1 + 0,034x_2 - 0,33 \ln x_3 + 0,01x_4 + 0,53 \ln x_5 + \varepsilon \quad (2)$$

- Goodness of fit: The overall model fit coefficient, R^2, was 0.72 (within $R^2 = 0.68$; between $R^2 = 0.75$), indicating high explanatory power.
- Significance testing: A Student's *t*-test was applied to all coefficients. The results showed that university rankings ($p < 0.001$), GDP per capita ($p < 0.01$), and tuition fees ($p < 0.05$, negative) were highly significant predictors. Inflation ($p < 0.10$) and safety ($p < 0.05$) also contributed significantly, albeit to a lesser extent.

3.4. Standardized regression analysis

To compare the relative influence of predictors, standardized coefficients were calculated:

$$t_y = \sum \beta_j t_{x_j} \quad (3)$$

The standardized equation was:

$$t_y = 0.15X1 + 0.673X2 - 0.764X3 + 0.136X4 + 0.29X5 \quad (4)$$

confirming that university rankings ($\beta_2 = 0.673$) are the dominant factor.

3.5 Forecasting methodology

Forecasts for 2025-2028 were generated using the estimated model with projected values of independent variables. The forecasting equation:

$$Y = e^{6,72} \bullet e^{0,012X_1} \bullet e^{0,034X_2} \bullet x_3^{-0,33} \bullet e^{0,01X_4} \bullet x_5^{0,53} \quad (5)$$

The model projects a 13% average annual growth rate in educational tourism arrivals, assuming improvements in institutional ratings and infrastructure.

Projected values for independent variables were obtained from the Institute of Forecasting and Macroeconomic Research and national statistical agencies.

3.6 Software and statistical tools

All statistical analyses were performed using Stata 17.0 for panel data estimation and SPSS 28.0 for diagnostic tests. Matrix calculations for multicollinearity analysis were conducted using MATLAB R2023a.

4 Results

4.1 Descriptive statistics and sample profile

A balanced panel dataset for 50 countries for the period 2019–2023 (250 annual observations per country) was compiled. Table 1 presents country data for 2023 (inflation, number of universities in the top 1,000, tuition fees, student safety, and GDP per capita), as well as educational tourism data. A visual overview (Figure 1) shows the distribution of educational tourism arrivals between developed and non-developed countries: developed countries account for 54.4% of educational tourism arrivals, while the remaining 43 countries account for 45.6%.

The data from the table formed based on the 2023 statistical information above is also illustrated in diagram form. As emphasized above, the statistical data of developed countries will be presented separately, and the statistical data of the remaining 43 countries in aggregate. The diagram appears as follows (Figure 2):

4.2 Econometric results

4.2.1 Model selection and fit criteria

Fixed effects (FE) and random effects (RE) models were estimated. The Hausman test favors FE ($\chi^2 = 18.47$, $p < 0.01$), indicating a correlation between country effects and the regressors; FE is used for inference. The model fit is good (overall $R^2 = 0.72$; within $R^2 = 0.68$; between $R^2 = 0.75$).

4.2.2 Baseline FE regression

Estimated FE specification:

$$\ln Y = 6,72 + 0,012x_1 + 0,034x_2 - 0,33\ln x_3 + 0,01x_4 + 0,53\ln x_5 + \varepsilon \quad (6)$$

For transparency, Table 2 reports 95% confidence intervals and exact p-values alongside effect sizes to illustrate the precision and reliability of each estimate.

Each additional university in the top 1,000 is associated with a +3.4% increase in arrivals (elasticity = 0.034). This is the maximum standardized effect.

A 1% increase in tuition costs is associated with a 0.33% decrease in arrivals (elasticity = -0.33).

A 1% increase is associated with a 0.53% increase in arrivals (elasticity = 0.53), reflecting the impact of infrastructure/quality of life.

A one-point increase in the safety index, ranging from 0 to 100, corresponds to an increase in arrivals of approximately 1.0%.

A one-percentage-point increase is associated with an increase in arrivals of approximately 1.2% (elasticity = 0.012). The sign and magnitude suggest that inflation may be affecting demand or the exchange rate - discuss this as a context-dependent effect and consider a robustness check (below).

4.2.3 Relative importance (standardized coefficients)

Standardized regression identifies ratings as the dominant predictor:

$$t_y = 0.15x_1 + 0.673x_2 - 0.164x_3 + 0.136x_4 + 0.29x_5 \quad (7)$$

4.2.4 Robustness and diagnostics

Both fixed-effects (FE) and random-effects (RE) specifications are estimated. The Hausman test ($\chi^2 = 18.47$, $p < 0.01$) reject the null value of orthogonality between the regressors and unobserved effects, favoring the FE estimate.

Nevertheless, the RE results are presented in a robustness table (Appendix Table B in the Appendix) to demonstrate the stability of the coefficient signs and magnitudes (β_2[FE] = 0.034 vs. β_2[RE] = 0.031). This transparency underscores the robustness of the FE inference and mitigates potential bias caused by correlated unobserved heterogeneity.

Multicollinearity does not bias the estimates: pairwise correlations and variance inflation factors remain below 3.5 for all regressors, and the Fisher Type II test indicates no instability in the design matrix, so the inference is not driven by collinearity. The results are also insensitive to outliers and highly leveraged observations; consistently excluding large host countries (such as the US and UK) and episodes of very high inflation keeps the coefficients within the same significance range and of similar magnitude. Inference is based on country-clustered robust standard errors, and the results remain consistent when re-estimating using Driscoll-Kraay standard errors. Finally, replacing the student safety variable with the Global Peace Index sub-indices yields coefficients with the same signs and comparable significance levels. Taken together, these diagnostic tests confirm the robustness of the baseline fixed-effects estimates.

4.3 Forecasts (2025–2028)

Using the FE coefficients and external forecasts for X1–X5, inbound educational tourism to Uzbekistan (policy rationale) is projected. The inbound and outbound data are presented below (Table 3).

The compound annual growth rate (CAGR) for the period 2025-2028 is approximately 13.0% under the stated assumptions. The forecast is most sensitive to improvements in rankings and GDP per capita and negatively affected by increases in tuition.

5 Discussion

The results reveal a simple pattern: students choose to study where they can afford it, feel safe, and perceive quality. The strongest factor, according to our data, is visible signals of quality (a higher number of universities in the top 1,000 global universities). These are followed by the country's overall prosperity and standard of living (measured by GDP per

TABLE 1 Factors Affecting Educational Tourism by Country (2023).[2]

No	Countries	Inflation rate	Number of universities in top 1000 rankings	Average tuition fees (contract)	Student safety coefficient (100 points max)	GDP per capita	Educational tourism arrivals
1	Uzbekistan	8,77%	0	3004	93	2495,6	11051
2	Kazakhstan	20,3	13	4000	NA	32690	40742
3	Turkiye	64,8	36	8500	71	41410	185047
4	Denmark	8,5	5	11000	94	73390	31478
5	Austria	10,2	8	1452	89	69500	75870
6	Belgium	10,35	9	1555	82	65500	54080
7	Czech Republic	15,1	11	2000	90	50960	47768
8	Finland	7,1	9	8000	97	69000	23591
9	Greece	9,6	5	3500	78	39480	22429
10	Italy	8,1	33	2834	78	54220	58508
11	Latvia	20,8	3	7000	85	40260	10148
12	Poland	17,9	15	1686	85	45340	62091
13	Sweden	11,5	8	9700	88	65840	31935
14	Switzerland	3,5	10	1373	92	87960	57972
15	Argentina	94,8	14	2500	70	27200	121577
16	Kyrgyzstan	14,7	1	3000	NA	6250	61418
17	Australia	7	36	5939	81	65370	458279
18	Russia	12,1	33	3780	NA	34840	395263
19	Malaysia	3,4	18	3396	73	36850	92519
20	South Korea	5,1	31	3655	88	56710	111568
21	Singapore	6,1	3	9112	98	133890	54982
22	China	1,9	59	3000	73	23380	221653
23	India	6,7	27	2816	63	9070	48040
24	Great Britain	9,1	81	11405	86	56470	550877
25	Ukraine	20,2	6	1416	89	13900	68739
26	Canada	6,8	27	9176	89	60180	323157
27	Brazil	9,3	13	5314	60	18690	22364
28	Mexico	7,9	15	3364	63	23820	43458
29	Saudi Arabia	2,5	14	13000	79	64840	63417
30	UAE	4,8	11	12535	85	88220	219878
31	Indonesia	4,2	9	2316	68	15860	6000
32	South Africa	6,9	7	3862	54	16090	36050
33	Spain	8,3	24	4882	85	49450	82269
34	France	5,9	24	2785	76	58830	252444
35	Hong-Kong	7,9	7	4988	80	74600	46933
36	New Zealand	1,3	8	5439	79	54050	43700
37	Bulgaria	13	1	3200	74	32010	17575
38	Pakistan	12,1	7	4000	74	6840	10000

(Continued)

TABLE 1 (Continued)

No	Countries	Inflation rate	Number of universities in top 1000 rankings	Average tuition fees (contract)	Student safety coefficient (100 points max)	GDP per capita	Educational tourism arrivals
39	Belarus	12,8	2	1550	74	23450	22375
40	Israel	5,3	6	9442	88	55000	13277
41	Japan	2,5	38	8132	89	51810	222661
42	Egypt	30,6	3	3000	71	16980	34198
43	Bangladesh	6,2	2	2000	NA	8660	2100
44	Iran	53,4	5	3500	NA	19550	24379
45	Malta	6,13	1	10500	NA	61940	2414
46	Chile	12,8	8	5757	74	29610	12832
47	Irak	5,26	1	3000	NA	12930	12000
48	Thailand	6,08	8	3500	67	22680	25086
49	Germany	8,6	44	10000	83	66130	368717
50	USA	6,5	146	27091	75	80030	957475

[2]Elaborated based on the information taken from https://n26.com/en-eu/the-education-price-index
https://www.worlddata.info/inflation.php,
https://en.wikipedia.org/wiki/List_of_countries_by_GDP_(PPP)_per_capita,
www.commonfund.org (https://www.commonfund.org/research-center/press-releases/2023-higher-education-price-index-hepi-report-released).

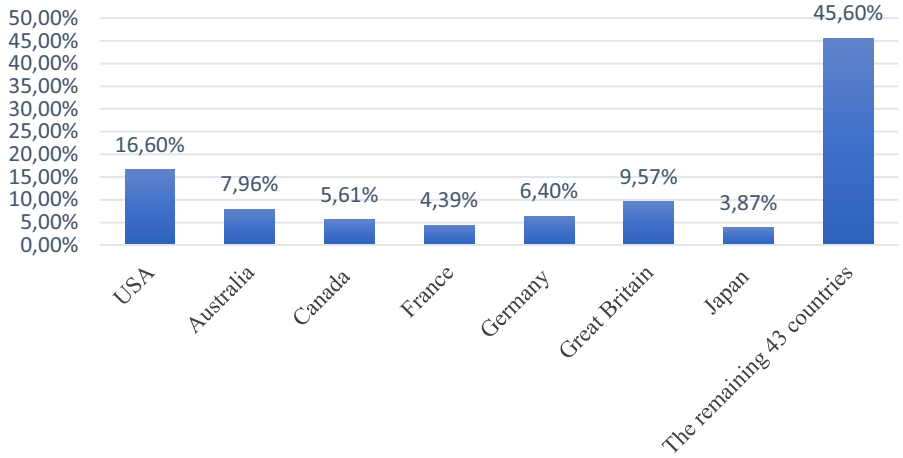

FIGURE 2
Percentage of tourists visiting for educational tourism in 50 countries.[2]

capita), as well as a certain sense of security. Naturally, high tuition fees deter students. Although it has a lesser impact and varies depending on the situation, inflation is also important.

These results extend the existing literature by focusing on the determinants of educational tourism rather than its macroeconomic outcomes. Solarin et al. (2025) demonstrated that educational tourism revenues contribute to national growth through a tourism-based mechanism, but their analysis remained largely aggregated. Our model decomposes these effects to the institutional level, highlighting how economic stability and reputational capital jointly predict mobility flows. Similarly, Bhatt et al. (2024) quantified the elasticity of tuition fees in global demand for higher education; our results confirm this negative elasticity but further show that it is moderated by security and institutional prestige—two factors not jointly modeled in previous studies. The results also complement the work of Tang (2020), who identified nonlinear thresholds linking educational tourism and economic growth, showing that incremental improvements in perceived quality and safety generate disproportionately large returns for developing systems.

2 Elaborated by the authors.

TABLE 2 Results of fixed effects regression (dependent variable: ln arrival)[4].

Variable	Coefficient (β)	Std.Error	95% Confidence Interval	t-statistic	p-value	Significance
Inflation (X1, pp)	0.012	0.006	[-0.001, 0.025]	1.93	0.058	*
Universities in Top-1000 (X_2, count)	0.034	0.007	[0.020, 0.048]	4.86	0.000	***
Tuition fees (lnX3, PPP USD)	−0.33	0.15	[-0.625, -0.035]	−2.20	0.030	**
Safety (X4, 0-100)	0.01	0.004	[0.002, 0.018]	2.38	0.021	**
GDP per Capita (lnX5, USD)	0.53	0.11	[0.314, 0.746]	4.81	0.000	***
Country FE	Yes					
Time FE (optional robustness)	Report					
Observations	*250*					
Within R^2/Overall R^2	*0.68/0.72*					
Hausman (FE vs. RE)	X^2=*18.47, p < 0.01*					

Robust Ses clustered by country. Significance: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.
[4]Elaborated by the authors.

TABLE 3 Forecast inputs (Uzbekistan, 2025-2028)[5]

Year	Inflation	Top-1000 univ	Tuition (USD PPP)	Safety (0-100)	GDP pc (USD)
2025	8	3	3,400	95	2,591
2026	5	5	3,400	96	2,857.2
2027	6	8	3,600	96	3,212.3
2028	6	10	3,800	97	3,564.7

[5]Elaborated by the authors.

A potential endogeneity problem arises from the two-way relationship between a university's reputation and student influx: a strong student intake can boost visibility and rankings. To address this issue, fixed-effects modeling accounts for unobserved country characteristics, but future research should use instrumental variable methods or dynamic panel methods (e.g., lagged rankings, exogenous policy shocks) to more accurately establish causal relationships. Understanding this feedback loop will help us better interpret educational tourism as a cause and effect of academic competitiveness.

In terms of sustainability, the results link educational tourism to several UN Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 17 (Partnerships for Sustainable Development). International student mobility promotes intercultural competence, human capital formation, and research collaboration, which together contribute to sustainable economic diversification. However, sustainability in this sector goes beyond economics: host universities must minimize environmental impact, ensure social inclusion, and promote ethical recruitment practices.

Integrating sustainability indicators such as carbon-neutral operations, equal access to scholarships, and transparent institutional governance into higher education internationalization frameworks will help align academic mobility with broader goals of sustainable and inclusive global development.

5.1 Implications for developing countries

Three factors are particularly noteworthy for Uzbekistan and its neighbors.

1) Make quality visible, not just real.

Rankings and international recognition reflect perceived academic quality. Small but consistent steps, such as increasing the number of publications with international co-authors, attracting highly qualified faculty, improving doctoral programs, and conducting alumni and employer surveys, can increase a university's visibility globally. Uzbekistan can position itself as a regional academic hub if Central Asian universities develop joint doctoral programs, shared research laboratories, and co-branded diplomas. These initiatives extend the university's reputation beyond national borders and create a recognizable "brand for Central Asian higher education."

2) Make safety a promise parents trust.

Families value safety as highly as students themselves. Universities can set themselves apart by providing guaranteed housing for first-year students, well-lit routes between campus and

the city, 24-h language hotlines, and clear emergency protocols. Publishing a simple safety dashboard (information on incidents, response times, and support services) turns quiet and good work into visible commitments.

3) Compete based on overall tuition costs, not price tags.

High tuition costs reduce demand, so it's important to develop a pricing policy. The solution isn't a race to the bottom. Reasonable accessibility is the answer: regional scholarships for priority subjects, income-linked payment options, early decision discounts, and paid internships to cover living expenses. Uzbekistan could use mobility and Erasmus-style dual degree programs, while Kazakhstan, Tajikistan and Turkmenistan could develop short-term programs that count toward a full degree. This reduces initial costs without compromising requirements.

4) Increase the number of English-taught programs and the availability of learning resources.

One of the main barriers to international enrollment in many developing countries is the limited availability of English-taught instruction. Expanding the number of English-taught undergraduate and graduate programs could significantly increase their visibility and accessibility globally, particularly for students from Asia, Africa, and the Middle East. To improve cost-effectiveness, universities could include English-taught textbooks and learning materials in tuition fees, ensuring students have no hidden costs. This approach also demonstrates a commitment to global academic standards and inclusiveness.

5) Incorporate internships and practical training into the curriculum.

Today's international students increasingly seek practical experience and employment opportunities alongside their academic education. Incorporating internships, practical training, and practical training opportunities as integral components of educational programs covered by tuition increases the perceived value of studying in developing countries. Partnerships with local businesses, tourism companies, and government agencies can provide such opportunities, promoting both skills development and regional economic integration.

By combining quality assurance, security transparency, affordability, English language accessibility, and practical training, developing countries like Uzbekistan can attract a larger share of international students while simultaneously enhancing the competitiveness and sustainability of their higher education systems.

5.2 What can governments do?

Governments can incentivize universities by establishing reputation agreements—national funding tied to key performance indicators linked to rankings, such as faculty citations, faculty-to-student ratios across countries, and employer reputation—implemented through competitive research consortia linking Uzbekistan with Kazakhstan, Tajikistan, and Turkmenistan in priority areas such as healthcare, energy transition, and artificial intelligence. They could also invest in safety infrastructure by co-financing safety corridors between campuses and cities, standardizing student insurance, and implementing compatible event notification systems across all universities. Visa and pricing policies should be "smart": simplified student visas with clear post-graduation employment rights (12-24 months) and regional scholarship systems to attract students from neighboring countries.

5.3 What can universities do tomorrow?

At the institutional level, efforts to enhance international visibility, student satisfaction, and employability can yield quantitative results in a short time. While doctoral programs enhance the prestige of research, undergraduate and graduate programs are the primary drivers of internationalization, ensuring significantly higher student enrollments and international mobility. Therefore, universities should combine intensive research with volume-oriented approaches that expand access, ensure quality, and improve student learning.

1) Develop an academic core focused on internationalization at all levels of education.

Instead of focusing solely on doctoral programs, universities should develop international undergraduate and graduate programs, particularly English-taught programs with globally relevant content and learning outcomes. Doctoral education remains essential for long-term scientific excellence, but undergraduate and graduate programs are a true gateway for international students. Providing faculty with bibliometric and digital teaching tools, setting goals for international co-authorship, and inviting lecturers from partner universities can contribute to improving knowledge at all levels of education.

2) Integrate safety, care, and wellbeing into the university's identity.

Universities can quickly enhance their appeal by offering first-year international students on-campus or in residence halls with internet access, setting clear service standards (e.g., response times, availability of consultations), and consistently communicating with parents and sponsors. When students choose to study abroad, as has been proven elsewhere, a strong reputation for safety often outweighs the difference in tuition costs. Developing an online dashboard for safety and student support can transform a university's best practices into tangible competitive advantages.

3) Improving accessibility and employability at the entry-level level.

To expand access, colleges should implement tiered tuition payment schemes and targeted scholarships, as well as work-integrated learning programs such as internships, practical projects, and assistantships, which are already covered by tuition. Transparent data on employment and wages gives families confidence in the return on investment. Short-term internships or professional assignments, especially for master's students, increase the perceived value of education in Uzbekistan and the Central Asian region.

4) Encourage campus collaborations beyond doctoral research.

Inviting campuses from leading universities can enhance the quality of academic research, but the benefits extend far beyond joint doctoral programs. Such campuses can offer dual-degree

undergraduate and graduate programs, joint laboratories for practical research, and co-branded master's programs with rigorous quality assurance systems. Collaboration in teaching, not just research, means that most international students, especially those in their junior years, directly benefit from international relationships.

Combining these measures with strict safety measures, affordable pricing models, English-language instruction, and integrated internships enables universities in developing countries to achieve long-term growth in international student enrollment. This balanced approach combines research transparency and inclusive education, ensuring that internationalization positively impacts both academic reputation and social impact.

5.4 Limitations

It is identified that clear patterns, but more detailed data would be useful. Longer time horizons and program-specific information (field of study, language of instruction, and post-graduation professional skills) could refine the estimates, particularly with regard to tuition costs and safety. Future research should examine whether effects vary by discipline, language policy, and visa/labor regulations, as well as how educational tourism impacts local labor markets and innovation.

Bottom line is that the winning combination for Central Asia is genuine quality, demonstrable safety, and reasonable accessibility, all delivered simultaneously. Countries and universities that achieve progress in all three areas will attract, retain, and graduate more international students, as well as reap the associated economic and social benefits.

6 Conclusion

This study empirically demonstrates that international student mobility—the foundation of educational tourism—is driven primarily by university prestige, economic prosperity, and perceived safety, while accessibility acts as a moderating factor. The results, based on a balanced sample of 50 countries from 2019 to 2023, indicate that credible signals of quality, defined by the presence of globally recognized universities, had the greatest positive impact on incoming student flows. These findings help explain how the combination of academic status, safety, and accessibility influences the effectiveness of educational tourism systems.

This study builds on previous research and incorporates both economic and institutional variables into a single panel model. Unlike previous studies, which focused primarily on macroeconomic outcomes or threshold effects, this analysis identifies micro-level factors—tuition policy, rankings, and security infrastructure—that influence cross-border educational mobility. The analytical contribution lies in demonstrating the strength of these correlations across diverse national contexts, enabling the development of a scalable methodology for assessing the effectiveness of educational tourism in both developed and developing countries.

From a policy perspective, developing countries like Uzbekistan can enhance their competitiveness by translating genuine quality into perceived global superiority. Governments should coordinate research and assessment funding, encourage joint international degree programs, and invest in student safety by providing housing, insurance, and efficient transportation between universities and the city. Universities should expand English-language programs, integrate internships and practical training into the curriculum, and offer important learning resources within programs to improve accessibility. Additional initiatives such as income-based payments, regional scholarships, and clear post-graduation work rights can improve accessibility while simultaneously facilitating the long-term attraction of international students.

While this analysis identifies important economic and institutional determinants, future research should use instrumental variables or dynamic panel models to examine potential endogeneity between reputation and mobility. Extending the time horizon and integrating disciplinary, language, and visa variables would allow for a more nuanced examination of the diversity of effects across educational levels and fields of study. Furthermore, incorporating sustainability indicators into empirical models, such as carbon-neutral operations, equitable scholarship distribution, and transparent governance, could shed light on how educational tourism contributes to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 17 (Partnerships for the Goals).

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

NO: Investigation, Methodology, Writing – original draft. AJ: Software, Writing – review & editing. NM: Data curation, Formal analysis, Writing – review & editing. MU: Project administration, Resources, Writing – original draft. AZ: Visualization, Writing – review & editing.

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Appendix Table A

TABLE A1 Robustness check of model specifications (FE and RE estimations, 2019-2023).

Variable	Fixed Effects (FE) β (SE)	Random Effects (RE) β (SE)	Significance
ln(GDP per capita)	0.034 ∗∗∗ (0.009)	0.031 ∗∗∗ (0.010)	$p < 0.001$
ln(Tuition fees)	−0.012 ∗∗ (0.005)	−0.011 ∗∗ (0.005)	$p < 0.020$
University reputation (QS Top 1000 count)	0.673 ∗∗∗ (0.082)	0.664 ∗∗∗ (0.085)	$p < 0.001$
Student safety index	0.024 ∗∗ (0.010)	0.022 ∗ (0.011)	$p < 0.045$
Inflation (%)	−0.008 (0.007)	−0.007 (0.007)	$p < 0.290$
Constant	6.721 ∗∗∗ (0.412)	6.694 ∗∗∗ (0.430)	—
Within R^2	0.72	0.71	—
Observations	250	250	—
Countries	50	50	—

Standard errors, (SE); are given in parentheses. ∗∗∗ $p < 0.01$, ∗∗ $p < 0.05$, ∗ $p < 0.10$.
Fixed-effects models include country- and year-specific dummies estimated using heteroskedasticity-robust Driscoll-Kraay root mean squared errors (lag = 2). Random-effects models were estimated using country-specific root mean squared errors. Hausman test: χ^2 18.47, $p < 0.01$, confirming the preference for the finite element (FE) method. The results demonstrate consistency in the signs and magnitudes of the coefficients across all specifications, indicating the robustness of the model.

Appendix Table B

TABLE A2 Data, Variables and Sources (2019-2023).

Variable	Definition and Unit	Transform	Source (exact series)	Notes
International students (volume)	Number of inbound internationally mobile tertiary students (headcount)	ln	UNESCO UIS UIS.SB.SCED.TERT.INSTUD	Annual; some gaps for non-reporters
Mobility rate	Inbound mobile students/total tertiary (%)	—	UNESCO UIS UIS.SB.MOBRATE.TERT	Used in sensitivity analyses
Education exports (value)	Exports of education-related travel, BoP, current USD	ln	OECD EBOPS 2010 (Travel-Education)/IMF BoP	OECD coverage; non-OECD selective
GDP per capita	Constant 2015 USD	ln	World Bank WDI NY.GDP.PCAP.KD	—
Inflation	CPI, % yoy	$\ln(1+\pi/100)$	World Bank WDI FP.CPI.TOTL.ZG	Robustness: level %
Tuition fees (intl.)	Average annual tuition, public HEIs, bachelor/master (USD PPP where possible)	ln	OECD EAG Table B5; national HE regulators (non-OECD)	Interpolate single off-years only
Rankings (reputation)	Count of Top-1000 universities per country	$\ln(1+x)$	QS WUR 2020–2024; robustness adds THE and ARWU counts (z-avg)	Map 2020→ 2019/20 … 2024→ 2023/24
Safety index	Global Peace Index (reverse-coded so higher = safer)	z-score	IEP GPI 2019–2023	Robustness: Gallup Law and Order; WGI
Population (control)	Total population (millions)	ln	World Bank WDI SP.POP.TOTL	Optional control
English-language share (control)	% programs taught in English	—	National HE portals/StudyPortals	Sparse; robustness only