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Human Capital, Institutional Revenue, and University Prestige: The Role of International Students in the United States

Meghna Laha & Tiberio Garza
Florida International University

Corresponding author: Meghna Laha, 11200 SW 8th ST, Ziff Education Building, Miami, Florida 33199
Orchid ID: 0009-0008-4422-9356

ABSTRACT

This study examines the economic and institutional contributions of international students to U.S. higher education amid recent federal immigration policy changes. Using ordinary least squares regression and 2023–2024 data from major educational and economic sources, the study investigates (1) international students' per capita contributions to state GDP and institutional revenues, (2) their influence on university national rankings, and (3) the determinants of international student enrollment, including institutional rank, employment opportunities, acceptance rates, graduation rates, geographic accessibility, and state immigration flows. The results indicate that international students significantly increase state GDP and university revenues, contributing an average of \$39,181 per student, after controlling for acceptance and graduation rates. National university rankings, employment opportunities, and acceptance rates emerge as significant drivers of enrollment. However, restrictive immigration policies, including higher visa fees and sanctions, may reduce these benefits, thus threatening institutional diversity, financial sustainability, and U.S. competitiveness in global higher education.

Keywords: International Student, Immigration Policies, GDP growth, Institutional revenues, Diversity

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INTRODUCTION

The political and policy discourse surrounding international students in the U.S. has remained fluid and complex. For decades, international students have been viewed as vital contributors to the internationalization of U.S. higher education, institutional prestige, and financial sustainability. Scholars such as Pham (2018) and Weber et al. (2024) argue that international students significantly enhance national rankings and provide steady revenue streams that benefit higher education institutions. Similarly, Startz (2023) contends that international students play a crucial role in sustaining universities through both tuition payments and living expenditures, thereby meaningfully contributing to the broader U.S. economy. According to Beine et al. (2023), as reported by the National Bureau of Economic Research, international students increase the supply of skilled labor in the U.S. by approximately 0.23%—a figure particularly influenced by foreign master's graduates in STEM disciplines.

Furthermore, Roy (2025), writing on behalf of the Council on Foreign Relations, highlighted international students as key actors in innovation and startup development. Their economic contributions also include support for institutional financial aid for domestic students (Lundin, 2025; Shih, 2016). In tandem, Schmidt (2020) emphasized that increased institutional spending—driven in part by international student revenue—is often associated with improved graduation rates and greater investment in student services to foster academic success. This research closely follows the definition of international students made by Bista (2016) as “those who move to another country (the host country) for the purpose of pursuing tertiary or higher education. In the United States, this refers to individuals who are not U.S. citizens, permanent residents, or refugees. The status of an international student is temporary and ends when the individual completes their studies or changes immigration status.

Following a significant decline during the COVID-19 pandemic, the number of international students in U.S. higher education institutions experienced a marked recovery in 2019 (Open Doors, 2024). Unfortunately, this resurgence has not matched the growth trajectory of the previous decade. Despite the U.S. being one of the world’s leading destinations for international education, the country now faces trends of declining student immigration. Although this downturn has not yet reached critical levels, changing immigration policies—particularly recent measures such as a heightened fee on H-1 B visas—pose a potentially significant threat to the international student population and, consequently, to institutional

diversity, financial health, and innovation capacity. Previous records from NAFSA (2024) reported that in 2024 alone, international students contributed \$43.8 billion to the U.S. economy and supported 378,000 jobs, making them the second-largest contributors to GDP among education-related sectors. These gains, however, are vulnerable to being undermined by restrictive immigration measures, particularly those implemented during the Trump administration through visa rejections, and may negatively affect racial diversity, institutional growth, and the overall trajectory of the U.S. higher education sector (Reuters, 2025). The current study explores the importance of international students in three different ways, as mentioned below.

Contributions of students at the state and institute levels

One way to critically address the question of whether international students are a ‘benefit or burden’ is to assess the per capita benefits generated by international students. While organizations such as the NAFSA and the Open Doors platform have measured the economic contributions of international students in the U.S. on a broad scale, comprehensive academic research linking the total number of international students attending top institutions within each state directly to state-level GDP figures is lacking. Existing reports tend to focus on singular states rather than providing a multistate comparison. For instance, the American Immigration Council reported that international graduates contributed approximately \$1.4 billion to Ohio’s economy over three decades; however, existing reports are primarily descriptive focusing on total spending or employment impacts (American Immigration Council, 2025). This gap highlights the need for more granular empirical studies that examine the economic impact of international students at the state level, using institutions as units of analysis.

Additionally, the study explores how international students contributed to institutional revenues in 2024. Previous studies that have examined the relationship between international student enrollment at the undergraduate level and institutional revenue at U.S. public colleges (Cantwell, 2015) have reported that international students positively and significantly influence the enhancement of net tuition at the institutional level. In fact, Weber et al. (2024) criticized higher education institutions, stating that international students are often treated as ‘cash cows’ or revenue sources under neoliberal and marketized conditions, but this may vary across countries or institutions.

A more recent assessment of the range of contributions made by students has been missing in the literature. Insight into state- and institutional-level findings would substantiate the level of contribution made by students at both levels, especially in the wake of changes in norms and regulations for students in the U.S. Institutional-level analysis reveals the per capita contribution of students per institution; in other words, the marginal contribution of revenue made by students at the institutional level and state-level dynamics can also be captured with international-level student numbers at each state and the state GDP.

Association of U.S. News National Ranks of Universities and International Students

Furthermore, from a policy-making standpoint, evaluating the broader institutional impact of international student presence offers a more robust framework for informed decision-making. As shown in various studies, one of the most important performance indicators for both public and private universities is their national rankings. These rankings are widely interpreted as proxies for institutional reputation and academic excellence (Bhandari & Blumenthal, 2011; Robinson-Bryant, 2013; Hazelkorn, 2013; Saupiciute & Dretikiene, 2018). The relationship between institutional rankings and international student numbers may thus serve as an additional lens for assessing their impact on the growth and reputation of U.S. higher education institutions.

Relationship between International Student Enrollment and University-wide Variables

Although some reports from QS Intelligence (QS World University Rankings, 2024) indicate that international students tend to prioritize admissions at top-ranked universities, along with Times Higher Education (2024) including them in their ranking matrix dimensions, an empirical study informing the relationship between ranks and international student numbers has been lacking in the literature in the post-COVID-19 era; however, in the COVID-19 era, while some studies focused on the effect of COVID-19 on international students, such as Gao et al. (2024) and Mok et al. (2020), they did not directly model ranking effects on students.

This study explores the influence of international student enrollment and institutional rank using available 2024 data from various portals, such as NAFSA, Open Doors, and USNWR, with other variables. Relationships between the number of international students at U.S. national universities, which is indicative of international student enrollment, and notable independent variables such as national rank (USNWR, 2024), acceptance rate (Ke, 2022; Soysal, 2024), graduation rate (Schmidt, 2020), student jobs (ICEF, 2019), and controls such as statewide cost of living (Mazzarol et al. 2002), distance from international airports (Cattaneo et al., 2016), and overall immigration levels across U.S. states (Findlay, 2011) have been studied via OLS regressions. Acceptance and graduation rates are pull factors among international students as signals of program quality and affect international student enrollment (Schmidt, 2020; Soysal, 2024).

Research Objectives

This study explains the per capita or the marginal contribution of students at the state and institutional level, and conducts an empirical assessment to understand the economic impact of international students in the U.S. In addition, it can assist institutions in making informed decisions using a range of other

factors, such as national university rankings, student employment rates, university acceptance rates, and graduation rates.

Given this gap in the literature mentioned above, three different objectives have been pursued in this study: (1) determining the per capita contributions of students at the state and institutional levels; (2) determining the influence of international student presence (independent variable) on the national rankings of U.S. universities (dependent variable); and (3) determining the influence of national rank, acceptance rates, graduation rates, the cost of living, the distance of international airports, and statewise immigration levels (independent variables and controls) on international student enrollment (dependent variable).

The empirical findings suggest that international students positively contribute to state-level GDPs and institutional revenue. It also indicates a statistically significant and positive relationship between university national rank and international student enrollment.

These insights can provide valuable empirical support for policymakers seeking to ground immigration and education policy in data-driven evidence. Additionally, the study revealed that university graduation rates, jobs, and national ranks, which are indicators of university reputation and quality, are important for international student enrollment under research objective 3, potentially influencing international student enrollment. Thus, the results may be helpful for policymakers to consider such favorable findings for future framing of policies for international students amidst vulnerable times of policy change in the changing U.S. geopolitical scenario.

LITERATURE REVIEW

Historically, numerous scholars have examined the pivotal role of international students in the U.S. higher education landscape (Adnett, 2010; Babones, 2022; Chellaraj et al., 2008; Choudaha, 2017). Adnett (2010) reported that the substantial growth in international student enrollment in U.S. higher education institutions led to their emergence as a critical source of revenue for institutional stakeholders. This increase in inbound student enrollment was often facilitated by national policies that recognized the disproportionate benefits of educational trade flowing toward developed destination countries. These benefits were derived from the economic and intellectual capital international students brought with them, while the costs of education were largely borne by the host institutions and local infrastructures (Adnett, 2010). A review of the contributions made by international students is provided in the following section for better understanding.

Growth & Innovation

Several studies have provided insights into how international students have contributed academically and commercially to the growth of research and institutions. A significant academic contribution in this context comes from Chellaraj et al. (2008), who reported that a 10% increase in the number of

international graduate students was associated with a 4.5% increase in the number of patent applications, a 6.8% increase in the number of patent grants, and a 5% increase in the number of non-university patent grants. These findings underscore the critical link between high-skilled immigration (indicative of international student enrollment) and national innovation capacity (indicative of growth and advancement), reinforcing the argument that international students contribute directly to the intellectual and technological advancement of host countries.

Institutional Competitiveness

From a comparative perspective, Babones (2022) illustrated how Australian universities, like their U.S. counterparts, strategically increased international student enrollments to enhance institutional competitiveness and visibility in global university rankings, which is directly aligned with the findings that this research aims to accomplish. Babones' (2022) approach positioned international students not only as revenue generators but also as key agents in fulfilling broader institutional missions within an increasingly globalized academic marketplace.

Revenue Generation and Performance Benefits

In a time series study, Choudaha (2017) offered a historical segmentation of international student enrollment into three distinct phases between 1999 and 2017. The first phase, catalyzed by the events of September 11, 2001, was associated with enhanced research output and policy realignments that favor security and academic excellence. The second phase, shaped by the global financial crisis, witnessed innovation in terms of recruitment strategies and funding models. The third phase, influenced by significant geopolitical shifts—including European Union developments and U.S. presidential elections—fostered greater competition among both traditional (e.g., the U.S., U.K.) and emerging destination countries. This competition intensified the strategic importance of international students in relation to institutional revenue, student success, and employability outcomes.

Taken together, scholarly studies substantiate the argument that international students serve as a net benefit—rather than a burden—to the U.S. economy and higher education system. Their contributions, ranging from innovation and intellectual property generation to institutional sustainability and workforce development, position them as integral actors in the broader landscape of national growth and global academic influence.

Consequently, U.S. immigration policy allowed large-scale international student admissions in 2022/2023, as the total number of international students increased by 12% compared to the previous academic year, surpassing one million (Open Doors, 2023). In 2023/2024, foreign student enrollment reached an all-time high of nearly 1.126 million, including OPT, with an associated economic impact of \$43.8 billion in spending, as confirmed by ICEF Monitor (2024) and Forbes (2023).

President Trump's Policies in 2025: Implications for International Students

Recent policy shifts and visa restrictions during President Trump's 2025 administration, however, have significantly altered the experience of international students in the United States, affecting those enrolled in both elite and non-elite institutions and relaunching the question of benefit or burden. Unless motivated by purely political reasons, a series of executive actions led to the revocation of student visas for approximately 6,000 individuals in March 2025 (CNN, 2025) under a "catch and revoke" initiative, which targeted international students whose social media activity was allegedly linked to support for terrorist organizations or who were involved in serious offenses such as driving-related crimes (Roy, 2025). In many cases, students were advised against international travel, as they faced the risk of being barred from re-entry into the country.

Further restrictions were introduced through fixed-term visa durations for F-1 and J-1 visa holders, limitations on changing academic programs during the first year of study, and intensified surveillance of students' online activities (O'Neil, 2025). A particularly controversial decision by the Department of Homeland Security (DHS) involved revoking Harvard University's authorization to enroll international students on allegations that the institution was fostering violence and collaborating with the Chinese Communist Party (Roy, 2025). Such measures, directed toward globally prestigious universities, have raised concerns about violations of freedom of speech and have profoundly affected the morale and sense of security among international students.

Park et al. (2022) emphasized that presidential transitions, adverse political climates, and economic shocks—such as those experienced during the COVID-19 pandemic—can exacerbate mental health challenges and heighten perceptions of inequity among international student populations. The current policy environment reflects similar patterns, potentially undermining the U.S.'s long-standing role as a preferred destination for international education.

Policy Uncertainty and the Way Forward

In response to these developments, international student policy has become a subject of intense debate in Washington, D.C. While advocacy groups such as NAFSA (2025) have actively lobbied in support of international students, political divisions and competing economic interests within the federal government have created significant barriers to reform. In the past, Senator Chris Van Hollen actively urged Congress to withdraw new policies that threatened international students with deportation (Van Hollen & Warren, 2020). Senator Patty Murray, Representative Pramila Jayapal, and Representative Krishnamoorthy have spoken in favor of several initiatives for international students, while Senator Murky cosigned letters with other House Democrats that oppose policy changes that jeopardize international student status under ICE and the Department of Homeland Security guidance (Senator Edward Markey, 2020).

As a consequence, the policy implications have been damaging in multiple ways, including visa uncertainty and delays (Association of American Colleges & Universities, 2025; Economic Times, 2025; Times Higher Education, 2025),

visa cancellations and revocations (O'Neil, 2025), and the issuance of fixed-term visas coupled with ambiguity regarding visa status (O'Neil, 2025). The effects include declines in enrollment, reductions in the number of jobs supported by international students, and decreases in research output (American Immigration Council, 2025). The continuation of such deterrent policies in future years could contribute to the erosion of the U.S. advantage in higher education, as observed in 2025, despite empirical evidence demonstrating a positive association between international students and state GDP, institutional revenue, rankings, and enrollment (Laha & Garza, 2026).

The current situation, therefore, demands clearer, more predictable, and more stable guidance on visa processing timelines because volatility disrupts international student planning and reduces institutional attractiveness and student interest (Times Higher Education, 2025). Moreover, complex processing requirements and visa restrictions reduce institutions' incentives to recruit and retain students (American Immigration Council, 2025; NAFSA, 2025), despite evidence of the substantial economic benefits generated by international students.

This research hopes to contribute to the ongoing policy dialog by providing empirical evidence to assist policymakers, legislators, and federal agencies, particularly the Department of Homeland Security, in assessing the broader consequences of recent visa restrictions and targeted sanctions, given the documented contributions of international students.

Theoretical Framework

The literature review section describes the most eminent reasons for how international students contributed to the growth of institutional success, strategically enhanced enrollment, and increased revenues at the institutional level. In this section, we illustrate the theories that explain this immigration and enrollment movement.

A popularly constructed definition of an international student is “who is enrolled at an institution of higher education in the United States who is not a U.S. citizen, an immigrant (permanent resident), or a refugee” (Bista, 2016). This definition highlights the vulnerability of the status of international students holding F1 visa status in the U.S. without citizenship or a naturalization process during their education at U.S. universities. U.S. policymakers and the federal government treat them as external immigrants, and this remains a constant source of concern for international students during their study period, justifying the reason for this study.

The theoretical framework aims to explain the process of international students flowing to the United States and closely abides by an alternative definition of international students by Bista (2016), who stated, “A student who moves to another country (the host country) for the purpose of pursuing tertiary or higher education (e.g., college or university).” This movement of international students can be illustrated through globally persistent economic and demographic forces such as globalization theory, consumer demand theory, the theory of

capitalism, and other global effects that lead to the migration of international students to the United States.

Marginson (2007) reported that national ranks of universities, indicators of university excellence and competitiveness, play a monumental role in this immigration process by sending economic signals to institutions and students. The signals provide a push force for students to migrate to countries that offer the benefits of higher education, including research opportunities, increased funding, and expert faculty. Additionally, socioeconomic constraints in countries of origin often act as push factors, while strategies from destination countries, such as visa and work policies, attract international students to meet labor and revenue goals (Pham, 2018). Refer to Fig 1.

On the other hand, owing to the theory of capitalism, U.S. capitalistic market conditions seek to reap commercial benefits and enhance research output by attracting students (Smith, 1776). This contributes to a pull factor often generated by consumer demand, as simplified by Altbach (2004), where students behave as consumers and universities as firms. In addition, the theory of capitalism leads to a demonstration of push and pull forces induced by the inevitable influence of globalization theory (Knight, 2013). Refer to Fig 1.

What provides further insight is that the movement of students is particularly reinforced by brain drain and limited opportunities in home countries compared with destination countries, as shaped by differences in economic stability between nations (Docquier & Rapoport, 2012). Brain Drain (BD) theory contextualizes these patterns, highlighting both *ex ante* (increased educational investment due to migration prospects) and *ex post* (loss of human capital) effects among countries of origin (Beine et al., 2001). When the long-term loss of human capital outweighs the gains, the brain drain phenomenon dominates, leading to talent concentration in destination nations.

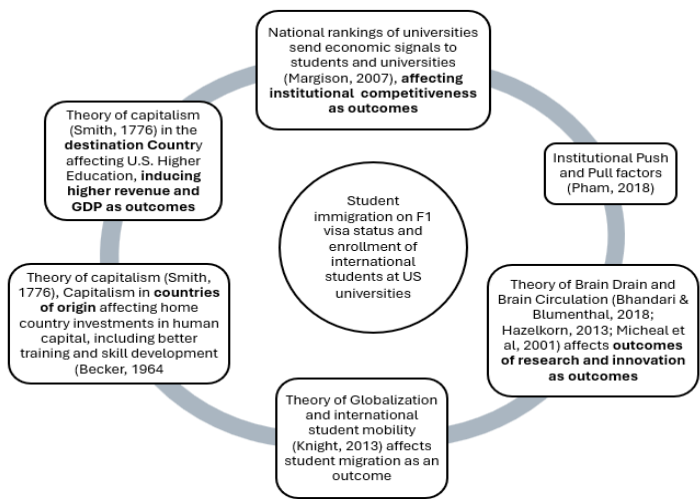
Prospects of higher earnings abroad drive students toward better economic prosperity in developed nations, thus contributing to economic growth in both their home and destination countries. Home countries may then respond with higher investments in human capital, including better training and skill development (Becker, 1964), to create a sustained cycle that links labor mobility and broader economic development and, in the process, influences student migration. Beyond brain drain, international student mobility is also linked to brain circulation, where talent movement benefits both origin and destination countries (Bhandari & Blumenthal, 2011). This demands the integration of the effects of globalization into rankings driven by economic reasons. The race to achieve institutional excellence on the demand side of students, represented by rankings, academic and research output, and other relevant indicators and metrics, intensifies cross-border movement among students (Hazelkorn, 2013), potentially contributing to brain circulation.

The complex interplay of the economic factors mentioned above is illustrated in Fig 1 below. The framework synthesizes globalization (Knight, 2013), university ranking signals (Marginson, 2007), push–pull migration factors (Pham, 2018), capitalism and human capital theory (Smith, 1776; Becker, 1964), and brain drain/brain circulation perspectives (Saxenian et al., 2001; Bhandari &

Blumenthal, 2011) to explain international student mobility to the United States. The framework intricately distinguishes antecedents (theories and causes) from consequences (outcomes) among all the theories. For the sake of comparison of immigration trends among the USA, Canada, and Australia, a brief table has been included in Appendix 1 (Table 1) for further illustration of how the USA still holds dominance in world higher education.

Fig 1

Depicts the complex interplay of economic theories affecting student migration and enrollment in the United States



The overall goal is to justify the importance of the economic theories discussed in this research study and their impact on the outcomes associated with those theories. Therefore, the stakes here are commercial gains for the U.S. state and institutions, including GDP and institutional revenue generated by international students. This is directly related to Objective 1, where the marginal contribution of students to the state and institutions can be assessed empirically in H1. Objective 2 assesses the effect of universities' national rankings on international students. Do ranks influence immigration and serve as a vital economic signal for international students as a 'pull factor'? For validation, the reverse-causality case is tested in H2 and H3. Finally, objective 3 analyzes how international student enrollment at U.S. institutions is affected by factors such as university national rankings, student employment, university acceptance rates, and graduation rates.

Research Hypothesis

Building upon a well-established body of literature that highlights the economic and academic contributions of international students to the U.S. (e.g., Chellaraj et al., 2008; NAFSA, 2024; Babones, 2022), this study provides data-driven insights that can inform future discussions among U.S. policymakers and legislators. Advocacy for international students should be rooted not only in rhetoric but also in demonstrable outcomes that reflect their broader societal and institutional impact. In this context, the study formulates the following hypotheses:

- **H1a:** The state-wise presence of international students positively influences state-level GDP.
- **H1b:** The institution-wise presence of international students positively influences institutional revenue.
- **H2:** The presence of international students at an institution positively influences the national rankings of U.S. universities.
- **H3:** International student enrollment on college campuses is positively influenced by national ranks of universities, student jobs, university acceptance rates, and graduation rates.

These hypotheses aim to capture the effects of international student enrollment on state GDPs and institutional standing on international student populations, thereby contributing to ongoing debates regarding the strategic value of internationalization in higher education policy. The relevance of this study is supported by the fact that neither international students nor their jobs are considered in the ranking matrices of USNWR (2024). Contextual relevance in the US is also justified, as the United States is the most popular destination country worldwide (Institute of International Education, 2025; Migration Policy Institute, 2025).

For Objective (1), it uses data from the U.S. Bureau of Economic Analysis (2025) on state-level GDP in the U.S., NAFSA (2024) on institutional revenues, and international student data from Open Doors (2024). For objective 2, we used data from the U.S. News & World Report, 2024 (USNWR), and Open Doors (2024) and employed ordinary least squares (OLS) regression to analyze whether the number of international students positively affects institutional rankings among reputed national universities. For objective 3, we use the same data sources as in objective 2, in addition to cost-of-life data (World Population Review, 2025), distance from international airports from Google Maps, and total immigration in states from the Migration Policy Institute (2025).

METHODS

Simple OLS regression was used in this study because the variables analyzed, primarily drawn from the latest USNWR ranking system (2024) and

Open Doors data (2024), are cardinal in nature and thus suitable for quantitative modeling. Although expanding the dataset to other years could have broadened the analysis, focusing on data from 2023–2024 more accurately captures the effects of recent post-COVID-19 changes in federal policies that shape international student trends. The restriction to a single year of data does not compromise the statistical validity of the sample, as a G*Power analysis confirmed that a minimum sample size of 34 achieves an alpha level of at least 0.05 and statistical power exceeding 90%, with a moderate-to-large effect size (0.5). Therefore, the sample size selected is substantively and statistically adequate for this research.

Pham (2018) analyzed variance (ANOVA) to examine differences among groups categorized by international student enrollment and net tuition rates between 2000 and 2018. Weber et al. (2024) applied a fixed effects model to investigate whether the proportion of international students is related to changes in public and private funding from 2008 to 2018. In contrast, the present study focuses exclusively on data from 2023–2024, emphasizing the post-COVID-19 period to capture the impact of recent federal policy changes on international students. Collecting longitudinal data on national university rankings from prior NAFSA years proved challenging because these records are typically maintained internally by institutions and updated regularly via public data portals. Given these limitations and the study's focus on contemporary policy effects, OLS regression was determined to be the most suitable method for analyzing the relationship between international student enrollment and institutional outcomes in the post-pandemic context.

Owing to the data being secondary, concerns about omitted variable bias were, however, present. However, the R-squared values of the regressions in the study were considerably high (> 0.8), suggesting that the independent variables successfully captured most of the variance in the model. The case of reverse causality between international students and national ranks is tested by H2 and H3. Additionally, the correlation between the independent variables used in the study was within the accepted levels (under 0.70), with one value showing a slightly higher number, -0.84 , between ranks (dependent variable) and the graduation rate (independent variable) in H3. Given that the conceptual distinction between the two variables is strong, we considered retaining the variables in the regression equation. A total of 51 states is considered in the first regression analysis for H1_a, 145 institutions for H1_b, and 139 for H2 and H3 in the third and fourth regressions. Although the USNWR lists approximately 417 universities, figures for the total number of international students were missing for several universities on the USNWR portal (USNWR, 2024), resulting in missing values. Instead, the use of data from Open Doors felt more appropriate, as it provided reliable data on international students from 200 universities, of which 144 universities matched the USNWR with available data on best national ranks, acceptance, and graduation rates but still had some missing values. Of the 144 matched observations, the regressions for H2 and H3 screened 139 observations without missing values.

The regression equations corresponding to each hypothesis are as follows:

H1_a: *State-level GDP* = $\beta_0 + \beta_1$ international student numbers + β_2 population + β_3 student flow migration + ε equation (1), $n = 51$

H1_b: *Institutional revenue* = $\beta_0 + \beta_1$ international student numbers + β_2 acceptance rates + β_3 graduation rates ε equation (1), $n = 139$

H₂: *National Ranks* = $\beta_0 + \beta_1$ international student numbers + β_2 jobs + β_3 acceptance rates + β_4 graduation rates + ε equation (2), $n = 139$

H₃: *International student numbers* = $\beta_0 + \beta_1$ national ranks + β_2 jobs + β_3 acceptance rates + β_4 graduation rates + β_5 statewide cost of living + β_6 distance from airports + β_7 total immigration in the states (logged) + ε equation (3), $n = 139$

Controls

Various scholarly publications have influenced the choice of control variables in the study. While independent variables such as jobs, acceptance rates, and graduation rates have been identified as key pull factors and proxies for international students in the U.S. for the selection or reputation of institutions, the choice of controls has been based on the practical cost considerations of living in the state (Mazzarol et al. 2002), traveling (Cattaneo et al., 2016), and statewide total immigration levels (Findlay, 2011). Here, the cost of living is a key deciding and intuitive factor for international students from various backgrounds and with varying levels of financial stability (Mazzarol et al. 2002). Geographic accessibility with airport connectivity as a proxy for travel has been found to influence the long-distance mobility of students and is therefore an appropriate choice of variable for international students who arrive in the U.S. from overseas locations (Cattaneo et al., 2016). Finally, international students commonly consider the existing migrant diaspora in states for support, ease of settlement, and networking while choosing their destinations for study, in addition to obvious considerations of the academic quality of institutions (Findlay, 2011).

The summary statistics of the tables are in Appendix 1 (Table 2).

FINDINGS

For H1_a and H1_b: Influence of international students on state-level GDP and institutional revenues

The findings of the regressions commonly elucidated some distinct observations. The coefficient value for international students is 0.0059 ($p=0.000$). The multicollinearity index for this model is 4.47, which is within the acceptable range of the multicollinearity test ($4.47 < 10$). The model demonstrates that international students are significantly and positively associated with state GDP.

A one-unit increase in international students is associated with a value of 0.597 billion USD, which is equivalent to 5.97 million. Additionally, a 1% population increase is approximately associated with a \$0.76 billion increase in population. Both of these parameters are strongly significantly associated with state-level GDP ($p = 0.000$). The student flow globalization parameter (sfg) is the degree to which a state's higher education system is connected to global student mobility networks, measured through the presence and intensity of international student inflows relative to the size of the state. This parameter is highly relevant to this analysis, as it reflects how student inflows and population contribute to the non-significance of the coefficient. The non-significance of the results indicates that relative internationalization is not a distinct driver of state-level GDP once absolute scale effects are accounted for. Economic output appears to be primarily associated with structural size (population) and absolute international student presence rather than intensity-based globalization measures. See Table 3.

Table 3: Influence of International students on state-level GDP for H1_a

State-level GDP from the U.S Bureau of Economic Analysis (Dependent variable)						
	Coefficient	Std. err	t	P > t	Confidence Interval	
International Students (Open Doors, 2024)	.0059659	.0013346	4.47	0.000	.003281	.0086507
Population	76.25942	4.653077	16.39	0.000	66.89863	85.6202
Student Flow	-4.603056	11.45634	-0.40	0.690	27.65023	18.44412
Globalization (sfg)*						
Constant	-70.42049	23.14452	-3.04	0.690	116.9812	23.14452

Model Specifications: N = 51, F (3, 47) = 706.16, Prob > F = 0.000, R-squared = 0.9783, Adj. R-squared = 0.9769;
Note: sfg* = international students by state/GDP by state*100

If SFG is insignificant after controlling absolute counts, that is a substantive result, not a scaling problem. This finding shows that the relative intensity of internationalization (SFG) has no independent explanatory power. However, the overall R-squared of the model (0.9783) indicates that the model captures most of the variance in the model and is therefore quite robust. The regression equation suggests that the association between GDP in billions of dollars and international students is significant and positive, *ceteris paribus*, clearly indicating that international students are a boon to the U.S. economy in 2024 in the post-COVID-19 era, considering all 51 U.S. states.

H1_b Results:

For H1_b, given the findings in Table 4, international student enrollment exhibited a positive and statistically significant relationship with institutional revenue ($\beta = 0.039$, $p < .001$). Holding acceptance rates and graduation rates constant, each additional international student was associated with an increase of approximately 0.039 units of institutional revenue. Given that institutional revenue was measured in millions of dollars, this translates to an estimated marginal contribution of approximately \$39,181 per international student. The 95% confidence interval suggests that the contribution ranges from approximately

\$36,290 to \$42,073 per student. This institutional-level outcome, in conjunction with the state-level benefits, clearly supports the view of Weber et al. (2024) of international students being ‘cash cows’ for U.S. universities. See Table 4.

Table 4: Influence of International students on UNWR national ranks of universities for H_{1b}

Revenue (NAFSA, 2024) Dependent variable						
	Coefficient	Std. err	T	P > t	Confidence Interval	
International Students	.0391814	.0014622	26.80	0.000	.0362896	.0420732
Acceptance rates	-76.98479	29.22445	-2.63	0.009	-134.7818	-19.18782
Graduation rates	78.89533	41.74674	1.89	0.061	-3.666873	161.4575
_const	5.633589	39.48851	0.14	0.887	-72.46254	-83.72972

Model specifications: N = 139, F (3, 135) = 420.90, Prob > F = 0.000, R-squared = 0.9034, Adj. R-squared = 0.9013

The multicollinearity estimate for the study was VIF = 2.15, which is well below acceptable standards. Compared with students, a one-percentage-point increase in the institutional acceptance rate is associated with a significant decrease in institutional revenue, leading to a decrease of approximately \$769,848 in institutional revenue. Furthermore, holding the other variables constant, a one-percentage-point increase in the graduation rate is associated with an estimated increase of approximately \$789,000 in institutional revenue. The p value is significant at the 1% level.

Institutional revenues in U.S. higher education are shaped primarily by market-based characteristics—particularly international student enrollment and institutional selectivity—while academic performance outcomes such as graduation rates do not independently drive revenue once market structure is accounted for.

For H2: Influence of international students on the national rankings of universities

At the institutional level, the results indicate that the national rankings of universities (dependent variable) are significantly influenced by the presence of on-campus international students, as shown in Table 5. Notably, the coefficient for this variable is negative (-32.48, $p = 0.000$), which reflects the ranking system’s structure—lower numerical ranks denote higher reputation. This suggests that a greater proportion of international students is often associated with higher-ranked institutions, typically elite or R1 universities. Consequently, there is a compelling need for targeted policy initiatives to enable R2 institutions to attract more international students to improve their rankings. Earlier, Andrade (2017) noted a decline in the U.S. share of the global international student market—from 28% to 22%—despite increases in absolute enrollment numbers, even in the pre-COVID-19 era. This decline was attributed to the absence of competitive policy incentives among low-ranked institutions, whereas proactive strategies employed by European countries such as Germany, the Netherlands, and Sweden seem to now attract higher proportions of students.

The regression model used in the analysis demonstrates strong explanatory power, with an R-squared value of 0.7820 and a *VIF* estimate of 2.42. Other independent variables, such as acceptance rates, have a positive and significant effect on national rankings. As per the statistical results, a 1-unit increase in the acceptance rate (0 to 1 scale) leads to a 64.86-point worsening in the rank score. Higher acceptance rates (less selective institutions) are associated with lower rankings (worse performance). This is consistent with USNWR logic, where selectivity strongly drives rankings. See Table 5.

Table 5: Influence of international students on the UNWR national ranks of universities for H₂

National ranks of nationally reputed universities (USNWR)					
Dependent Variable					
	Coefficient	Std. err	t	P > t	Confidence Interval
ln (students)	-32.4751	4.857159	-6.69	0.000	-42.08172 -22.86849
Student jobs	.0059929	.0032362	1.85	0.066	-.0004077 .0123935
Graduation rates	-301.5171	33.12385	-9.10	0.000	-367.0304 -236.0039
Acceptance rates	64.85743	23.66436	2.74	0.007	18.05345 111.6614
_const	513.3386	44.86559	11.44	0.000	424.6023 602.075

Model specifications: N = 139, F (4, 134) = 120.28, Prob > F = 0.000, R-squared = 0.7822, Adj. R-squared = 0.7757

Conversely, the graduation rate has a negative effect, as the coefficient is negative, implying that higher-ranked universities tend to graduate a greater proportion of their students than lower-ranked institutions do. Statistically, a one-unit increase in the graduation rate (i.e., from 0 to 1) is associated with a 301-point improvement in the rank score. The graduation rate is one of the strongest predictors of national ranking positions, as it is highly significant.

However, the association of student jobs, although weakly significant, appears to be debatable. While student jobs show a weakly significant association ($p = 0.06$ is significant at the 10% level), a one-unit increase in the acceptance rate (0 to 1 scale) leads to a 64.86-point worsening in the rank score. This reflects the reality that highly ranked universities often have other mechanisms (research, academic reputation, and resources) that attract students, perhaps independent of job availability. It is also indicative of the fact that overall, jobs may not strongly influence institutional prestige or attract students to top-ranked universities.

For H3: Influence of National ranks of universities on International Student Mobility

The results in Table 6 indicate that the model is statistically significant ($F(7,131) = 38.93, p < .001$), indicating that the set of predictors collectively explains the variation in international student enrollment. The model explains approximately 67.5% of the variance in international student enrollment ($R^2 = 0.6753$), whereas the adjusted R^2 of 0.6580 suggests that the explanatory power remains strong after accounting for the number of predictors.

Table 6: Influence of National Ranks of University on International Student Enrollment

International Student Mobility				
Dependent Variable				
Variables	Coefficient	Std. err	t	P > t
National ranks	-.0067533	0.0011	-6.25	0.000
Jobs	0.00026	0.0000	6.30	0.000
Acceptance rates	0.3442	0.3473	0.99	0.323
Graduation rates	-1.675	0.5826	-2.88	0.005
Cost of Living by State	-0.011	0.0033	-3.24	0.002
Distance from the airport	-0.0005	0.0006	-0.82	0.413
Immigration of foreign population by state	0.226	0.0541	4.19	0.000

Model specifications: N = 139, F (7, 131) = 38.93, Prob > F = 0.000, R-squared = 0.6753, Adj. R-squared = 0.6580

With respect to national ranks of universities, the dependent variable has a highly significant and negative relationship with international student enrollment. These findings suggest that national rank plays the role of a dominant pull factor for international students. International students use rankings as a signal of educational quality and labor market value when institutions are selected. This finding supports the conclusions of Marginson (2007) that rankings send economic signals to students to consider admission opportunities outside of the host country.

In the case of jobs, there is a positive and significant association with student jobs, making this variable another lucrative option for international students. A one-unit increase in the number of jobs is associated with an increase of approximately 0.00026 international students, holding all the other variables constant. Here, the findings of Krugman (1991) are also highlighted, with educational hubs being created by agglomeration effects at centers of higher prospects of economic gains.

The acceptance rate has a positive but statistically insignificant relationship with international student enrollment. Holding other factors constant, a one-unit increase in the acceptance rate is associated with approximately 0.34 additional international students, but the effect is not statistically distinguishable from zero.

Graduation rates are negatively and significantly associated with international student enrollment ($p < .05$). A one-unit increase in the graduation rate is associated with approximately 1.675 fewer international students, holding all the other variables constant. Although higher graduation rates are generally viewed as indicators of institutional effectiveness and contribute positively to national rankings, these results suggest that some institutions with lower international student enrollments may achieve stronger completion outcomes. Differences in institutional missions, student composition, and educational practices between R1 and R2 universities may influence this relationship. Consequently, these findings may reflect structural differences across institution types rather than a direct negative effect of graduation rates on international student enrollment.

The cost of living has a negative and statistically significant effect on international student enrollment. A one-unit increase in the cost-of-living index is associated with approximately 0.011 fewer international students, holding all the other factors constant. Essentially, this factor also serves as a significant pull factor for students from abroad. Conversely, distance from the airport is not statistically significant.

One significant finding is that the proportion or concentration of foreign-born residents in a state has a positive and statistically significant effect on international student enrollment. A one-unit increase in the immigration measure is associated with approximately 0.226 additional international students, holding all the other variables constant. In summary, we find that national rankings, job availability, cost of living, graduation rates, and state immigrant population significantly influence international student enrollment, whereas acceptance rates and airport accessibility do not significantly differ. Better-ranked universities attract significantly more international students, supporting the argument that institutional prestige remains a major determinant of international student mobility. Additionally, states with stronger labor markets and larger immigrant populations attract more international students, while higher living costs reduce enrollment.

DISCUSSION

Overall, the findings clearly suggest that international student and international student enrollment have increased in the U.S. economy in recent years, despite the recent growth of restrictive policies in the United States. As previous studies in the literature indicate, our findings clearly substantiate that international students increase revenue opportunities for institutions and, therefore, state-level GDP, as illustrated in H_{1a} and H_{1b} . They have also been key contributors to institutional reputation and the national ranks of universities. In fact, the relationship between ranks and international student enrollment is mutually enhancing and can be considered a case of dual causality (Granger, 1969). The relationship between international student numbers and graduation rates, although jobs are weakly significant. Thus, in the case of international student jobs, we find that they are not strong indicators of university reputation and may have other reputational indicators predicting positive changes in the national ranks of universities, according to H_2 . Conversely, they draw significantly more international students to university campuses, as justified by H_3 . These findings indicate that the prospect of jobs significantly drives international students to institutional campuses, as employment and career trajectories are vital considerations among international students. Finally, foreign immigration plays a vital role in streamlining students to some specific states more than others do. For example, NY, New Jersey, Pennsylvania, and California are some states that house large proportions of international students, and students are more likely to find networking channels, either family or friends, that encourage them to apply to universities in those states.

In addition to the OLS results, the overall descriptive analysis highlights the top ten countries of origin for international students in the U.S. on the basis of

2024 data from the U.S.N.W. These countries include India, China, Canada, Vietnam, South Korea, Mexico, Saudi Arabia, Brazil, Nigeria, and the United Kingdom (USNWR, 2024). In contrast, the Open Doors 2024 report featuring additional countries, such as Taiwan, Nepal, and Bangladesh, among the leading countries of international students. Universities that are actively recruiting seem to draw international students from popular source nations. Notably, students from South Asia, along with those from neighboring countries such as Mexico and Canada, continue to represent a significant share of international enrollments. Overall, the results indicate that international students make wide contributions and increase the potential for growth in the U.S. economy.

LIMITATIONS

Although the study sample is adequately powered, one limitation is the lack of data from other post-COVID-19 years, particularly 2021–2022. Recent changes in U.S. federal policies, combined with the lingering effects of the pandemic, have created a distinctive geopolitical environment that poses challenges to the sustainability of international student presence in the U.S. Future research could benefit from incorporating panel data analysis to capture temporal variations in student enrollment over multiple years. Such an approach would offer deeper insights into how federal regulations have influenced international student trends over time. Given that this study focuses on the implications of recent Federal Immigration policies and Department of Homeland Security policies for students residing and incoming to the U.S., the scope is intentionally confined to U.S. institutions. For such reasons, the findings may not apply to other nations or geographic regions. Additionally, students' perspectives on enrollment, jobs, and other factors, such as the influence of immigration, were not captured in the study.

Policy Implications

The results of the analysis of the three research objectives distinctly demonstrate that the contribution of international students has been substantial even since the COVID-19 pandemic. These results are quite encouraging despite the recent 19% decline in international student arrivals into the United States (NAFSA: Association of International Educators & JB International, 2025). ICEF Monitor (2023) records that more than 250,000 students were denied F1 study visas among international students, and the direct economic loss for these refusals has been estimated to be 7 billion USD. Given the per capita contributions to institutional revenues and state-level GDP from this study, it is possible that the U.S. would have to accept major setbacks at the economic level for reduced enrollment at universities and visa rejections (Georgetown University, 2026). Thus, the severity of the regulations seems to subvert employment and study opportunities in the U.S., with the potential to impact institutional revenues and the ranks of nationally reputed universities in the higher education space. With such regulations coupled with the denial of visas and work opportunities, students may eventually choose to migrate to other countries that compete closely with the U.S. as possible destinations for higher education.

To mitigate these impacts, policymakers may streamline visa processes and relax OPT and H-1B visa regulations to foster international student retention (Nash, 2024). Given that more than half of international students pursue STEM disciplines, promoting flexible work opportunities and workforce development strategies at universities is critical (NAFSA, 2024). (Nash 2024). Since the inflow of international immigrants and students is influenced by broader country-level disparities in income, work opportunities, quality of life and demographic changes (Choudaha, 2017; Nilsson et al. 2016), it may be advisable to ensure the smooth entry of students in the U.S. and broaden workforce development strategies at universities, such as training in STEM-related disciplines (NAS, 2024). Stricter economic and immigration policies compel students to consider alternative destinations and shift the boon of returns to other parts of the world.

In addition, as an alternative to H1B, other visa options that promote combined packages of work-and-stay can be considered with restrictions on periods of stay, perhaps 15 years covering 5 years of study and 10 years of work. This could provide adequate opportunities for student immigrants and help them complete their career goals while ensuring that they return to their host countries after the completion of their period of stay. Some selected candidates may also be allowed to transition selectively to green card opportunities on the basis of their merit in the long term (Dellon, 2025).

Recent policy discussions at the NAFSA Advocacy Event (NAFSA Advocacy Day 2025) focused on the equity and access challenges of international students. Following their agenda, representatives at the event were urged to promote balanced recruitment by encouraging need-based scholarships, regionally diverse recruitment efforts, and institutional commitments to global equity. The compelling need for the U.S. to reconsider such changes is driven primarily by the shortage of skilled talent in the United States, ensuring growth in innovation and revenue. One of the ways economic and performance objectives can be safeguarded at U.S. institutions is by securing the future of global talent in the U.S. This lies central to the thought of cross-country immigration strategies among international students.

Consequently, the current immigration trends of students compel governments to consider a coherent international education that aligns immigration, education, and labor policies with international competitiveness goals, as envisioned by the NAFSA approximately two decades ago (NAFSA 2006). A supportive and stable policy environment can not only increase the morale of international students but also strengthen the global competitiveness of U.S. higher education institutions. Ensuring such stability safeguards the substantial economic contributions that international students make to both state and national GDP. Moreover, it helps preserve the United States' long-standing reputation as a global leader in higher education. It is therefore essential that the U.S. political climate remains conducive and impartial with respect to study and employment opportunities for international students.

Appendix 1

Table 1: International Student Migration Trends: United States, Canada, and Australia (2020–2025)

Year	United States*	Canada (Study Permit Holders)	Australia (Onshore Overseas Higher Ed Students)
2020	~914,000	256,740	Severe pandemic decline
2021	~949,000	445,776	Border restrictions continue
2022	~1.06 million	550,187	327,547
2023	~1.13 million	682,889	409,249
2024	~1.13 million+	516,275	481,851
2025	Early signs of decline in new enrollments	Continued decline due to caps	Growth is slowing due to policy restrictions

Table 2: Descriptive statistics of all the variables

Variable	Obs.	Mean	Std. Dev.	Min	Max	Source	Measurement
International students	147	4237.088	4622.064	12	27247	Open Doors (2024)	Count
International Students (log transformed)	147	7.759	1.230	2.48	10.21	Open Doors (2024)	Percentage
National Ranks	147	137.612	110.087	1	392	USNWR (2024)	Rank positions
Revenue from International Students	145	171.334	205.017	2.8	1,400	NAFSA (2024)	\$ Million
Jobs Supported (jobs)	145	1,690.124	2,077.768	26	13,065	NAFSA (2024)	Count
Acceptance Rate (acc)	144	0.582	0.300	0.03	0.99	NAFSA (2024)	Percentage
Graduation Rate (grad)	146	0.570	0.193	0.09	0.93	NAFSA (2024)	Percentage
Cost of Living Index (col)	143	104.380	18.349	86.0	185.5	(World Population Review, 2025)	Percentage
Distance (di)	145	73.963	101.272	1.2	563.8	Google	Miles
Immigrant Population (imm)	147	1,757,148	4,268,260	25,100	45,000,000	U.S. Bureau of Economic Analysis	Count
Log Immigrant Population (ln_imm)	147	13.332	1.397	10.13	17.62	U.S. Bureau of Economic Analysis	Percentage
State GDP,	51	580.588	743.174	45	4,100	U.S. Bureau of Economic Analysis	\$ Billion
State Population, Millions (pop)	51	6.602	7.514	0.6	39.1	U.S. Census Bureau	\$ Million
Student Flow Globalization (SFG)	51	3.880	1.947	0.6	9.5	Computed*	Percentage

Kindly note: sfg* = international students by state/GDP by state*100

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Bios

Meghna Laha is a graduate candidate at the Department of Higher Education Policy, CASE, Florida International University. Her research interests are in National Rankings of US Universities, the competitiveness of ranks, factors affecting the competitiveness of US institutions, policy making, DEI, immigration, and international student enrollment factors. Email: mlaha001@fiu.edu

Dr. Tiberio Garza is an Associate Professor and Department Chair in the School of Education and Human Development at Florida International University, where he directs the Evaluation Research Lab and leads numerous grant-funded projects in educational evaluation. His research interests are in quantitative and mixed-methods research, applied statistics, programs and policy evaluation in education, and student success and retention in higher education. Email: tgarza@fiu.edu