

**THE IMPORTANCE OF IMMIGRANTS AND
INTERNATIONAL STUDENTS TO HIGHER
EDUCATION IN AMERICA**

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EXECUTIVE SUMMARY

Without immigrants, international students and the children of immigrants, the undergraduate student population in America would be almost 5 million students smaller in 2037 than 2022, or about two-thirds of its current size, while the graduate student population would be at least 1.1 million students smaller, or only about 60% of its current size. Losing up to one-third of undergraduate enrollment and almost two-fifths of graduate enrollment would be catastrophic for many colleges and universities, especially those in parts of the United States already experiencing demographic declines. It would likely lead to many colleges and universities closing, resulting in fewer educational opportunities for U.S. students, fewer higher education-related jobs in many states and towns and fewer college-educated workers in the United States.

U.S. colleges and universities face a looming demographic cliff. Due to the post-2007 drop in birth rates, the number of U.S.-born traditional college-age young adults is expected to start dropping in 2025. Projections indicate that the U.S.-born college-going population could fall by 15% between 2025 and 2029 alone. Total enrollment at U.S. higher education institutions peaked in 2010-11 and then declined, and the share of U.S. young adults enrolled in college has dropped. Immigrants, international students and the children of immigrants can make a significant difference in the fate of U.S. colleges and universities, jobs connected to those institutions, educational offerings for U.S. students and whether America's college-educated workforce grows.

The estimates in this report are based on Current Population Survey and National Center for Education Statistics data and reflect the growing share of students at U.S. colleges and universities who are international students, immigrants, or the children of immigrants.

Those estimates include the following components:

- If international students no longer came to the United States, total undergraduate student enrollment would be at least 2% smaller and graduate student enrollment at least 11% smaller over 2025-2037.
- If all new immigrant inflows ceased, including international students, those drops would be about 1 to 2% bigger.
- If all immigrants currently living in the United States were to leave, undergraduate student enrollment would fall by another 6.6% and graduate student enrollment by about 12%.
- And if the children of immigrants current living in the United States did not attend U.S. colleges or universities, undergraduate student enrollment would plummet by almost 23% and graduate student enrollment by about 16% over 2025-2037.

This report uses multiple data sources to present a comprehensive picture of the importance of international students to U.S. higher education, including:

- U.S. higher education institutions enrolled over 880,000 international students in 2023-24, according to data from the Institute of International Education (IIE). Although that number represents a 36% increase since 2010-11, international student enrollment is 2% below its high, reached in 2016-17. International student enrollments fell during the first Trump administration, then plummeted during the pandemic, and have rebounded but not yet fully recovered.
- The number of international students enrolled in bachelor's degree programs in 2023-24 was 4% below its 2020-21 level and 18% below its peak in 2017-18, according to IIE data. International students in master's degree programs were well above pre-pandemic levels, in contrast, at more than 30% higher than in 2016-17. International students in PhD and professional programs have tended to increase steadily over time, with a small dip during the pandemic.
- International students as a share of all students have plateaued at the undergraduate level but risen markedly at the graduate level in the post-pandemic period. The share of undergraduate students who are nonresidents has hovered around 3% since 2020-21, down from 3.4% before the pandemic, according to data from the U.S. Department of Education, National Center for Education Statistics (NCES). International students as a share of graduate students have surged after the pandemic, reaching over 16% in 2022-23.
- About 5% of all bachelor's degrees are awarded to international students, and about 8% of bachelor's degrees in STEM majors, according to NCES data. In 2021-22, the most recent year of NCES data currently available, 13% of all master's degrees and 36% of STEM master's degrees were awarded to international students. About 12% of all PhDs were awarded to international students, and 46% of STEM PhDs.

The number and share of immigrant-origin students in higher education has been rising over time. Original analysis of data from the Current Population Survey, conducted by the U.S. Census Bureau and the Bureau of Labor Statistics, in this report shows:

- The share of undergraduate students who are 1st generation immigrants – students who were not U.S. citizens at birth and are either international students or foreign-born U.S. residents – rose from 9% in 2010 to 11% in 2022. The share of undergraduates who are 2nd generation immigrants – U.S.-born children of immigrants – rose from 15% to 24% over that period. In 2022, the 3rd+ generation accounted for only two-thirds of undergraduate students and was 3.7 million below its 2010 level. Absent the growth in the number of immigrant-origin students, the number of undergraduate students would have fallen by almost 4.6 million between 2010 and 2022.

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- In 2022, 1st generation immigrants accounted for 26% of graduate students, up from 20% in 2010. The 2nd generation accounted for 15% of graduate students in 2022, up from 11% in 2010. Growth in the number of immigrant-origin students pursuing graduate degrees accounts for all of the growth in graduate students between 2010 and 2022. The number of 3rd+ generation students in graduate school fell by over 160,000 between 2010 and 2022. Absent the growth in immigrant-origin students, the number of graduate students would have fallen by almost 570,000 between 2010 and 2022.

International students have a substantial positive impact on U.S. higher education. As public funding for universities falls, public universities tend to increase their number of international students. Doing so enables them to maintain or even reduce in-state students' tuition and fees. Master's programs typically cross-subsidize programs at other levels.

International students do not crowd out U.S. students and may even increase their numbers. The higher tuition paid by international students can enable public universities to increase their offerings. For each additional international undergraduate student that public universities enroll, their in-state freshman enrollment increases by two, on average. Each additional 10 bachelor's degrees awarded to international students at a college or university is associated with 15 more bachelor's degrees in STEM majors being awarded to domestic students. In STEM fields, each additional PhD awarded to an international student in a STEM field is associated with an additional PhD awarded to a domestic student. Across all fields, an additional 10 international graduate students at a university increases the number of domestic graduate students by three.

International students who remain in the country make valuable contributions to the U.S. economy, including spurring entrepreneurship and innovation. Master's programs with more foreign students result in more businesses being created by graduates of those programs. Higher education is the main entry channel for immigrants who have become entrepreneurs – 75% of immigrants who have founded U.S. companies that received venture capital funding attended a U.S. college or university. International graduate students boost U.S. innovation, as measured by patents and publications.

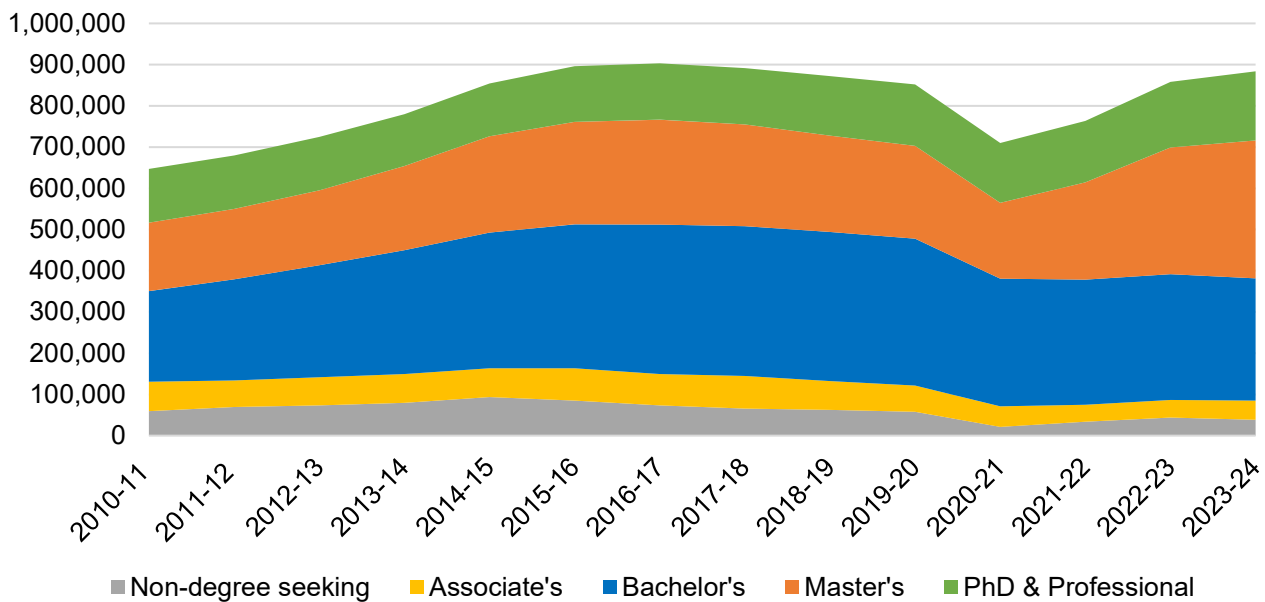
International students are an important source of workers, particularly in the high-tech sector. About 23% of international students who earn a master's degree remain in the United States after graduation to work in the same state as the university they attended, and about 8% of bachelor's degree recipients. The drop in international students during the pandemic likely reduced the number of foreign-born graduates with STEM degrees from U.S. colleges and universities working in the country by 30,000 to 60,000 workers.

TRENDS IN INTERNATIONAL STUDENT ENROLLMENT

Having a robust higher education system is critical to future innovation and economic growth. However, worrisome trends have emerged ahead of a looming demographic cliff for U.S. colleges and universities. Total enrollment at U.S. higher education institutions peaked in 2010-11 and then steadily declined for over a decade.¹ The share of U.S. young adults enrolled in college has also been falling.² Reflecting the post-2007 drop in birth rates, the number of U.S.-born traditional college-age young adults is expected to begin to drop precipitously in 2025. Projections indicate that the U.S.-born college-going population could fall by 15% between 2025 and 2029 alone.³

Faced with these troubling statistics, U.S. colleges and universities have increasingly turned to international students to help fill seats and provide much-needed revenue. Data from the Institute of International Education’s (IIE) Open Doors Report indicate that U.S. higher education institutions enrolled over 880,000 international students in 2023-24, an increase of more than 230,000 students, or 36%, since 2010-11 (Figure 1). Over a longer timeframe, the number of international students has almost tripled since 1980, according to IIE data.

Figure 1. International students enrolled at U.S. higher education institutions, by academic level



Note: Data from Institute of International Education (2024), “International Students by Detailed Academic Level, 1990/00-2023/24,” Open Doors Report on International Educational Exchange, <https://opendoorsdata.org/>. Master’s includes graduate degree, unspecified. The figure does not include international students doing Optional Practical Training (OPT).

¹ See https://nces.ed.gov/programs/digest/d23/tables/dt23_303.10.asp.

² See https://nces.ed.gov/programs/digest/d23/tables/dt23_302.60.asp.

³ See Nathan D. Grawe, *Demographics and the Demand for Higher Education* (Johns Hopkins University Press, 2018).

Although the number of international students enrolled at U.S. colleges and universities is higher than it was a decade or more ago, it is below its peak, which occurred in 2016-17, according to IIE data. Enrollment of international students declined throughout the first Trump administration and then fell precipitously in 2020-21 during the Covid pandemic. The post-pandemic recovery in total enrollment by international students has been robust, with enrollment up 25% between 2020-21 and 2023-24, but total enrollment was still 2% below its 2016-17 level.

The recovery has been uneven across academic levels. The number of international students enrolled in bachelor's degree programs in 2023-24 was 4% below its 2020-21 level and 18% below its peak in 2017-18. Enrollment at the bachelor's degree level is important since that level typically accounts for the greatest number of international students, as Figure 1 shows. The numbers of international students in associate's degree programs and non-degree-seeking programs are considerably smaller than the number in bachelor's degree programs, but trends in those programs can augur trends in other programs since associate's and non-degree programs – many of which are English-language instruction – help prepare international students for other programs. Schools that provide associate's degrees and non-degree programs are also a significant component of the higher education sector. In 2023-24, enrollment of international students in associate's degree programs was over 40% below its pre-pandemic peak, and over 60% below in non-degree-seeking programs.

Meanwhile, enrollment in master's degree programs has risen at a brisk pace in the post-pandemic period after falling during the first Trump administration. In 2023-24, the number of international students enrolled in master's degree programs exceeded the number enrolled in bachelor's degree programs for the first time, according to IIE data.⁴ International enrollment in master's programs in 2023-24 was over 30% above the pre-pandemic high reached in 2016-17. The number of international students enrolled in PhD and professional programs (such as law schools and other specialized graduate school programs) has risen fairly smoothly over time, with a slowdown during the early years of the first Trump administration and then a small drop during the pandemic. In 2023-24, international enrollment in PhD and professional program was about 13% above its pre-pandemic high.

In addition to the enrolled students shown in Figure 1, IIE data indicate strong growth in the number of international students doing post-graduation Optional Practical Training (OPT) in recent years.⁵ OPT allows international students to work in the United States for 12 months after graduation in a job related to their studies, and for an

⁴ Data from the Department of Homeland Security (DHS), U.S. Immigration and Customs Enforcement, Student and Visitor Exchange Program's Student and Exchange Visitor Information System (SEVIS) by the Numbers reports indicate that the number of international students in master's programs first exceeded the number in bachelor's programs in calendar year 2022. IIE Open Doors Reports are based on State Department data, not DHS data. The number of master's degrees awarded to international students has long exceeded the number of bachelor's degrees awarded to international students since the former typically take one or two years to complete, versus four for a conventional bachelor's degree program.

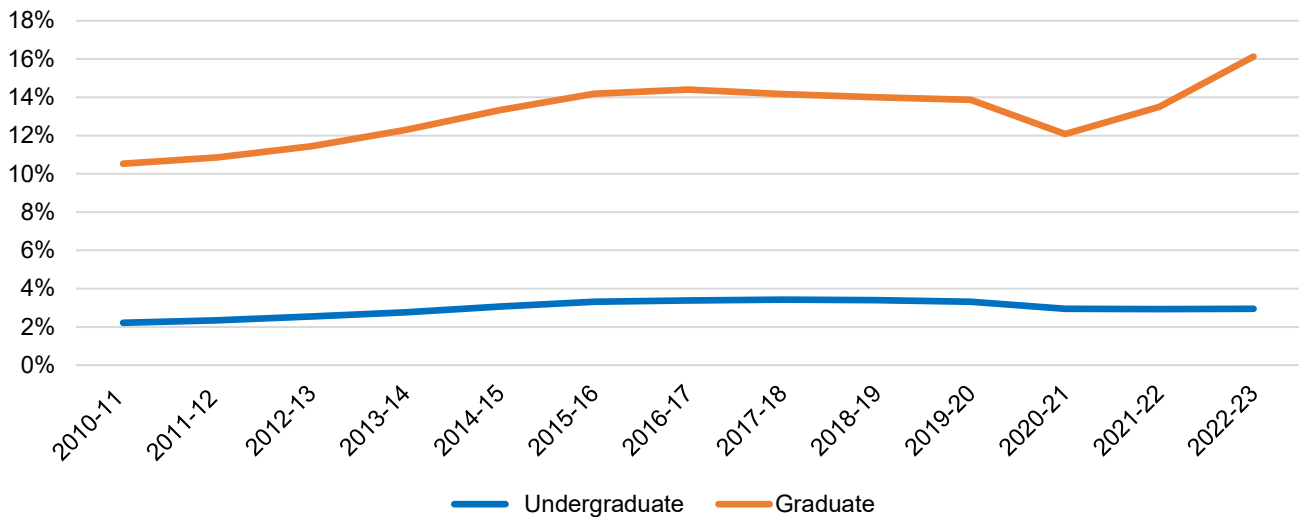
⁵ See <https://opendoorsdata.org/data/international-students/academic-level/>.

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additional 24 months if they completed a degree in a science, technology, engineering, or mathematical (STEM) field. Over 242,000 international students were doing OPT during 2023-24, versus fewer than 41,000 in 2006-07, according to IIE data. The number of international students doing OPT rose considerably after the 12-month work period was extended by 17 months for STEM majors in 2008, additional STEM majors were added in 2012, and the STEM extension was further increased to the current 24 months in 2016.⁶

International students as a share of all students have plateaued at the undergraduate level but risen markedly at the graduate level in the post-pandemic period. Data from the U.S. Department of Education, National Center for Education Statistics (NCES) indicate that the share of undergraduate students who are nonresidents – which includes international students present in the country on a student visa as well as some undocumented students – has hovered around 3% since 2020-21 (Figure 2). Before the pandemic, international students as a share of undergraduate students were slightly higher at 3.4%. The share of graduate students – students in master's, PhD, and professional programs – who are nonresidents has surged after the pandemic, reaching over 16% in 2022-23 (the most recent year of data available from the NCES).

Figure 2. International students as a share of undergraduate and graduate students

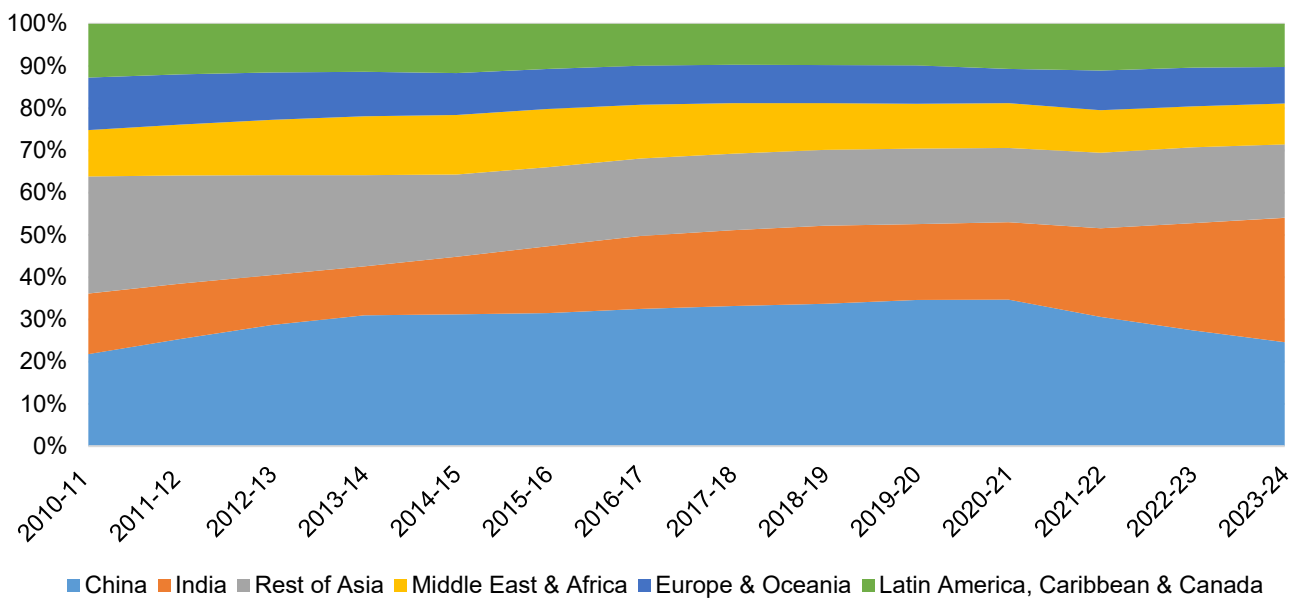


Note: Data are from U.S. Department of Education, National Center for Education Statistics (various years), "Digest of Education Statistics," <https://nces.ed.gov/programs/digest/>.

⁶ For more on OPT, see Stuart Anderson, "International Students and STEM OPT," National Foundation for American Policy policy brief (2017), <https://nfap.com/studies/international-students-and-stem-opt/>; Madeline Zavodny, "International Students, STEM OPT and the U.S. STEM Workforce," National Foundation for American Policy policy brief (2019), <https://nfap.com/studies/international-students-stem-opt-and-the-u-s-stem-workforce/>.

The origins of international students have shifted in recent years, particularly in the post-pandemic period. India overtook China as the largest source country in 2023-24, according to IIE data (Figure 3). India accounted for almost 30% of international students that year, and China for 25%. No other country comes remotely close to India or China in terms of international students coming to the United States – fewer students come from the rest of Asia combined than from either India or China. The Middle East and Africa, Europe and Oceania, and Latin America, the Caribbean and Canada send even fewer international students to the United States.

Figure 3. Distribution of international students across major origin countries and regions



Note: Data from Institute of International Education (2024), “International Students by Place of Origin, Selected Years, 1949/50 - 2023/24,” Open Doors Report on International Educational Exchange, <https://opendoorsdata.org/>.

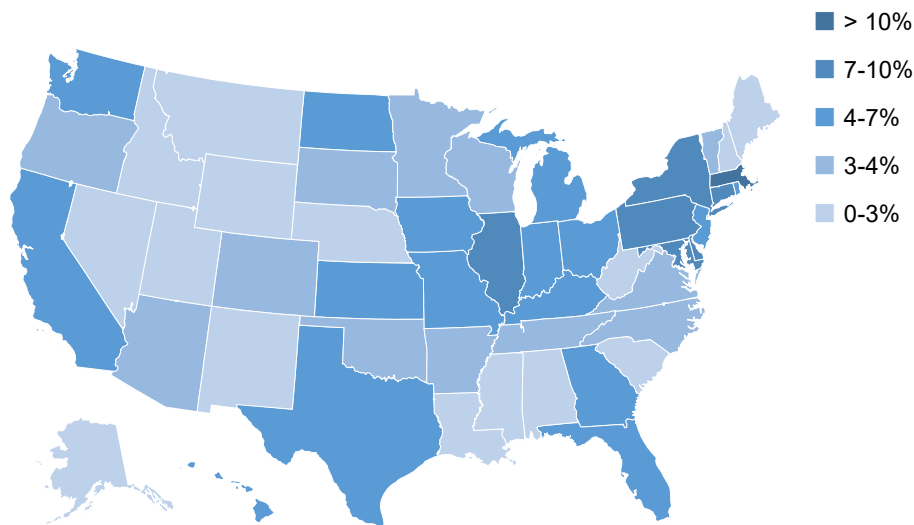
The typical trajectory of international students from developing countries is that initial flows are primarily at the doctoral level since PhD students usually receive funding from their universities. Master’s and undergraduate students then follow as countries’ economies develop further and more families can afford to pay tuition and other fees. China followed this pattern, and India appears to be following it as well.⁷ The quantity and quality of higher education available in developing countries usually lags behind increases in student demand for higher education as countries develop, but capacity and quality tend to increase over time and student outflows eventually slow. That

⁷ See John Bound et al., “The Globalization of Postsecondary Education: The Role of International Students in the US Higher Education System,” *Journal of Economic Perspectives* 35 (2021): 163-184, <https://doi.org/10.1257/jep.35.1.163>.

may now be happening with China, where the quality of the top universities has risen markedly in recent years and capacity has increased as well.⁸

The share of international students varies considerably across states (Figure 4). Massachusetts has the highest share of enrollment composed of international students at 14%. New York and the District of Columbia come in next at just below 10%. States with relatively high foreign-born population shares, such as California, Texas, and Illinois, tend to have relatively high shares of international students as well. Networks and geography may play a role, but the pattern is also consistent with international students who opt to stay in the country after graduation tending to remain near their college or university. Indeed, colleges and universities play an important role in local economies by attracting and retaining international students to their geographic area.⁹

Figure 4. International students as a share of college and university enrollment, by state



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Note: Based on data for Fall 2022 from U.S. Department of Education, National Center for Education Statistics (2024), "Digest of Education Statistics," <https://nces.ed.gov/programs/digest/>.

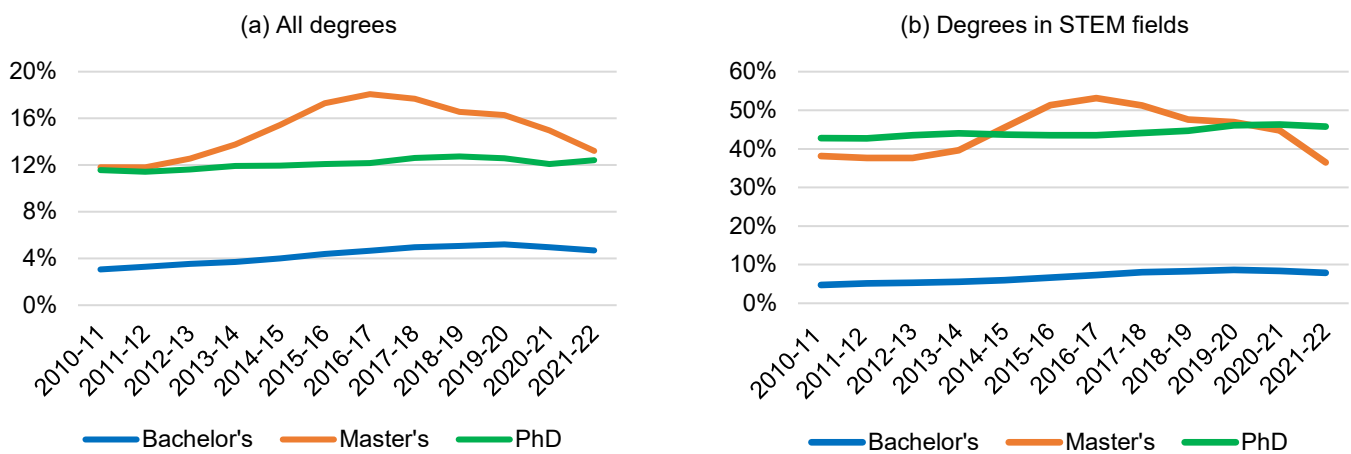
⁸ See, for example, the Times Higher Education world university rankings at <https://www.timeshighereducation.com/world-university-rankings>, and Bound et al. (2021), op cit.

⁹ Michel Beine, Giovanni Peri, and Morgan Raux, "International College Students' Impact on the US Skilled Labor Supply," *Journal of Public Economics* 223 (2023): 104917, <https://doi.org/10.1016/j.jpubeco.2023.104917>.

TRENDS IN DEGREES AWARDED TO INTERNATIONAL STUDENTS

The share of bachelor’s degrees awarded by U.S. colleges and universities to international students was trending upwards until 2019-20 and then decreased slightly (Figure 5). About 5% of bachelor’s degrees have been awarded to international students in recent years, according to data published by the NCES. In STEM majors, the pattern over time is similar, but the share is slightly higher at about 8% of bachelor’s degrees.

Figure 5. Share of degrees awarded to international students, by academic level



Note: Based on data from U.S. Department of Education, National Center for Education Statistics (2024), "Digest of Education Statistics," <https://nces.ed.gov/programs/digest/>.

The share of master’s degrees awarded to international students fluctuates more since those programs are shorter. The share of all master’s degrees awarded to international students peaked at 18% in 2016-17, and at 53% of master’s degrees in STEM fields that year. In 2021-22, the most recent year available, only 13% of all master’s degrees and 36% of STEM master’s degrees were awarded to international students.

The share of PhDs awarded to international students has remained fairly steady at around 12% in recent years, while the share of STEM PhDs has fluctuated between 43% and 46%. There is considerable variation in the share of PhDs awarded to international students across STEM fields. In 2021-22, about 24% of PhDs in biological and biomedical sciences were awarded to international students, 42% of PhDs in physical sciences, 56% of PhDs in mathematics and statistics, and almost 60% of PhDs in computer and information sciences and in engineering, according to NCES data.

The share of professional degrees awarded to international students is considerably lower than the share of other post-baccalaureate degrees. In 2017-18, the most recent year of data available from the NCES about professional degrees by race/ethnicity, only 1.3% of medical (M.D. and D.O.) degrees were awarded to nonresidents, and 2.8% of pharmacy (Pharm.D.) degrees. Nonresidents accounted for 3.5% of students awarded a law degree.

TRENDS IN FOREIGN-BORN STUDENTS AND THE CHILDREN OF IMMIGRANTS

The above data on enrollments and degrees are based on international, or nonresident, students. Those students are typically present in the United States on a student visa, although some unauthorized immigrants may be included in the data. But colleges and universities also enroll, educate and award degrees to foreign-born students who moved to the United States before they started their higher education. Some of those students have a temporary visa as a dependent, while others have a permanent resident visa, have become naturalized citizens, or lack legal status. Those foreign-born students and the children of immigrants – together, immigrant-origin students – are also important to U.S. higher education. (Someone is a child of immigrants if at least one of their parents was born outside of the United States.)

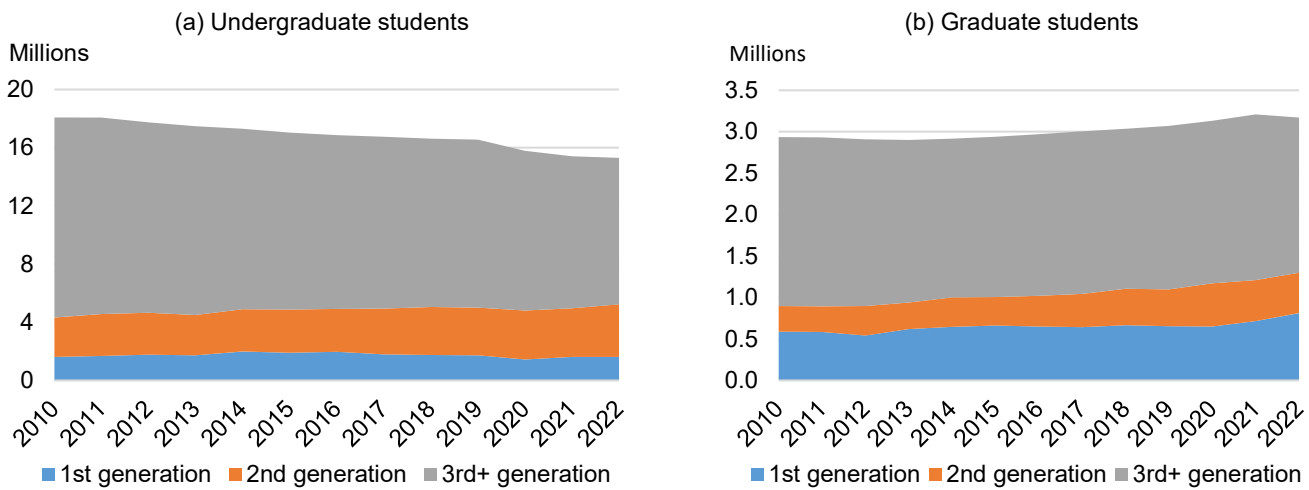
To investigate the number of immigrant-origin students at U.S. colleges and universities, this study uses data from the Current Population Survey (CPS). The CPS is a monthly survey of the U.S. civilian, noninstitutional population conducted by the U.S. Census Bureau and the U.S. Bureau of Labor Statistics (BLS) that is the basis for many of the employment statistics published by the BLS. Every month, the survey asks about 55,000 households about their demographic characteristics and labor market behavior. Every October, the CPS includes a supplement that asks additional questions about school enrollment, including in what level of school students are currently enrolled. This report uses the data from the 2010-2022 October CPS supplements and distinguishes between students enrolled in college (undergraduate) and in graduate school.¹⁰ Students are classified here as 1st generation immigrants if they were not U.S. citizens at birth, as 2nd generation immigrants if they were U.S. citizens at birth but one or both of their parents were born abroad, and as 3rd+ generation if they were U.S. citizens at birth and both of their parents were born in the United States.

The number and share of students in higher education who are 1st or 2nd generation immigrants has been rising over time (Figure 6). The share of undergraduate students who are 1st generation immigrants – a group that includes international students, students on other visas, naturalized citizens, and unauthorized immigrants – rose from 9% in 2010 to 11% in 2022, totaling about 1.6 million undergraduates that year. The share of undergraduates who are

¹⁰ The CPS data are available from IPUMS at <https://cps.ipums.org/cps/>. The CPS data are reweighted to sum to the total number of enrolled students by level of student and race/ethnicity as reported by NCES. Since the CPS surveys the noninstitutional population, the CPS data do not include students who live in dorms. The reweighting helps correct for this.

2nd generation immigrants rose from 15% to 24% over that period, accounting for about 3.6 million undergraduates in 2022. The increases reflect the growth in the immigrant population and the rising share of children born in the United States with at least one foreign-born parent. In 2022, the 3rd+ generation accounted for only two-thirds of undergraduate students. The number of 3rd+ generation undergraduate students fell by almost 3.7 million between 2010 and 2022, while the combined number of 1st and 2nd generation undergraduate students rose by over 900,000 during that period. Absent the growth in immigrant-origin students, the number of undergraduate students in 2022 would have been 4.6 million smaller than in 2010, assuming that enrollment rates did not change.

Figure 6. Immigrant-origin students, by academic level



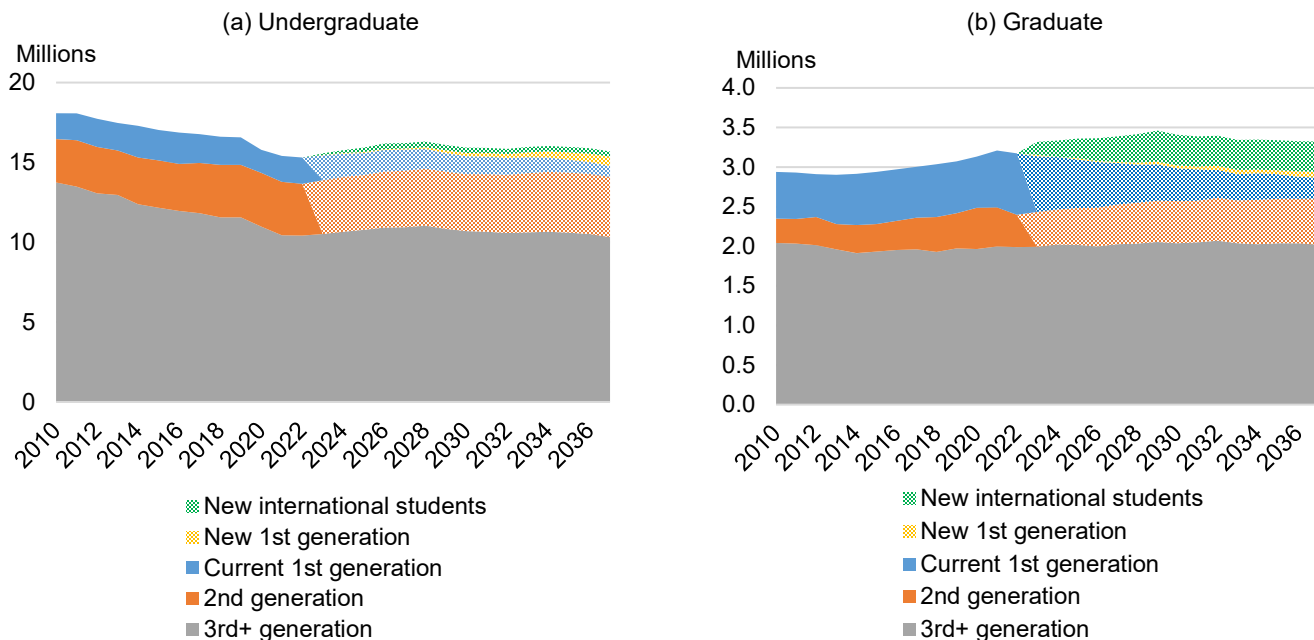
Note: Based on Current Population Survey October supplement data from IPUMS, <https://cps.ipums.org/cps/>, reweighted to sum to totals from U.S. Department of Education, National Center for Education Statistics (2024), "Digest of Education Statistics," <https://nces.ed.gov/programs/digest/>.

Growth in immigrant-origin students at the graduate level has been strong as well. In 2022, 1st generation immigrants accounted for 26% of graduate students, up from 20% in 2010. The 2nd generation accounted for 15% of graduate students in 2022, up from 11% in 2010. Growth in the number of 1st and 2nd generation students pursuing graduate degrees accounts for all of the growth in graduate students between 2010 and 2022. The number of 3rd+ generation students in graduate school fell by over 160,000 between 2010 and 2022, while the combined number of 1st and 2nd generation graduate students rose by over 400,000 during that period. Absent the growth in immigrant-origin students, the number of graduate students would have been almost 570,000 smaller in 2022 than in 2010.

Immigrant-origin students will remain critical to the viability of U.S. colleges and universities in the coming years. Figure 7 adds to Figure 6 the projected number of undergraduate and graduate students by immigrant generation through 2037 and distinguishes between three types of 1st generation students: those who are already present in

the United States in 2022 (the current 1st generation); those who would be expected to immigrate to the United States before age 18 and then attend college or graduate school (the new 1st generation); and those who would be expected to come to the United States to attend college or graduate school (new international students).¹¹ The gray portion of each panel in Figure 7 shows the projected student population if there are no 1st or 2nd generation immigrant students after 2022 (the most recent year of data available) and no changes in enrollment rates among the 3rd+ generation, i.e., if colleges and universities do not lower their admissions standards and if the same share of the 3rd+ generation attends college or university as was the case among that age and race/ethnic group in 2022.

Figure 7. Projected number of students through 2037 by immigrant origins and academic level



Note: Based on Current Population Survey (CPS) October supplement data for 2010-2022 from IPUMS, <https://cps.ipums.org/cps/>, reweighted to sum to totals from U.S. Department of Education, National Center for Education Statistics (NCES) (2024), "Digest of Education Statistics," <https://nces.ed.gov/programs/digest/>. Projections for 2023-2037 are based on the age structure of the existing U.S. population and enrollment rates by age, sex, and race/ethnicity in the 2022 CPS and the projected number of nonresidents (new international students) from the NCES.

As Figure 7 shows, the size of the projected 3rd+ generation enrolled in higher education is fairly stable between 2023 and 2037. This is surprising given the expected demographic cliff due to the post-2007 drop in U.S. births, and it suggests that enrollment rates and the racial/ethnic composition of the U.S. population may have shifted in

¹¹ The projections for the (current) 1st, 2nd, and 3rd+ generations are based on aging forward the existing U.S. population and applying 2022 undergraduate and graduate enrollment rates by single year of age, sex, and race/ethnicity. The projection for new 1st generation students is the cumulative gap between the expected size of the 1st generation based on historical trends and the projected size of the current 1st generation as it ages forward. The number of new international students is based on projections from NCES.

ways that will help stabilize higher-education enrollments. Much of the drop in the 3rd+ generation enrolled in higher education may have already occurred.¹² Nonetheless, immigrant-origin students are projected to account for a large and growing share of students enrolled in higher education. The undergraduate student population would be almost 5 million students smaller in 2037 than in 2022, or only about two-thirds of its 2022 size, absent immigrant-origin students. The graduate student population would be over 1.1 million students smaller in 2037 than in 2022, or only about 60% of its 2022 size, absent immigrant-origin students.

New international students are projected to account for 2% of undergraduate students and almost 11% of graduate students during 2025-2037. New 1st generation students – immigrants projected to move to the United States before reaching college-age and to later attend college or university – are projected to account for 1.6% of undergraduate students and 1% of graduate students during that period. An abrupt end to U.S. immigrant inflows could therefore reduce undergraduate student enrollment by about 3.6% and graduate student enrollment by almost 12%. Immigrant-origin students already present in the United States are projected to account for almost 30% of undergraduate students during 2025-2037, with 7% coming from 1st generation immigrants and almost 23% from 2nd generation immigrants. Immigrant-origin students already present in the United States are similarly projected to account for about 28% of graduate students, with 12% coming from 1st generation immigrants and 16% from 2nd generation immigrants.

IMPACT OF INTERNATIONAL STUDENTS

The sizeable number of international students has made higher education a major export sector for the U.S. economy. Education-related travel exports totaled over \$50 billion in 2023, ranking 7th among all services, according to the U.S. Department of Commerce.¹³ International students enrolled at U.S. colleges and universities contributed almost \$44 billion to the U.S. economy during the 2023-24 academic year, supporting more than 378,000 jobs, according to NAFSA: Association of International Educators.¹⁴

At the undergraduate and master's levels, international students represent a significant source of revenue for U.S. universities.¹⁵ Only a handful of private colleges and universities admit undergraduate international students on a

¹² However, the projections here do not incorporate place of residence because of the relatively small sizes of the October CPS samples when stratified by age and race/ethnicity. If the 3rd+ generation has shifted to areas with lower enrollment rates, projected enrollment among the 3rd+ generation is too high. The projections here also do not incorporate expected deaths among children before they reach college age. As such, the projections here can be viewed as a “best-case” scenario for colleges and universities.

¹³ See <https://www.trade.gov/education-service-exports>.

¹⁴ See <https://www.nafsa.org/about/about-nafsa/international-students-contribute-record-breaking-level-spending-and-378000-jobs>.

¹⁵ Private universities received about \$4.3 billion in revenue from international students pursuing master's degrees in 2015, and public universities \$3 billion. See Bound et al. (2021), op cit.

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“need-blind” basis.¹⁶ Many private schools instead admit international students on a “need-aware” basis that takes into consideration how much an international applicant can pay, based on their family resources. And at public universities, international students pay out-of-state tuition, which can be two to three times as high as in-state tuition. Tuition revenue has become increasingly important for many public universities as states cut their funding for higher education. Research shows that as public funding for universities falls, public universities tend to increase their number of international students. During 1996-2012, a 10% decrease in state appropriations is associated with a 16% increase in the number of undergraduate international students at public research universities, and a 22% increase at “top” public research universities, on average.¹⁷ And as public universities enroll more international students, they tend to reduce their tuition and fee “list prices” for in-state students.¹⁸

From the perspective of universities, master’s programs tend to cross-subsidize bachelor’s or doctoral programs.¹⁹ Universities typically award little financial aid for master’s degree programs, especially to international students. Doctoral programs, in contrast, are a cost center, not a revenue source, for universities since PhD students typically receive a tuition waiver and stipend. Research universities have doctoral programs nonetheless since they enhance university prestige and can help generate research funding. Doctoral students, including international students, help conduct research. They also serve as teaching assistants, which can enable universities to accommodate more undergraduate students.

Several studies of U.S. undergraduate or graduate programs conclude that international students do not crowd out U.S. students and may even increase their numbers. The higher tuition paid by international students can enable public universities to increase their total capacity, and international students’ overrepresentation in STEM can lead schools to increase their offerings in those fields, resulting in more Americans studying those fields. One study finds that for each additional international undergraduate student that public universities enroll, their in-state freshman enrollment increases by two, on average.²⁰ Another study shows that each additional 10 bachelor’s degrees awarded to international students at a college or university is associated with 15 more bachelor’s degrees in STEM

¹⁶ See Bound et al. (2021), op cit.

¹⁷ See John Bound et al., “A Passage to America: University Funding and International Students,” *American Economic Journal: Economic Policy* 12 (2020): 97-126, <https://doi.org/10.1257/pol.20170620>.

¹⁸ Mingyu Chen, “The Impact of International Students on US Colleges: Higher Education as a Service Export,” Brown University, Annenberg Institute EdWorkingPaper number 21-405 (2021), <https://doi.org/10.26300/x1wy-4d72>.

¹⁹ Chen (2021), op cit; Kevin Shih, “Do International Students Crowd-Out or Cross-Subsidize Americans in Higher Education?” *Journal of Public Economics* 156 (2017): 170-184, <https://doi.org/10.1016/j.jpubeco.2017.10.003>.

²⁰ See Chen (2021), op cit. As evidence of cross-subsidization between master’s students and undergraduates, increases in the number of international master’s students at a university lead to higher numbers of bachelor’s degrees awarded to domestic students four years later. See Julia Zhu, “Comparative Immigration Policies and the Resource Effects of International Students in U.S. Higher Education,” San Diego State University Department of Economics mimeo (2023).

Importance of Immigrants and International Students to Higher Education in America

majors being awarded to domestic students.²¹ In STEM fields, each additional PhD awarded to an international student in a STEM field is associated with an additional PhD awarded to a domestic student.²² Across all fields, an additional 10 international graduate students at a university increases the number of domestic graduate students by three.²³

International students who remain in the country make valuable contributions to the U.S. economy, including spurring entrepreneurship and innovation. Research shows that master's programs with more foreign students result in more businesses being created by graduates of those programs. A 10 percentage point increase in the share of foreign students in a master's cohort at a university results in that cohort founding an additional 0.4 start-ups within five years of graduation. Having more international students increases the number of businesses founded by U.S. students in that cohort in addition to more businesses being founded by immigrant-origin students.²⁴ Higher education is the main entry channel for immigrants who have become entrepreneurs – 75% of immigrants who have founded U.S. companies that received venture capital funding attended a U.S. college or university.²⁵ International graduate students boost U.S. innovation, as measured by patents both inside and outside universities.²⁶ Immigrants who entered the country on student visas are more likely to patent and publish than U.S. natives, in part because they are more likely to have studied a STEM field.²⁷

More broadly, international students are an important source of workers, particularly in the high-tech sector. About 23% of international students who earn a master's degree remain in the United States after graduation to work in the same state as the university they attended, and about 8% of bachelor's degree recipients.²⁸ The drop in international students during the pandemic likely reduced the number of foreign-born graduates with STEM degrees

²¹ Madeline Zavodny, "The Impact on U.S. Men and Women in STEM Fields of Increases in International Students," National Foundation for American Policy policy brief (2021), <https://nfap.com/studies/the-impact-on-u-s-men-and-women-in-stem-fields-of-increases-in-international-students/>.

²² Liang Zhang, "Do Foreign Doctorate Recipients Displace U.S. Doctorate Recipients at U.S. Universities?" in Ronald G. Ehrenberg and Charlotte V. Kuh, eds., *Doctoral Education and the Faculty of the Future* (Cornell University Press, 2008).

²³ Shih (2017), op cit.

²⁴ Michel Beine, Giovanni Peri, and Morgan Raux, "The Contribution of Foreign Master's Students to US Start-Ups," National Bureau of Economic Research working paper no. 33314 (2024), https://www.nber.org/system/files/working_papers/w33314/w33314.pdf.

²⁵ Natee Amornsiripanitch et al., "Getting Schooled: Universities and VC-backed Immigrant Entrepreneurs," *Research Policy* 52 (2023): 104782, <https://doi.org/10.1016/j.respol.2023.104782>.

²⁶ Gnanaraj Chellaraj, Keith E. Maskus, and Aaditya Mattoo, "The Contribution of International Graduate Students to US Innovation," *Review of International Economics* 16 (2008): 444-462, <https://doi.org/10.1111/j.1467-9396-2007.00714.x>.

²⁷ Jennifer Hunt, "Which Immigrants Are Most Innovative and Entrepreneurial? Distinctions by Entry Visa," *Journal of Labor Economics* 29 (2011): 417-457, <https://doi.org/10.1086/659409>.

²⁸ Beine et al. (2023), op cit.

from U.S. universities working in the country by 30,000 to 60,000 workers.²⁹ International students who return home create economic benefits for the United States as well, such as boosting exports.³⁰

CONCLUSION

The U.S. higher education sector faces considerable challenges, including a demographic cliff beginning in 2025 that will mean dramatically smaller numbers of domestic students or sizable changes in the composition of the student body. Even before that drop, almost 300 colleges and universities closed between 2008 and 2023.³¹ Many colleges and universities view international students as an important way to support and extend their offerings. As a result, enrollment of international students was rising consistently until the first Trump administration, which chilled international student enrollment, and then the pandemic, which caused a sharp drop in international students. International student enrollments have since resumed but have not yet returned to their pre-pandemic total. Another reduction in international students during the second Trump administration would hurt many U.S. higher education institutions.

Without enough international students, the ability of many U.S. universities to sustain their academic and co-curricular programs might be at risk, which would in turn make it more challenging for some U.S.-born students to attend college. Local and state economies that depend on student spending and higher education employment would face challenges as well. Research and innovation would fall, particularly in STEM areas.³² Entrepreneurship would decline as well. The risks extend to U.S. employers in science- and technology-intensive sectors outside of academia since international students are a critical source of future workers in many STEM occupations.³³

Other English-language countries have recognized the advantages to recruiting international students and have attracted growing numbers of them. Flows to Canada and Australia have become so high that those countries announced plans in 2024 aimed at reducing their numbers of international students. Tighter policies elsewhere potentially create a strategic opening for the United States to attract more international students. Doing so would help ensure the viability of some higher education institutions or programs. Coupled with OPT and other pathways for international students to remain in the country after graduation, it would also create a larger U.S.-educated workforce, particularly in the STEM fields that drive innovation and are critical to future economic growth.

²⁹ See <https://www.nber.org/digest/202212/contribution-international-students-us-labor-supply>.

³⁰ Lena Specht, "International Trade Effects of Student Migration," Utah State University, Center for Growth and Opportunity working paper (2023), <https://www.thecgo.org/research/international-trade-effects-of-student-migration/>.

³¹ See <https://hechingerreport.org/tracking-college-closures/>.

³² Eric T. Stuen, Ahmed Mushfiq Mobarak, and Keith E. Maskus, "Skilled Immigration and Innovation: Evidence from Enrollment Fluctuations in US Doctoral Programs," *Economic Journal* 122 (2012): 1143-1176, <https://doi.org/10.1111/j.1468-0297.2012-02543.x>.

³³ Beine et al. (2023), op cit.

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