

Date: December 15, 2022

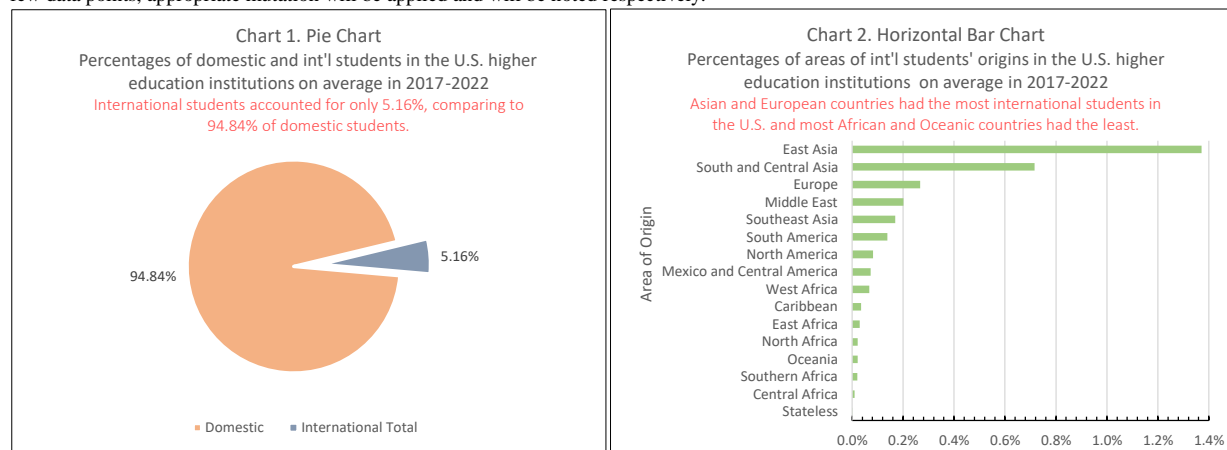
To: Alton B.H. Worthington

From: Cheng, Chia Wen

Re: Visualization Portfolio Data Report – International students' mobility, academic, and post-graduation statistics in the U.S. higher education institutions

## I. Data Present

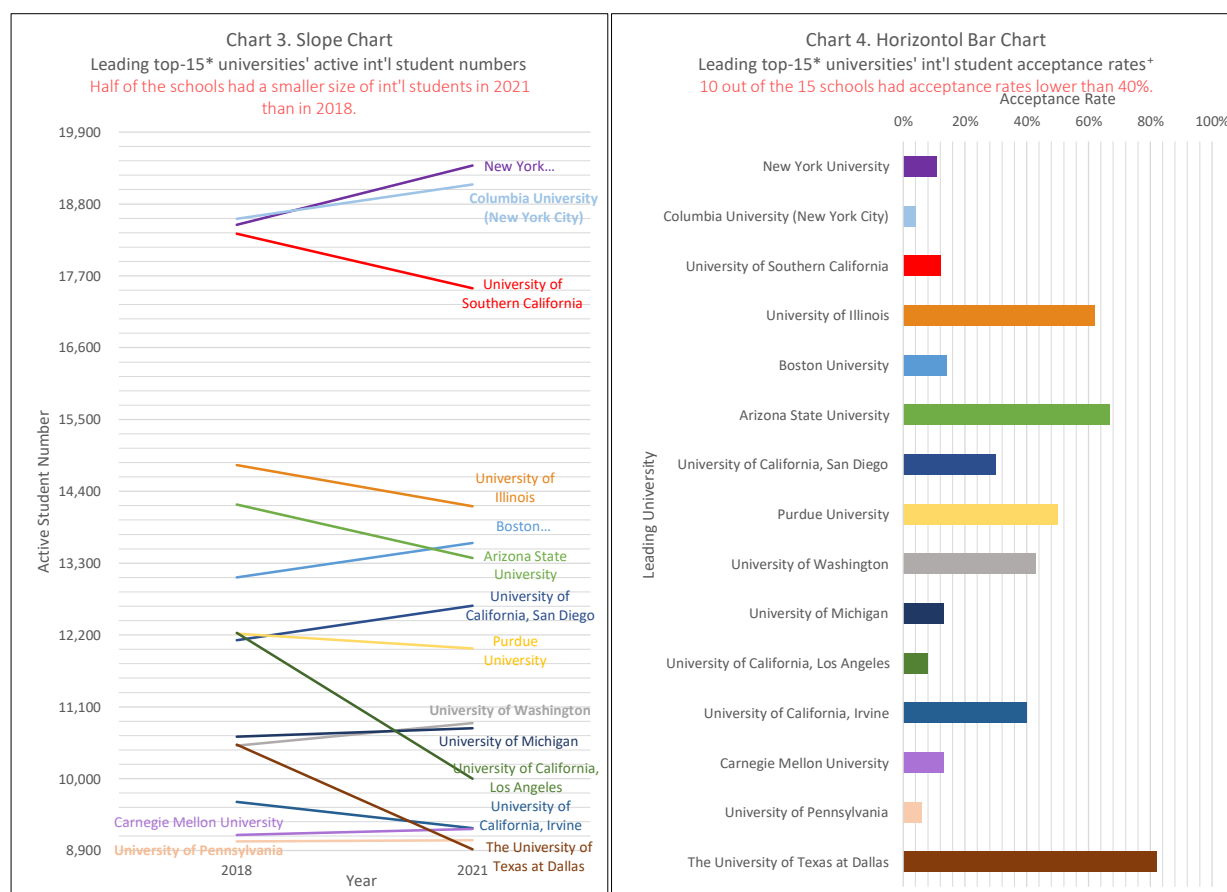
This memo seeks to look at international students' mobility, academic, and post-graduation statistics in the U.S. higher education institutions. Due to the restraints of data collection, this memo will only present gainable data from the academic year 2017/2018 to 2021/2022. While this has been a short period of study, the official institutes do not guarantee to provide consistent data for each year. When inconsistency causes lack of a few data points, appropriate mutation will be applied and will be noted respectively.



Data Sources: Open Doors Data. (2022.) The total number of enrolled international students by place of origin. Retrieved on Dec 13, 2022, from <https://opendoorsdata.org/data/international-students/all-places-of-origin/>.

Open Doors Data. (2022.) The total number of international students. Retrieved on Dec 13, 2022, from <https://opendoorsdata.org/data/international-students/enrollment-trends/>.

On average from academic year 2017/2018 to 2021/2022, international students composed of about 5.16% of the students in higher education institutions in the U.S. East Asian, South and Central Asian, and European countries are the top three areas that had the greatest numbers of students coming to the U.S. across these years. However, the number of East Asian students was nearly twice as large as the number of South and Central Asian students, and South and Central Asian students were almost two and a half times greater than European students. Stateless, Central African, Southern African, Oceanic, and Northern African countries had the least students coming to pursue a degree or a non-degree in the U.S. They collectively formed up to 0.07% of all the students in higher education institutions in the U.S.



\*Only F-1 students are counted in the numbers of active students. Leading schools without complete data from 2018-2021 and acceptance rates are excluded; thus, only 15 schools are included in this chart while the data shows 20 schools.

\*Acceptance rates are collected until April 2021.

Data Sources: College Transitions. (2021.) Data Verse: International Admission. Retrieved on Dec 13, 2022 from <https://www.collegetransitions.com/dataverse/international-admission>.

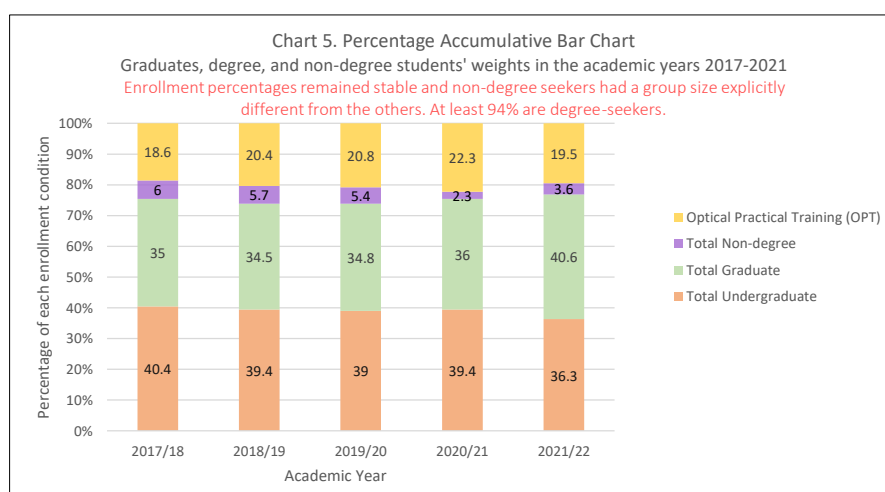
U.S. Immigration and Customs Enforcement. (2018, 2019, 2020, and 2021.) SEVIS By the Numbers: Annual Report on Nonimmigrant Student Trends.

Charts 3 and 4 listed the numbers and the acceptance rates of the students in the leading top-15 universities in descent order according to 2021 data. "Leading universities" have no relationship with their academic rankings, but have the greatest numbers of F-1 students with complete data in both years 2018 and 2021. The acceptance rates shown in Chart 4 is computed by international admissions divided by numbers of international applicants.

New York University, Columbia University, and University of Southern California sustained leadership in international student numbers throughout years 2018 to 2021. NYU, Columbia, BU, and UCSD had explicit increases of about 500-900 international students. A decrease can be seen in USC, UoI, ASU, Purdue, UCLA, UTD, and UCI. UCLA and UTD dropped especially drastically with a change of more than 1,000 students.

Comparing the acceptance rates between international students and domestic students can be powerful in addressing between-group inequality. However, a study showed that the difference between them are not significant. Thus, it does not affect our data presentation very much.

From Chart 4, we found UTD, ASU, UoI, and Purdue had the highest international student acceptance rates at or above 50% before April 2021. Nonetheless, high acceptance rates did not lead to greater group sizes of international students in those schools. They even faced decreases of numbers of active international students from 2018 to 2021, possibly implying the decreasing numbers of international applicants, but further information is required for this conclusion. On the contrary, Columbia University, having the lowest acceptance rate of 4% before April 2021, had the greatest number of international students in 2018 and the second largest size in 2021.

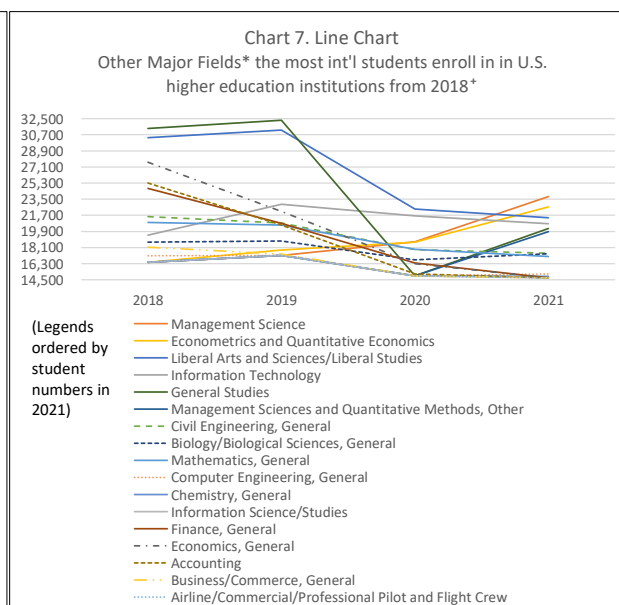
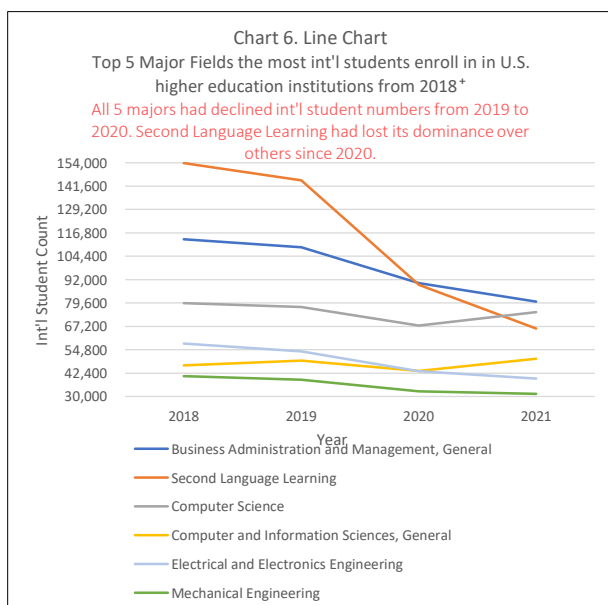


\*Total Enrollment = Total Undergraduate + Total Graduate + Total Non-degree

Data Source: Open Doors Data. (2022.) The total number of enrolled international students by academic level. Retrieved on Dec 13, 2022, from <https://opendoorsdata.org/data/international-students/academic-level/>.

Within the international students, Bachelor-degree and Associate-degree-pursuing students are the greatest group in the first four years, composing nearly 40% of all. Graduate students including Masters, Doctorals, and Professionals are followed by students enrolling in OPT program, and they became the largest group in academic year 2021/2022. Non-degree seekers are the least across these years.

Reasons that total graduate international students took the first place in academic year 2021/2022 instead of total undergraduate international students may vary. The expansion of STEM programs, the different structure of origins of students, and undergraduates in class of 2020 pursuing an advanced degree after their graduation are some of the possible factors. Without further information, the reason remains unknown.



\*Statistics about levels of study were not published until 2018; thus, these two charts present data from 2018 instead of 2017.

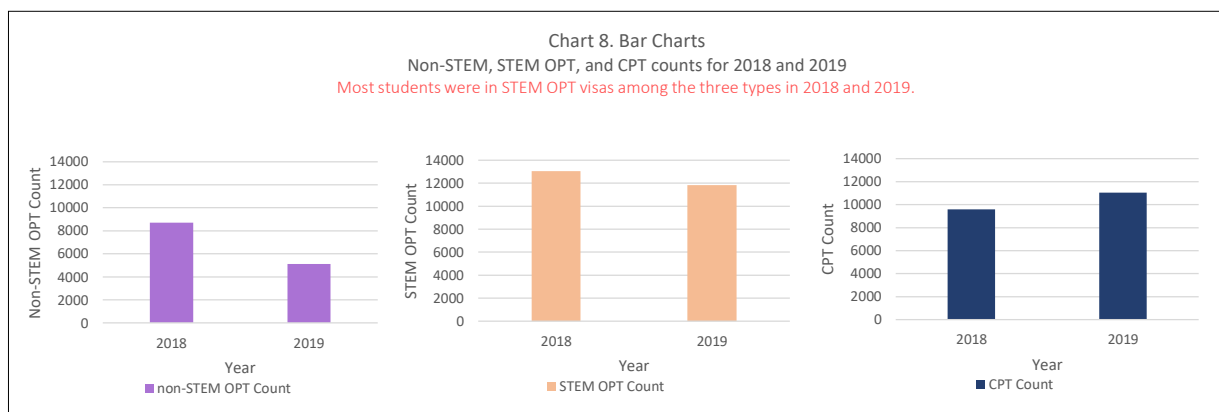
\*High school and regular/general high school registration numbers are within the top 20 across these years but are excluded from this study. If high school registration numbers were included, the aggregation of these majors composed of about half of the fields of studies of international students. To present consistent data, majors not in the top 20 of the year are imputed with a number less than the minimum number listed of the year.

Data Sources: U.S. Immigration and Customs Enforcement. (June 2017.) SEVIS By the Numbers: Biannual Report on International Student Trends.

U.S. Immigration and Customs Enforcement. (2018, 2019, 2020, and 2021.) SEVIS By the Numbers: Annual Report on Nonimmigrant Student Trends.

Second language used to be the most popular program international students enrolled in. However, it had been replaced by Business Administration and Management General studies, which used to be the second popular major, since the year of 2020. Computer Science, Electrical and Electronics Engineering, Computer and Information Sciences, and Mechanical Engineering remained in the top choices of international students across this period of study. Airline/Commercial/Professional Pilot and Flight Crew, Information Science/Studies, Computer Engineering, and Business/Commerce General stayed in the bottom with least registered international students among the top-22 programs of studies across the years of study.

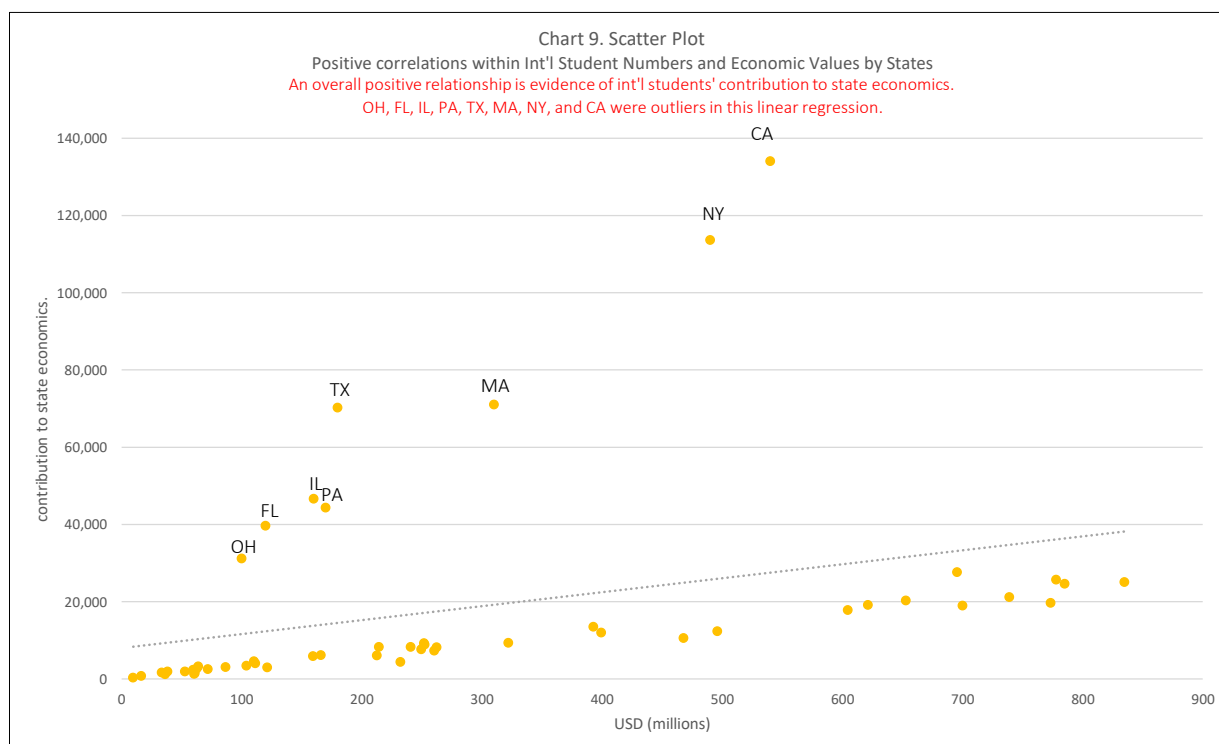
Interestingly, the numbers of registration of most of the top chosen programs by international students showed a trend of decreasing across these years. Management Science and Econometrics and Quantitative Economics were the only two programs with stably growing numbers of international students enrolling in. In addition, listed programs other than Management Science and Econometrics and Quantitative Economics all declined from the year 2019 to the year 2020, which may be a result of the COVID-19 pandemic. But without detailed information, the affected reason is still a speculation only, and reasons for reverse growths in Management Science and Econometrics and Quantitative Economics remain an interesting topic looking for further research.



Data Sources: U.S. Immigration and Customs Enforcement. (June 2017). SEVIS By the Numbers: Biannual Report on International Student Trends.

U.S. Immigration and Customs Enforcement. (2018, 2019, 2020, and 2021.) SEVIS By the Numbers: Annual Report on Nonimmigrant Student Trends.

From Chart 8, higher amounts of OPT in STEM programs were used comparing to non-STEM programs. Furthermore, it is easily seen that more students successfully secured a position in the U.S. after graduation and used OPT in year 2018 than in 2019. However, more international students applied for CPT in 2019 than in 2018, which may indicate that there were more registered and active students in 2019 because CPT can only be applied during years of study. This speculation goes aligned with previous data, where there was an increase of international student counts across most of the leading 22 universities from 2018 to 2019. But it may also imply that entrepreneurs expanded their positions for registered students, such as internship positions, in the year of 2019, and thus more schooling students were able to get an off-campus part-time job while taking courses.



Data Sources: NAFSA. (2022.) The United States of America-Benefits from International Students. Retrieved on Dec 13, 2022 from chrome-extension://efaidnbmnnnibpcajpcgiclfmkaj/https://www.nafsa.org/sites/default/files/media/document/EconValue-2022.pdf.

NAFSA. (2022.) International student Economic Value Tool. Retrieved on Dec 13, 2022 from [www.nafsa.org/economicvalue](http://www.nafsa.org/economicvalue).

Chart 9 shows the positive correlation of numbers of international students and economic values international students contributed to states in academic year 2021/2022. Where more international students were, there were greater additional economic values devoted by international students.

The eight outliers had extreme high numbers of international students comparing to the other states. While they did not benefit as much from the large size of international students as the other states did, the eight states remained a positive correlation with each other, once again providing evidence for the statement: with more international students, greater additional economic values existed.

## **II. Recommendation**

International students contribute to a fairly small part of students active in higher education institutions in the U.S., which is smaller than 6%. However, international students are very important to the U.S. labor market and economic activities, where a large proportion of them are in STEM programs, pursuing a post-secondary school or advanced degree, and devote to the labor market with OPT after graduation. With the goal of enhancing degree of DEI, insignificant difference in acceptance rates between international students and domestic U.S. students is just the initial move. The lack of further international students' academic engagement and personal perspective data makes it difficult to analyze and reveal more international students' needs in every life aspect. The large differences among areas of origins of international students may also expose global inequality, or simply cultural and value differences. More investigations are needed to determine. The government should implement surveys or mental health conditions of international students and keep an eye on their academic activities to reveal any struggling that assistance may be extremely helpful. The success in international students will be transferred to the success and greatful economic growth of the U.S. And thus ensuring positive incentives are well given to potential international students by multiple visa, equitable fellowship, and sufficient academic service opportunities may be a strategy in boosting the U.S. economics and competitiveness around the world.