

The Geography of Foreign Students in U.S. Higher Education: Origins and Destinations

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SUMMARY OF FINDINGS

This report uses a new database on foreign student visa approvals from 2001 to 2012 to analyze their distribution in the United States, finding that:

- **The number of foreign students on F-1 visas in U.S. colleges and universities grew dramatically from 110,000 in 2001 to 524,000 in 2012.** The sharpest increases occurred among students from emerging economies such as China and Saudi Arabia. Foreigners studying for bachelor's and master's degrees and

English language training accounted for most of the overall growth.

- **Foreign students are concentrated in U.S. metropolitan areas.** From 2008 to 2012, 85 percent of foreign students pursuing a bachelor's degree or above attended colleges and universities in 118 metro areas that collectively accounted for 73 percent of U.S. higher education students. They contributed approximately \$21.8 billion in tuition and \$12.8 billion in other spending—representing a major services export—to those metropolitan economies over the five-year period.
- **Most foreign students come from large fast-growing cities in emerging markets.** Ninety-four (94) foreign cities together accounted for more than half of all students on an F-1 visa between 2008 and 2012. Seoul, Beijing, Shanghai, Hyderabad and Riyadh are the five foreign cities that sent the most higher education students to the United States during that time.
- **Foreign students disproportionately study STEM and business fields.** Two-thirds of foreign students pursuing a bachelor's or higher degree are in science, technology, engineering, mathematics (STEM) or business,

management and marketing fields, versus 48 percent of students in the United States. Both large (San Jose, Calif.) and small (Beaumont-Port Arthur, Texas) metro areas figure among those with the highest shares of their foreign students in STEM disciplines.

- **Forty-five (45) percent of foreign student graduates extend their visas to work in the same metropolitan area as their college or university.** Metro areas that retain high shares of their foreign graduates under the temporary Optional Practical Training (OPT) program tend to be either large diversified economies (e.g., New York, Los Angeles), or specialized labor markets that align closely with foreign graduates' training (e.g., Honolulu, Seattle, Las Vegas).

These findings suggest that foreign students can provide important economic benefits to their U.S. metropolitan destinations—serving as bridges back to their growing home cities and offering valuable skills to local employers. More metropolitan leaders should emulate leading practices that capitalize on the knowledge and relationships of foreign students to strengthen local economies while also maximizing

students' educational and professional experiences in the United States.

LISTEN: Neil Ruiz discusses this report on the [Brookings Cafeteria podcast](#).

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DATA

Akron, OH

CHANGE LOCATION

View Data For: U.S. Metro Area Destinations of Foreign Students Cities of Student Origin Countries of Student Origin

Size of the Foreign Student Population

In Akron, 2008–2012

Number of F-1 Visa Holders
4,753
Rank: 50th of 118 metro areas.

On foreign student "intensity," Akron ranked 62nd, with 21.2 foreign students per 1,000 total students.

All told, these foreign students paid \$70,717,440 in tuition and \$50,460,201 in living costs.

Levels of Degree Pursued

Share of foreign students in Akron pursuing a bachelor's, master's, or doctorate degree, 2008–2012

43.8%39.9%16.3%Bachelor'sMaster'sDoctorate0.0%100.0%25.0%50.0%75.0%

Top majors of foreign students: business, management, marketing, and related support services (1,440 foreign students); engineering (695); computer and information sciences and support services (417); physical sciences (390); and education (351).

STEM Enrollment

Share of foreign students in Akron pursuing a degree in science, technology, engineering, or math

STEM42.5%Non-STEM57.5%

Rank: 57th of 118 metro areas.

Foreign Student Retention

Share of Akron's foreign student graduates who found employment under the OPT program that stayed to work in the metro area

21.6%78.4%Stayed in the metro areaDid not stay in the metro area

Rank: 90th out of 118 metro areas on this measure of foreign student retention.

The Optional Practical Training (OPT) Program allows F-1 visa holders to work full-time in the U.S. after graduation. STEM degree holders are permitted to stay for 29 months, while non-STEM degree holders are permitted to stay 12 months under the program.

Top Origin Cities and Countries of Foreign Students

ORIGIN CITY	NUMBER OF STUDENTS
Riyadh, Saudi Arabia	242
Beijing, China	236
Jeddah, Saudi Arabia	170
Shanghai, China	156
Hyderabad, India	135

ORIGIN COUNTRY	NUMBER OF STUDENTS
China	1,778
Saudi Arabia	752
India	562
Taiwan	131
Iran	99

Top Destination Institutions

SCHOOL NAME

Hiram College

SCHOOL NAME

Kent State University

The University of Akron

Map: 118 U.S. Metro Areas with at Least 1,500 Foreign Students, 2008–2012



1,5342,3563,9619,520101,586Akron, OH4,753Rank (1 implies largest value):50th

Data source: Brookings analysis of data from U.S. Immigration and Customs Enforcement obtained through a Freedom of Information Act (FOIA) Request. All data are aggregates across the 2008–2012 time period.

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INTRODUCTION

The United States is the preeminent global hub for academic training. In the 2012-2013 academic year the United States hosted a record 819,644 international students, 21 percent of all students studying abroad worldwide.¹ America's renowned educational institutions, global networks of students and professionals and high-level research and innovation activities combine to attract hundreds of thousands of students each year.

The benefits these students provide their colleges and universities are well understood. Only recently, however, have local leaders begun to appreciate that

students from fast-growing foreign economies can also be important anchors in building global connections between their hometowns abroad and their U.S. metropolitan destinations. With knowledge of both markets, foreign students can be valuable assets to local business communities that are seeking to expand globally and the wider metropolitan economies in which they sit.

Recent evidence links skilled migration to transnational business creation, trade and direct investment between the United States and a migrant's country of origin.² AnnaLee Saxenian pioneered this research agenda by linking the entrepreneurial activities of U.S.-educated foreigners in Silicon Valley with their home regions through what she terms *brain circulation*.³ Using case studies and surveys, Saxenian argues that immigrant entrepreneur networks play a critical role in technology industries' international expansion, linking Silicon Valley to new technology hubs in Bangalore (India), Hsinchu Technology Park (Taiwan) and Shanghai (China).⁴ Economists argue that migrants can increase the availability of valuable market information for exporters from origin- and destination-countries, find buyers, learn about regulatory requirements and overcome market imperfections.⁵ Research has also found a relationship between the presence of migrants

with college educations in the United States and increases in U.S. foreign direct investment (FDI) to the migrants' homeland.⁶ Robert Guest argues that the United States' ability to attract and keep migrants allows the country to tap powerful diaspora networks around the globe.⁷

Fears of a brain drain occurring if high-skilled foreign students from developing countries, especially from small nations, study in the United States and stay also exist.⁸ But new research shows that expatriates can also have a positive impact on their home communities from abroad.⁹ High-skilled migrants can serve as bridges between their origin and destination communities, acting as conduits for knowledge transfer and valuable business linkages.¹⁰

Notwithstanding the benefits from economic linkages through skilled migration, efforts to reform the visa and immigration process to ease the way for foreign students to remain in the United States after graduating remain contentious amid a rancorous debate over broader immigration reform.

One proposal is that the United States should issue green cards (permanent legal residency) to foreign students who graduate from American universities. They assert that these foreign students are studying

fields in short supply in the labor market.¹¹ In his book *The Immigrant Exodus*, Vivek Wadhwa argues that high-skilled immigrants and entrepreneurs frustrated with current U.S. immigration law are either returning to their home countries or migrating to countries with more friendly immigration systems.¹² Proponents of retaining foreign students argue that the current law, which limits the number of visas issued to each country, causes employment-based green card backlogs for Indian and Chinese nationals, often lasting 10 years or more. To avoid these delays they believe the United States should adopt a policy of issuing permanent resident status to foreign graduates of U.S. universities who have obtained an offer of employment.¹³

Others argue that there are enough skilled native-born workers to perform high-skilled jobs and that employers are taking advantage of the visa system and using foreign labor for its low cost and exploitability. In a 2004 study, George Borjas found that foreign students limit opportunities in higher education for white native-born American males, especially at the most elite universities.¹⁴ Borjas also shows that allowing more foreign doctorate degree holders to enter the U.S. labor market lowers the wages of competing workers.¹⁵ Norm Matloff compares former foreign students with

Americans of the same education and age and shows that foreign workers are paid less, have fewer patent applications and Ph.D. dissertation awards and are less talented overall than their American counterparts.¹⁶ He argues that allowing foreign students to enter the labor market would depress wages for U.S. workers.

To date, the majority of the analytical research on the foreign student population in the United States has focused on national trends, with little discussion of the different metropolitan areas in which they study or from which they originate globally.¹⁷ The United States is not a unified national labor market, but a collection of distinctive regional labor markets. The large majority of these metro areas are home to thousands of foreign students who would be affected by changes to immigration policy aimed at easing students' entry into the labor market after they graduate. Moreover, as U.S. metro areas become more globally engaged, the relationship students have with their home markets, particularly large and emerging cities, are a significant potential source of demand for U.S. metro economies. For these reasons, it is important to understand metropolitan trends in where foreign students study, from which cities they come and where many students work temporarily once they graduate.

Using a unique and never previously accessed government database, this report examines these questions for foreign students studying in the United States under an F-1 visa from 2001 to 2012. It begins with background on the F-1 visa program, detailing its intent, rules and implementation. Next, the paper provides an overview of the key terms, data and methodology employed in this analysis (with further details in Appendix A). The next section presents the results of this analysis—national trends of foreign students on F-1 visas, intensity, fields of study, city and country of citizenship, funding streams and retention rates—first at the national level and then with metropolitan and global city variation. Finally, the report concludes with a discussion on policy and practical steps that leaders at the global, national and local levels can take to maximize the economic and educational benefits of foreign students' presence in U.S. metropolitan markets.

BACKGROUND

International migration for educational purposes is a substantial fraction of the global movement of skilled migrants.¹⁸ International students include those pursuing language and certificate programs, secondary

schooling and associate's, bachelor's, master's, professional and doctoral degree programs.

Since the first *Open Doors* publication in 1954, the Institute of International Education (IIE) has surveyed American colleges and universities to measure foreign students in the United States.¹⁹ From the beginning of that survey, the United States has remained the leading destination of foreign students worldwide.²⁰ In the 2012-2013 school year, the United States received a record number of foreign students (819,644) studying in its colleges and universities, up 7 percent from the previous year.²¹ Despite this increase, only 3.4 percent of total higher education enrollment in the United States is foreign students—a share that has remained relatively constant over the past 60 years.²² Other popular destinations for student migrants (in descending order) are the United Kingdom, Australia, France, Germany, Japan, China, Italy, Austria and South Africa.²³ In some of these countries, foreign students represent a much higher share of higher education enrollment in 2010 (15.7 percent in the United Kingdom, 21.2 percent in Australia, 11.6 percent in France).²⁴

Types of Foreign Student Visas

Foreign students can enter the United States under three visa types depending on the type of educational institution or program of study.

F-1 Visa

The F-1 visa is the most common visa issued to foreigners studying in a full-time academic program. Students must be accepted by an approved school, document they have sufficient funds to cover 12 months of expenses and demonstrate academic preparedness to succeed in the program. Programs must be at a Student and Exchange Visitor Information System (SEVIS) certified school. F-1 students are admitted to the United States for the “duration of status” until the program is complete.

J-1 Visa

The J-1 visa is used for foreign students, scholars, teachers, trainees, international visitors, au pairs and participants in travel-study programs. This visa is intended for cultural exchange purposes, such as the Fulbright Scholarship program. J program sponsors must be recognized by the U.S. State Department’s Bureau of Educational and Cultural Affairs of the United States. If the program is funded by the foreign or U.S. government, or if the skills the J-1 visa holder is coming to develop or acquire are on the State Department’s “Skills List” for J-1s country of citizenship or permanent residency, then she or he must return to their home country for two years at the end of the exchange program, or obtain a waiver of that requirement before being eligible for a change of status to an H or L visa, or lawful permanent residence. J-1 visa holders are admitted to the United States for “duration of status,” as long as their program lasts.

M-1 Visa

The M-1 visa is used for non-academic, vocational study purposes only. This visa is the least common and is granted for only one year. Students must be accepted by an approved program, show sufficient funding and demonstrate sufficient academic preparation. M-1 students are admitted to the United States until a specific date keyed to the duration of their program of study.

Source: Chad C. Haddal, “Foreign Students in the United States: Policies and Legislation,” Washington, DC: Congressional Research Service, 2006, updated January 31, 2008.

There are three types of visas allowing foreign students to enter the United States, depending on the type of program and institution in which they enroll (see “Types of Foreign Student Visas”). The most common of these is the F-1 visa program. Introduced in the Immigration and Nationality Act of 1952, the program allows foreigners to study full-time at educational institutions in the United States.²⁵ This analysis focuses on F-1 visas for three reasons. First, F-1 visa holders represent 78.1 percent of all foreign students in 2012.²⁶ Second, the F-1 visa is used for a wide range of full-time academic programs including language training, test preparatory programs and associate’s, bachelor’s, master’s, professional and doctoral degree programs. Third, policymakers are considering changing the F-1 visa into a “dual intent” visa that would allow students studying for a bachelor’s degree or above a direct path to permanent residency with employer sponsorship.²⁷ These proposals are meant to streamline the current immigration system, which currently requires foreign students seeking permanent employment to apply for multiple temporary statuses such as the Optional Practical Training (OPT) program and the H-1B temporary worker program while waiting for a green card to become available.

As with other foreign student visas, there is no limit on the number of F-1 visas that can be issued annually.²⁸ However, national security policies that affect immigrant admissions to the United States cause fluctuations in the use of F-1 visas. The 1993 World Trade Center bombing by a terrorist in the United States on a student visa led to increased tracking of international students.²⁹ President Bill Clinton signed the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996 into law as a reaction to these (and other) concerns to mandate new documentation, tracking and reporting of international students.³⁰

In the early 2000s, foreign students attracted scrutiny once again as one of the hijackers in the 9/11 terrorist attacks held a foreign student visa.³¹ In their aftermath, legislators contemplated proposals to deny international students access to sensitive courses and access to research projects funded by the federal government.³² In response to 9/11, the USA Patriot Act of 2001 and the Enhanced Border Security and Visa Reform Act of 2002 included provisions for expanding government electronic monitoring of foreigners in the United States and authorizing funds to maintain a new foreign student monitoring system.³³

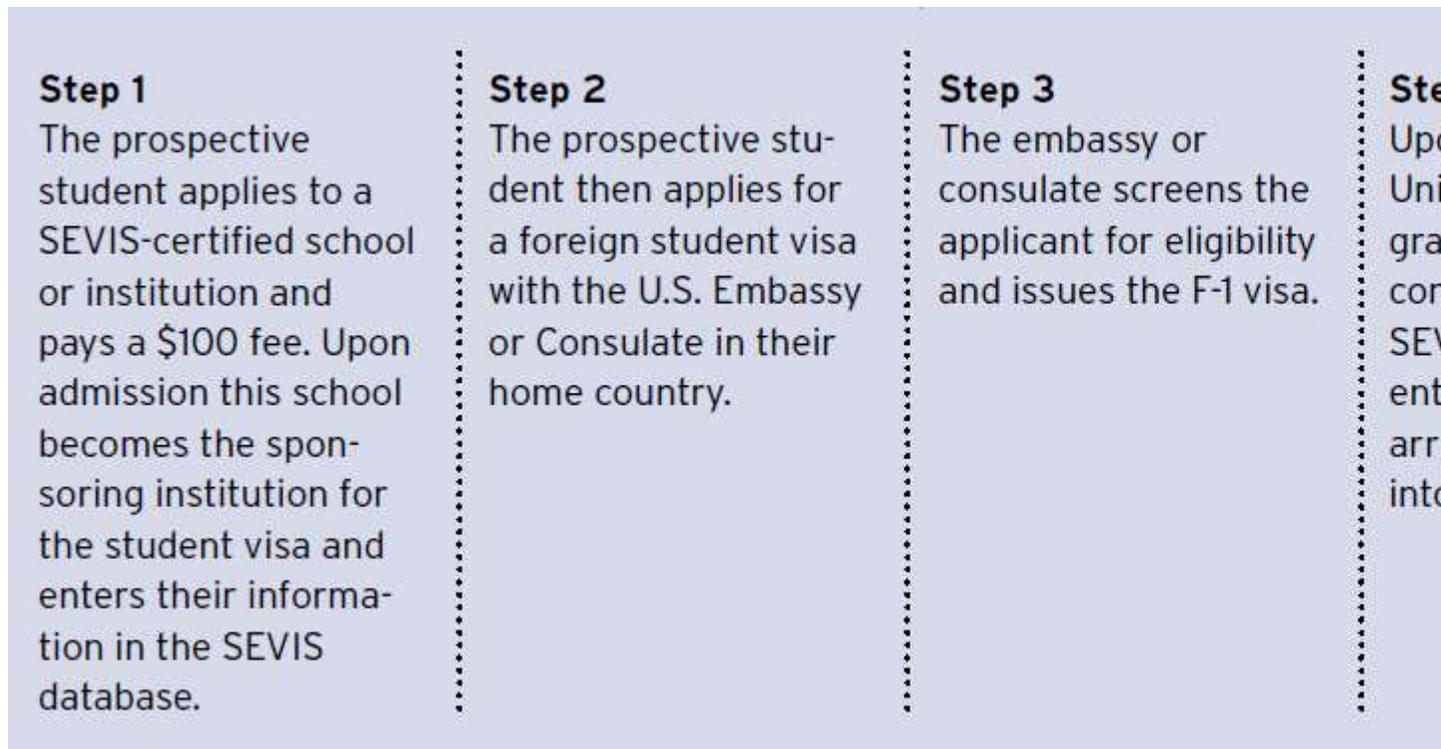
The Student and Exchange Visitor Information System (SEVIS) became fully operational electronically in 2003 to track and monitor the status and activities of students on non-immigrant visas and exchange visitors that enter the United States.³⁴ SEVIS places the onus on educational institutions to keep abreast of foreign students' academic progress, activities and any changes of address or course of study.³⁵ Congress requires all schools to use SEVIS to report whether their foreign students arrive on campus and are actually taking courses.³⁶ Schools also have to update foreign students' files each term with information on whether they change their academic majors or if they fall behind in progress toward their degrees.³⁷

Process for Applying for F-1 Visa

The process for applying for an F-1 visa involves several steps, the first of which is to apply and get admitted into a SEVIS-certified school. Once admitted, the school becomes the sponsoring institution for a student visa and enters the foreign student's information into the SEVIS database, generating a paper I-20 form to include in the student's admissions packet. Once the prospective student receives I-20 form, she applies for a foreign student visa through the U.S. Embassy or consulate in her home country. During

this step, the applicant is screened for security risks (terrorist, health or criminal), does not have a criminal record and does not meet any other inadmissibility criteria as outlined in the Immigration and Nationality Act of 1952. After the foreign student is awarded a visa, and upon her arrival into the United States, immigration inspectors confirm her SEVIS record and enter her arrival information into the SEVIS database.³⁸ The sponsoring school is then responsible for confirming that the foreign student is attending classes and must update SEVIS for any changes in her enrollment status, major, or any disciplinary actions.³⁹

Figure 1. The F-1 Visa Process



Training and Work Programs

The F-1 visa is a non-immigrant visa that does not provide a direct path to permanent residency and has limited use for employment purposes. F-1 visa holders can seek temporary work authorization while a student through on-campus employment, off-campus employment because of severe economic hardship, a special student relief program and certain employment sponsored by international organizations.⁴⁰

Beyond these exceptions, two programs allow current and graduating F-1 visa holders to work for an off-campus employer: Curricular Practical Training (CPT) and Optional Practical Training (OPT).⁴¹ If the F-1 visa holder wants to receive work authorization for a longer period after graduation, they typically apply for an H-1B visa through their employer.

Through the *CPT program*, students on F-1 visas can work full-time or part-time while completing a degree program. Employment must be integrally related to an established curriculum, be in the student's major field of study and be approved by the designated school official who coordinates with the employer.⁴² CPT participants

are usually limited to working 20 hours or fewer per week during the regular terms, while full-time employment is usually authorized during the summer.⁴³ Graduate students in advanced candidacy status are typically allowed to work full-time during the regular term if employment is an integral part of their degree programs.⁴⁴ Students who enroll in full-time employment under the CPT program for more than 12 months would be ineligible to apply for optional practical training (OPT) post-graduation.⁴⁵

The *OPT program* allows F-1 visa holders to work full-time in the United States for up to 12 months (for non-science, technology, engineering and mathematics (STEM) degree holders) or 29 months (STEM degree holders) after receiving their U.S. bachelors, masters, or doctoral degree.⁴⁶ There is no limit on the number of OPT authorized per year, but the program requires approval by the foreign student's school and the Department of Homeland Security. F-1 visa holders are eligible for this post-graduation work authorization after each successively higher degree program they complete.⁴⁷ This program was designed to be part of the educational process by providing practical work experience for recent graduates with F-1 visas to sharpen and add to the skills they learned in school.⁴⁸ In 2008, President George W. Bush extended the period

of OPT for STEM students to help bridge the gap between OPT and pending H-1B visa petitions.⁴⁹ As of November 2013, there were an estimated 100,000 F-1 students using the OPT program.⁵⁰

The *H-1B visa* is a non-immigrant employment-based visa that allows employers to hire foreigners to work in specialty occupations on a temporary basis. Specialty occupations are defined as “requiring theoretical and practical application of a body of highly specialized knowledge and the attainment of a bachelor’s degree or higher (or its equivalent) in the field of specialty.”⁵¹ Visas are granted in up to three-year increments with the option to extend up to six years. Referred to as a “dual intent” program, the H-1B visa allows foreigners to work temporarily on a non-immigrant visa while taking steps toward permanent residency through employer sponsorship or other means.⁵² Visas are issued to employers on a first-come-first served basis with an annual H-1B visa cap set at 65,000, with an additional 20,000 visas for workers with advanced degrees from U.S. institutions.⁵³

This section explains the main data sources, key terms and methods used in this report. Further details are available in Appendix A.

I-20 Form Data on Foreign Students on F-1 Visas

The primary data source for this study is the I-20 forms generated by U.S. Immigration and Customs Enforcement (ICE). Those forms contain information from the Student and Exchange Visitor Information System (SEVIS) submitted by schools that foreign students attend under an approved F-1 visa from 2001 to 2012. Obtained through a Freedom of Information Act (FOIA) request, these data contain the student's country of birth, country of citizenship, course of study and level of education, the institution code/name/location for where the student will study, estimated cost of term, means of support and home city and country.⁵⁴

Interpretation and Limitations of the F-1 Data

The F-1 visa approvals data are limited in several important respects. The first and foremost is that the SEVIS database contains records of every F-1 visa approved and the school is responsible for continually updating the database. Each incoming foreign student

in F-1 status is represented by one record in SEVIS for the duration of their degree program. If the school does not update the information in the SEVIS database, there could be inaccuracies, though unlikely due to the high profile of national security concerns.⁵⁵ Second, a small proportion of F-1 visa approvals could be duplicates in the database if the foreign student violated the terms of an F-1 visa and re-entered the same school and program under a new SEVIS record after having left the country for a certain period of time. Third, F-1 visa approvals are for foreign students for one school and a specific degree program. If a foreign student continues to stay in the United States to pursue another degree program, even if this new degree program is at the same school, that student would be issued a new F-1 visa approval, creating the possibility of duplicates. Fourth, F-1 approvals could contain foreign students who were granted Optional Practical Training (OPT). Colleges and universities are responsible for entering information and monitoring the employment activities of F-1 visa holders who were approved for OPT, even if the new graduate no longer lives in the area.⁵⁶ Finally, the database has a field for the source of financing for each student's expenses. The cost of attending the school, including tuition and estimated living expenses, is included for every F-1 approval in the dataset. These data are used to

estimate the economic impact of foreign students on U.S. metropolitan areas. The data also include the student's means of support and education financing (e.g., personal funds, scholarships, assistantships), but due to inconsistencies this report analyzes only data on costs.

Despite these constraints, the F-1 visa approval data remain the best available indicator of the universe of full-time foreign students coming to study in the United States. Each F-1 student record in the database measures the number of foreign students on F-1 visas entering per year, comprising the flow of incoming F-1 foreign students.⁵⁷ This differs from a stock measure of the foreign student population, such as that estimated through survey tools by the Institute on International Education's annual *Open Doors* publication.⁵⁸

Restricting and Finalizing the Sample

The original data included F-1 visa approvals for all full-time students in all 50 states, the District of Columbia, Guam, Puerto Rico and the Virgin Islands for the 2001 to 2012 calendar year periods. For this analysis, F-1 approvals outside the 50 states and the District of Columbia and for students not studying in a bachelor's, master's, or doctoral degree program were eliminated.

This report further restricted the sample of metropolitan areas and the foreign student's hometown of origin used in the detailed analyses based on the number of F-1 visa approvals.

In order to examine metropolitan areas and global cities that have sufficient numbers of foreign students, the study restricts its sample to those areas with at least 1,500 F-1 visa approvals over the 2008 to 2012 period.⁵⁹ By focusing on the most recent five-year period, this report provides a current snapshot of foreign student trends. This process yields a final list of 118 U.S. high F-1 visa metropolitan areas and 94 global high F-1 source cities and hometowns. Many large U.S. metropolitan areas that do not have a major college or university had fewer than 1,500 F-1 approvals over the five-year period, including 30 of the 100 most populous metro areas.⁶⁰

The analysis focuses on foreign students pursuing bachelor's, master's and doctoral degrees (BMD) because most proposals to reform the immigration and visa system would target these students.

Optional Practical Training (OPT) Data

Through an additional FOIA request, data about foreign students on F-1 visas who received work authorization under the OPT program were obtained for 2008 to

2012. The data include information about the school, degree program and major for which the student used her or his F-1 visa. In addition, the data include information on the company or organization name, city and state at which the foreign student graduate is using the OPT for employment.

Key Terms

BMD is used in this paper as an acronym for bachelor's, master's and doctoral degree programs.

Carnegie Classification System is the standard system used in the United States to categorize higher educational institutions based on the highest degrees granted from the school: doctorate-granting, master's and bachelor's. The Carnegie system also classifies schools by the level of research activity at the institution and the size of the student population.⁶¹

The City Income Classification System used in this report comes from McKinsey and Company's "Global Cities of the Future" data.⁶² City income categories are based on gross domestic product (GDP) per capita: Very High Income (above \$50,000), High Income (between \$40,000 and \$50,000), Upper Middle Income (between \$25,000 and \$40,000), Middle Income (between \$15,000 and \$25,000), Low Income (between \$5,001 and \$15,000) and Very Low Income (below \$5,000).

Country Income Classification System used in this report comes from the World Bank Development Indicators that classify countries into groups based on gross national income (GNI) per capita and membership in the Organization for Economic Cooperation and Development (OECD). The countries in this report are classified into five categories: High-Income OECD (\$12,616 or more), High-Income Non-OECD (\$12,616 or more), Upper Middle Income (\$4,086-12,615), Lower Middle Income (\$1,036-\$4,085) and Lower Income (\$1,035 or less).⁶³

F-1 intensity is measured by the number of F-1 visas approved per 1,000 student population in the same category. For example, in the Seattle metropolitan area, the F-1

intensity of 50.1 for foreign students studying for a bachelor's or graduate degree is calculated by dividing the number of F-1 incoming visas approved (flow) for colleges and universities in the Seattle, Wash. metropolitan area by the total stock number of students (in thousands) pursuing a BMD degree in the metro area and taking the average for the 2008-2012 period. This means that there are 50.1 foreign students on F-1 visas entering the Seattle metro area per 1,000 students studying in the metro area.

Foreign Student is used interchangeably with F-1 visa approval throughout this report, unless otherwise stated.

High F-1 visa metropolitan areas are the 118 U.S. metro areas that are the focus of this analysis. These metro areas had at least 1,500 or more total F-1 visa approvals in the 2008-2012 period.

High F-1 source cities or hometowns are the 94 global cities that are the focus of this analysis. These cities also had at least 1,500 or more total F-1 visa approvals in the 2008-2012 period.

I-20 Form is a document that a Student Exchange and Visitor Program (SEVP)-approved school gives to foreign students once they have been formally admitted into a full-time program. Foreign students use one I-20 form for the school from which they accept an admissions offer. The student brings the school's I-20 form with her when applying for the visa at the U.S. consulate abroad and again when later arriving at the U.S. port of entry.

Science, technology, engineering and mathematics (STEM) fields of study are identified by the six-digit Classification of Instructional Programs (CIP) code provided in the I-20 forms.⁶⁴ This analysis uses the definition of STEM published by Immigration and Customs Enforcement (ICE), which includes over 400 fields of study.⁶⁵ The federal government has various definitions of STEM including the U.S. Department of Commerce definition based on "occupations" and the National Science Foundation's based on fields of study that include only "science and engineering." This study uses the ICE definition of STEM since that is the official definition used by the U.S. government for visa purposes for foreign students based on the fields of study. This definition of STEM excludes social science and medical fields that some experts consider to be STEM.

Student and Exchange Visitor Information System (SEVIS) is a database managed by the Immigration and Customs Enforcement (ICE). Information on all foreign students accepted into a U.S. school is entered into the SEVIS database.⁶⁶ Educational institutions are responsible for entering and updating foreign student information into SEVIS.

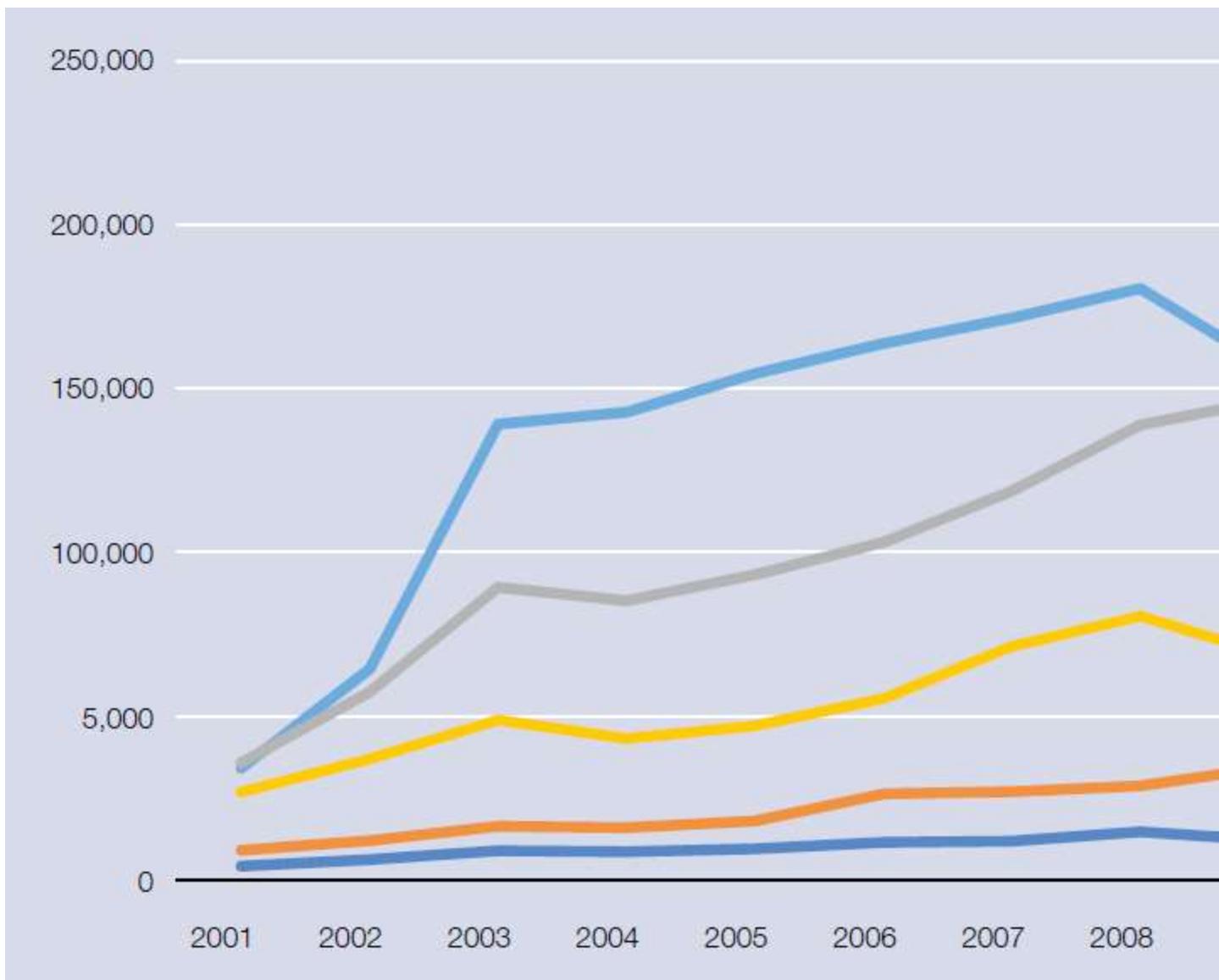
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FINDINGS

1. The number of foreign students on F-1 visas in U.S. colleges and universities grew dramatically from 110,000 in 2001 to 524,000 in 2012.

After a huge decline in foreign students entering the United States following the terrorist attacks on September 11, 2001, the number of foreign students on F-1 visas has grown tremendously, though with a minor decline during the recession.⁶⁷ Annual F-1 visa approvals averaged 360,000 from 2001 to 2012, fluctuating from a 2001 low of 123,000 to a 2012 high of 550,000.

Figure 2. F-1 Foreign Students by Country Type, 2001-2012



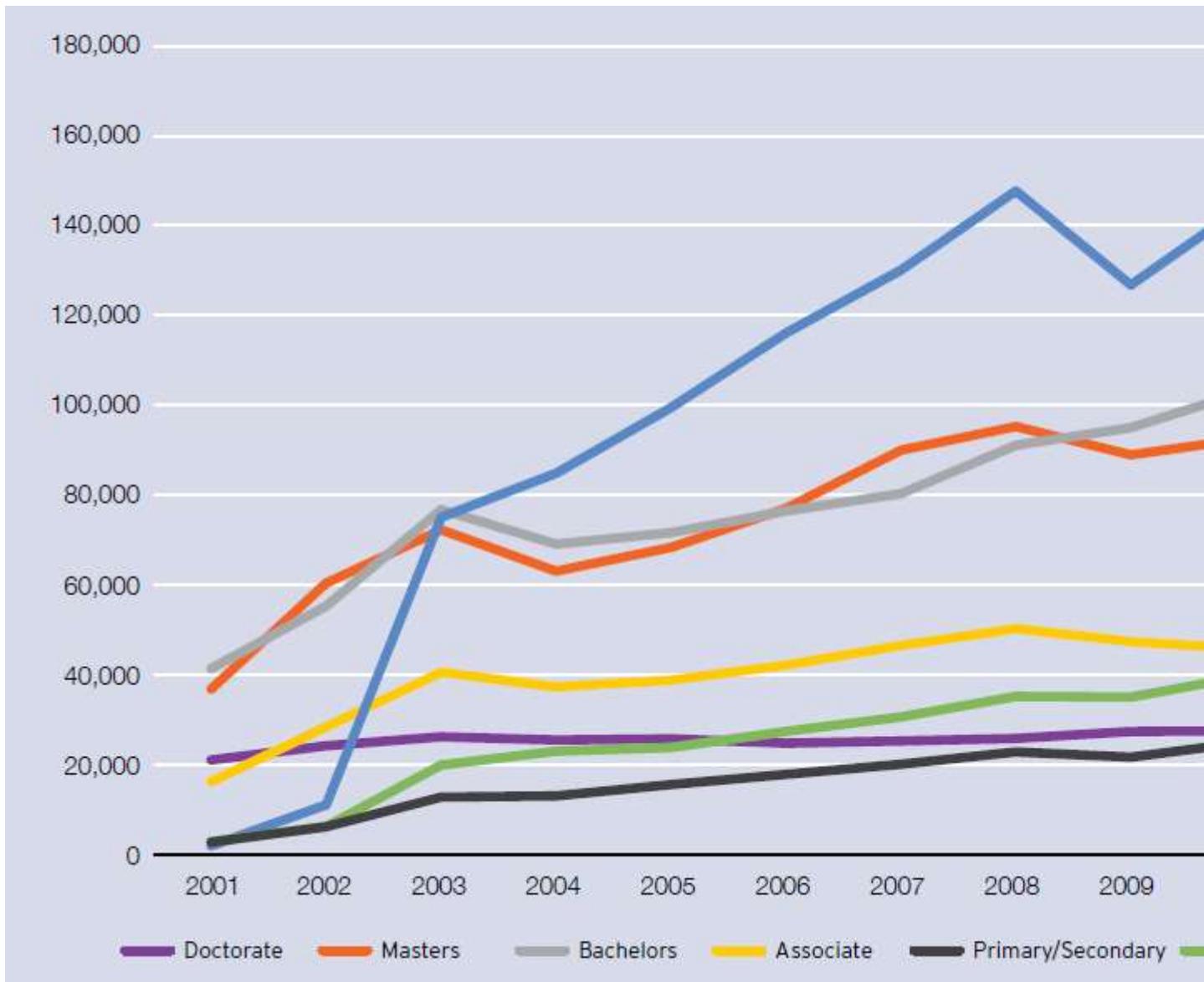
The largest growth of foreign students came from high-income non-OECD countries (Figure 2). Among these countries, the fastest rate of growth of foreign students came from the Middle East and North Africa with a 1,283 percent increase, from 5,500 students in 2001 to 75,000 in 2012.⁶⁸ During the same period, the East Asia and Pacific region (451 percent growth) and Europe and Central Asia (442 percent growth) also experienced

a large increase in their number of students studying in the United States.

From a degree perspective, the most significant growth occurred among foreign students pursuing language training, whose numbers mushroomed from fewer than 2,000 in 2001 to nearly 165,000 in 2012. A large number of this growth has to do with foreign students taking preparation courses for the Test of English as a Foreign Language (TOEFL), a required examination for entrance into U.S. colleges and universities.

Meanwhile, the number of foreign students pursuing BMD degrees grew rapidly as well, by more than 150,000 combined. Foreign doctoral students' numbers, by contrast, remained relatively steady throughout the 2001 to 2012 period. Across the more recent 2008 to 2012 period, there were 535,000 F-1 visa approvals for students pursuing a bachelor's degree, 480,000 F-1 visa students pursuing a master's degree and 135,000 pursuing doctoral degrees.

Figure 3. F-1 Foreign Students by Degree Type, 2001-2012



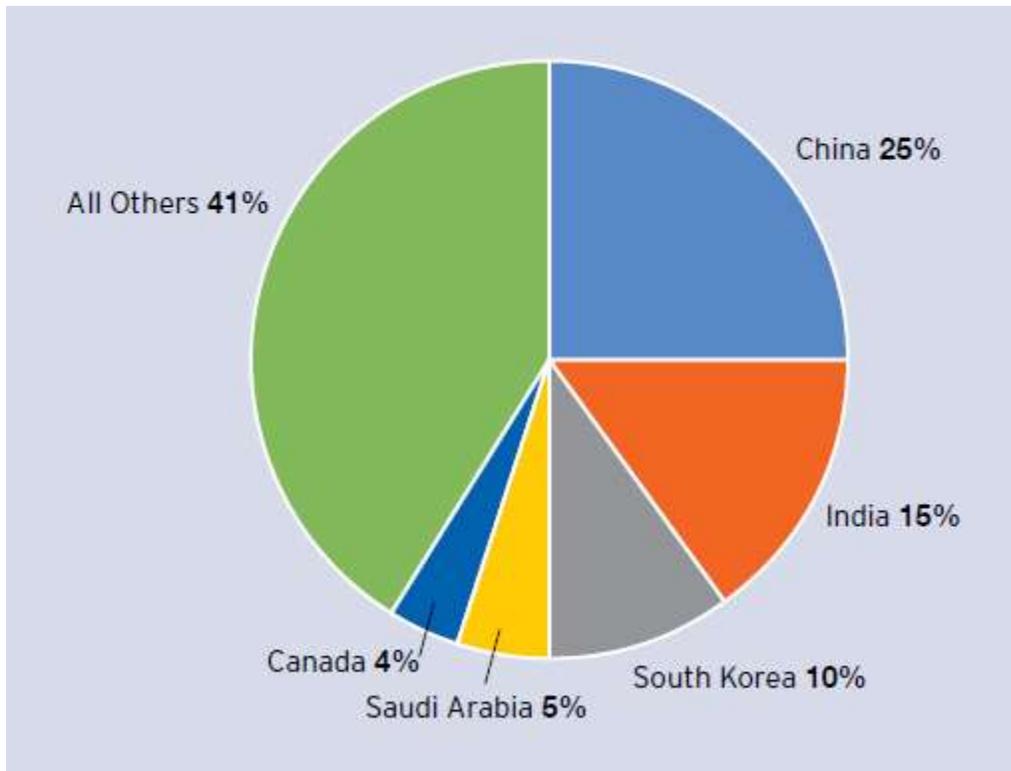
Funding

Over the 2001-2012 period, foreign students on F-1 visas paid \$56.5 billion in tuition fees and \$39.1 billion in living expenses to study in the United States.⁶⁹ Foreign students pursuing bachelor's and master's degrees contributed approximately 70 percent of that total.⁷⁰

Origin Countries

Countries that experienced rapid economic growth and instituted scholarship programs for studying abroad in the past decade have exhibited the fastest increases in their foreign student populations in the United States. From 2008 to 2012, 62 percent of all F-1 approvals originated from upper- and lower-middle-income countries, where gross national income per capita ranges from about \$1,000 to \$13,000 annually. The top countries sending foreign students to the United States during this period include China (25 percent of all approvals), India (15 percent), South Korea (10 percent) and Saudi Arabia (5 percent) (Figure 4). China's economy grew rapidly throughout this period, posting 7.8 percent GDP growth in 2012, while India experienced annual GDP growth fluctuations between 9.8 percent in 2007 and 3.2 percent in 2012.⁷¹ In the 1990s and 2000s, South Korea had one of the fastest-growing economies in the world and moved into the high-income category in 1997.⁷² Saudi Arabia, an oil-rich country, instituted a government scholarship program beginning in 2003 that today fully funds more than 45,000 students in the United States.⁷³

Figure 4. Top Countries of Citizenship of Foreign Students on F-1 Visas, 2008-2012



**All other countries have less than 4% share of F-1 visas*

Educational Institutions

From 2008 to 2012, approximately 7,200 U.S. educational institutions received approvals for F-1 visas. Almost 3,700 of these schools received F-1 approvals for BMD degree programs.⁷⁴ In the same five-year period, 61 percent of all incoming foreign students on F-1 visas pursuing at least a bachelor's degree attended a doctorate-granting university with very high- or high-research activity.⁷⁵ Only one-third of foreign students attended colleges or universities with little- to no-research activity.

Overall, a large number of foreign students concentrate in a relatively small number of colleges and universities. The top 100 schools accounted for 46 percent of all F-1 students pursuing at least a bachelor's degree. Sixty-two (62) of these institutions are doctoral-granting schools with very-high research activity. The top 25 schools in the same five-year period accounted for 20 percent of all approvals and included mostly doctorate-granting Carnegie institutions (Table 1). The schools with the most foreign students range from top private universities such as the University of Southern California, Columbia University and New York University, to land-grant and large public universities such as Purdue University, the University of Illinois and Ohio State University.

Table 1. Top 25 Educational Institutions with Foreign Students on F-1 visas studying for Bachelor's degree or higher, 2008-2012

RANK	EDUCATIONAL INSTITUTION	STUDENTS WITH F-1 VISAS	CARNEGIE CLASSIFICATION
1	University of Southern California	13,996	
2	Columbia University in the City of New York	13,434	

RANK	EDUCATIONAL INSTITUTION	STUDENTS WITH F-1 VISAS	CAP
3	University of Illinois	12,969	
4	New York University	11,609	
5	Purdue University	11,352	
6	The City University of New York	10,984	
7	Northeastern University	9,279	
8	University of Michigan	8,895	
9	University of Washington	8,509	
10	Indiana University	8,458	
11	Boston University	8,413	
12	The Ohio State University	8,402	
13	Michigan State University	8,344	
14	University of Minnesota	8,009	
15	University of California, Los Angeles	7,860	
16	State University of New York at Buffalo	7,756	

RANK	EDUCATIONAL INSTITUTION	STUDENTS WITH F-1 VISAS	CAR
17	Arizona State University	7,631	
18	The Pennsylvania State University	7,404	
19	Academy of Art University	7,165	
20	University of California at Berkeley	7,133	
21	Harvard University	7,112	
22	Cornell University	7,092	
23	University of Pennsylvania	7,084	
24	Carnegie Mellon University	6,856	
25	Illinois Institute of Technology	6,830	

**Carnegie Classifications Rank 1 universities are Doctoral-Granting with Very High-Research Activity. Rank 2 universities are Doctoral-Granting with High-Research Activity*

Fields of Study

The most popular major field for foreign students pursuing a BMD degree falls under business, management or marketing, with 30 percent of all students on F-1 visas from 2008 to 2012, compared to 21 percent overall enrollment in U.S. higher educational

schools.⁷⁶ Collectively, the STEM fields accounted for 37 percent of all F-1 visa approvals, compared to 27 percent overall. Within the STEM fields, engineering is the most popular major, followed by computer and information sciences and biological and biomedical sciences.

Business tends to be the most popular field of study among bachelor's and master's students, while STEM fields dominate among foreign students pursuing doctoral degrees (Table 2).

Table 2. Top 10 Majors by Degree Type for F-1 visas, 2008-2012

DEGREE TYPE		MAJOR FIELD OF STUDY	STUDENTS WITH F-1 VISAS	PERCENT OF STUD
Bachelor's	1	Business, Management, Marketing	173,372	
Bachelor's	2	Engineering	61,438	
Bachelor's	3	Liberal Arts And Sciences, General Studies	43,906	
Bachelor's	4	Social Sciences	37,422	
Bachelor's	5	Visual And Performing Arts	29,707	

DEGREE TYPE		MAJOR FIELD OF STUDY	STUDENTS WITH F-1 VISAS	PERCENT OF STUD
Bachelor's	6	Computer And Information Sciences	22,792	
Bachelor's	7	Biological And Biomedical Sciences	21,602	
Bachelor's	8	Health Professions And Related Programs	19,794	
Bachelor's	9	Communication, Journalism	15,193	
Bachelor's	10	Psychology	11,186	
Bachelor's		All Other Fields	98,182	
TOTAL			534,594	
Master's	1	Business, Management, Marketing	146,146	
Master's	2	Engineering	86,590	
Master's	3	Computer And Information Sciences	59,000	
Master's	4	Education	21,377	

DEGREE TYPE		MAJOR FIELD OF STUDY	STUDENTS WITH F-1 VISAS	PERCENT OF STUD
Master's	5	Health Professions And Related Programs	20,653	
Master's	6	Visual And Performing Arts	17,139	
Master's	7	Legal Professions And Studies	15,911	
Master's	8	Social Sciences	13,576	
Master's	9	Theology And Religious Vocations	10,962	
Master's	10	Biological And Biomedical Sciences	10,831	
Master's		All Other Fields	79,199	
TOTAL			481,384	
Doctorate	1	Engineering	38,201	
Doctorate	2	Physical Sciences	16,262	
Doctorate	3	Biological And Biomedical Sciences	13,766	

DEGREE TYPE		MAJOR FIELD OF STUDY	STUDENTS WITH F-1 VISAS	PERCENT OF STUD
Doctorate	4	Health Professions And Related Programs	10,620	
Doctorate	5	Social Sciences	8,329	
Doctorate	6	Computer And Information Sciences	8,199	
Doctorate	7	Mathematics And Statistics	5,935	
Doctorate	8	Business, Management, Marketing	5,237	
Doctorate	9	Education	4,278	
Doctorate	10	Theology And Religious Vocations	3,408	
		All Other Fields	23,246	
TOTAL			137,481	

2. Foreign students are concentrated in U.S. metropolitan areas.

A look beneath the national data reveals that F-1 visa approvals cluster heavily in certain metropolitan areas with high concentrations of colleges and universities. Every one of the nation's more than 350 metropolitan

areas registered at least one F-1 visa approval in the 2008-2012 period. However, 118 metro areas exhibited a high number (over 1,500 approvals), accounting for 85 percent of all F-1 visa approvals in that time period (Appendix B). This exceeded the 73 percent of U.S. enrollment in these metro areas for BMD degree programs.⁷⁷

Several very large metro areas exhibit a significant number of foreign students. The New York metropolitan area had by far the highest number of F-1 visa approvals: more than 100,000 over the 2008-2012 period, accounting for more than 8 percent of national F-1 approvals. Los Angeles, Boston, San Francisco and Washington made up the remaining top five metro areas, each with between 35,000 and 70,000 F-1 visa approvals. The 10 metro areas with the most F-1 visa approvals together accounted for 36 percent of all approvals; these metro areas also represent some of the largest by population (Table 3). All told, 70 of the 100 largest metropolitan areas had 1,500 or more F-1 visa approvals from 2008 to 2012.

Table 3. Top 20 Metropolitan Areas for F-1 Visas, 2008-2012

RANK	TOP METROPOLITAN AREA DESTINATIONS FOR F-1 STUDENTS 2008-2012	NUM STU
1	New York-Newark-Edison, NY-NJ-PA	1
2	Los Angeles-Long Beach-Santa Ana, CA	
3	Boston-Cambridge-Quincy, MA-NH	
4	San Francisco-Oakland-Fremont, CA	
5	Washington-Arlington-Alexandria, DC-VA-MD-WV	
6	Chicago-Naperville-Joliet, IL-IN-WI	
7	Dallas-Fort Worth-Arlington, TX	
8	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	
9	San Jose-Sunnyvale-Santa Clara, CA	
10	Miami-Fort Lauderdale-Pompano Beach, FL	
11	Atlanta-Sandy Springs-Marietta, GA	
12	Houston-Sugar Land-Baytown, TX	
13	San Diego-Carlsbad-San Marcos, CA	

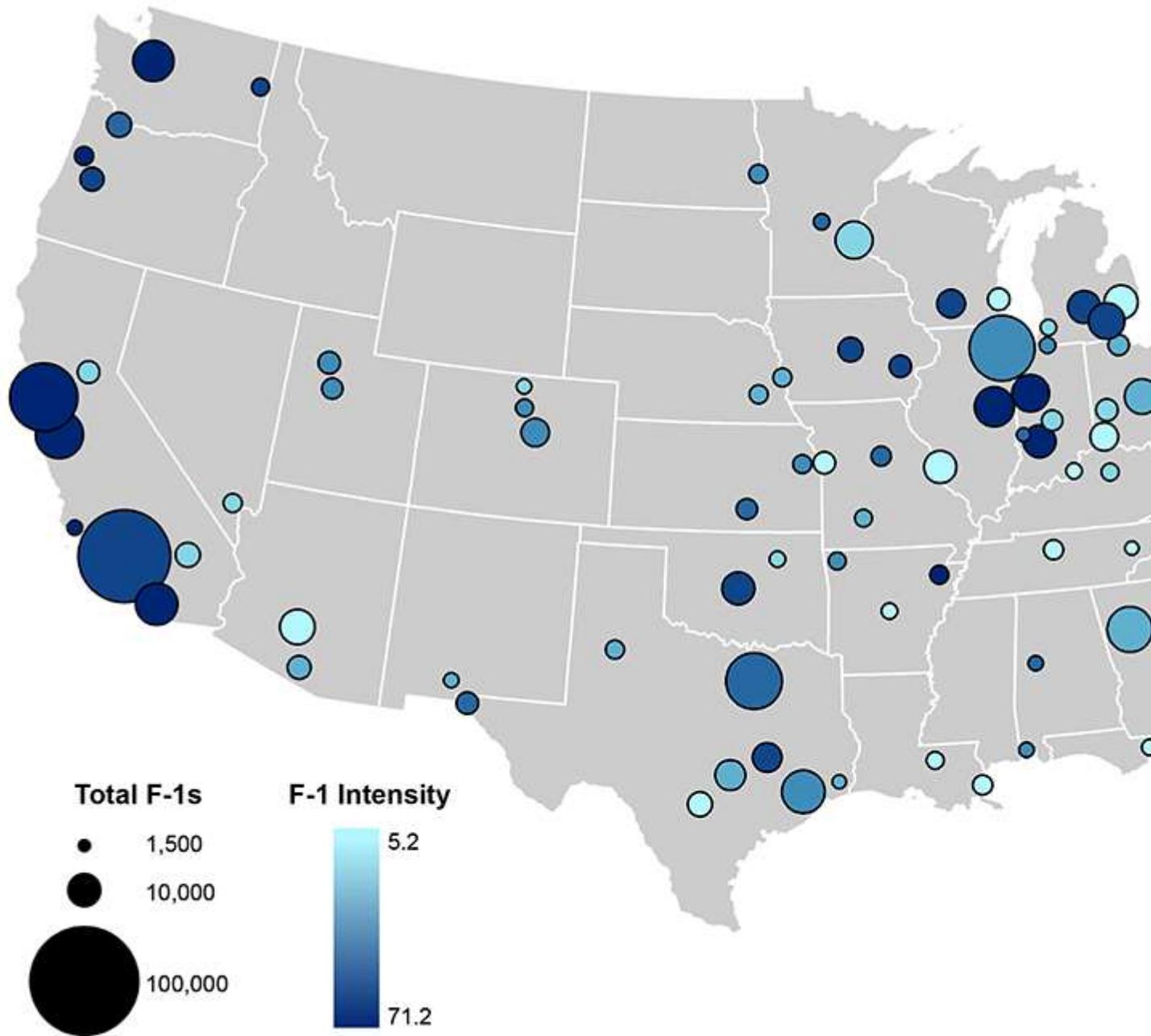
RANK	TOP METROPOLITAN AREA DESTINATIONS FOR F-1 STUDENTS 2008-2012	NUM STU
14	Buffalo-Niagara Falls, NY	
15	Pittsburgh, PA	
16	Seattle-Tacoma-Bellevue, WA	
17	Champaign-Urbana, IL	
18	Minneapolis-St. Paul-Bloomington, MN-WI	
19	Durham-Chapel Hill, NC	
20	Lafayette, IN	
	Top 20 Metros of Destination	5
	United States	1,3

**BMD Students Only*

As this statistic demonstrates, foreign students are not confined to large metropolitan areas, since many leading colleges and universities are located in smaller places. Champaign-Urbana, Ill. ranks 191st among metro areas for total population (just over 234,000 in 2012), but the presence of the University of Illinois

ranks the metro area 17th for incoming foreign students. Likewise, Lafayette, Ind., home of Purdue University, ranks 209th for total population but 20th for incoming F-1 visa holders.

Map 1. F-1 Visa Approvals and Intensity by Metropolitan Area, 2008-2012



Map is for the 118 metropolitan areas with at least 1,500 or more F-1 visa approvals

These and other smaller metropolitan areas tend to rank high in F-1 intensity; that is, the presence of foreign students among the broader student population in the metro area (Table 4 and Map 1). The Ithaca, N.Y. metro area—home of Cornell University with a

population of just over 100,000—exhibits the highest F-1 intensity, with 71.2 F-1 visa approvals per 1,000 students, compared to 22.4 for the nation as a whole. Only one of the top five metro areas for F-1 intensity—Boston—ranks among the 100 largest metro areas. In fact, 11 of the 20 metro areas ranking highest in F-1 intensity are smaller metro areas (in bold font in Table 4). These include several that are home to large universities: University of California at Santa Barbara in Santa Barbara, Calif.; Oregon State University in Corvallis, Ore.; Arkansas State University in Jonesboro, Ark.; University of Illinois in Champaign-Urbana.; and Purdue University in Lafayette.

Some large metro areas with multiple large universities also exhibit high F-1 intensity. Boston, MA, home to 85 colleges and universities, ranked second in F-1 intensity with 65.3 F-1 approvals per 1,000 students and third in total number of incoming foreign students with more than 53,000 for the 2008-2012 period.⁷⁸ San Francisco ranked sixth during that period with 38,000 F-1 approvals and 60.6 F-1 approvals per 1,000 students. On average, there were 24.9 incoming F-1 visa approvals per 1,000 students in the 118 metro areas, compared to 22.4 for the nation as a whole.

Table 4. Top 20 Metropolitan Areas for F-1 Visa Intensity, 2008-2012

RANK	GEOGRAPHY	NUMBER OF INTERNATIONAL STUDENTS
1	Ithaca, NY	7,300
2	Boston-Cambridge-Quincy, MA-NH	53,400
3	Santa Barbara-Santa Maria-Goleta, CA	1,800
4	Corvallis, OR	2,700
5	Jonesboro, AR	2,700
6	San Francisco-Oakland-Fremont, CA	37,600
7	Champaign-Urbana, IL	13,000
8	Lafayette, IN	11,300
9	Honolulu, HI	5,700
10	San Diego-Carlsbad-San Marcos, CA	14,000
11	Bloomington, IN	8,400
12	Seattle-Tacoma-Bellevue, WA	13,200

RANK	GEOGRAPHY	NUMBER OF INTERNATIONAL STUDENTS
13	Anderson, SC	2,300
14	Durham, NC	11,500
15	New York-New Jersey-Long Island, NY-NJ	101,500
16	San Jose-Sunnyvale-Santa Clara, CA	19,000
17	State College, PA	7,400
18	Los Angeles-Long Beach-Santa Ana, CA	68,200
19	Ames, IA	4,800
20	Ann Arbor, MI	10,400
	United States	1,153,400

**Intensity is measured as the number of foreign students per 1,000 students in the metropolitan area
 Bold font indicates metropolitan areas that are not among the 100 largest based on total population in 2012*

High Growth Foreign Student Metropolitan Areas

The five U.S. metropolitan areas experiencing the fastest increases in foreign students pursuing bachelor's, master's, or doctoral degrees over the 2008-2012 time period are Corvallis, Ore. (203 percent), Dayton, Ohio (202 percent), Tuscaloosa, Ala. (145 percent), Louisville, Ky. (125 percent) and Eugene-Springfield, Ore. (106 percent). Each of these is a small to mid-sized metro area home to a large public university, namely Oregon State University (Corvallis), Wright State University (Dayton), University of Alabama (Tuscaloosa), University of Louisville (Louisville) and University of Oregon

(Eugene-Springfield). The top hometowns for foreign students in these metropolitan areas are respectively Riyadh, Riyadh, Beijing, Hyderabad and Beijing.

Foreign students constitute a large source of export earnings for U.S. metropolitan economies. This is especially true for students pursuing bachelor's degrees, who mostly pay full tuition from personal sources and pay higher tuition costs at public universities than in-state students.⁷⁹ Over the 2008 to 2012 period, foreign students on F-1 visas studying for BMD degrees paid about \$35 billion in tuition and living expenses in the 118 high F-1 U.S. metropolitan areas. The New York metro area ranked first for total tuition (\$2.6 billion) and living expenses (\$1.6 billion) received from its 102,000 foreign students.⁸⁰

Average foreign student spending in a metropolitan area reflects both the cost of the educational institution as well as the places from where the students originate. On average, foreign students studying in the high F-1 metro areas had annual total educational spending of \$36,000. Ithaca, N.Y., Boston, Mass. and Ann Arbor, Mich. (home to the University of Michigan) had the highest costs paid by F-1 students, at more than \$50,000 each (Table 5). On the other end of the continuum, metro areas with the lowest average costs were El Paso, Tex, Las Cruces, N.M. and Provo-Orem, Utah. The University of Texas at El Paso had an

average total cost of \$12,000 per foreign student, with less than \$5,000 coming from tuition since many foreign students from Mexico can qualify to pay in-state tuition through the Programa de Asistencia Estudiantil program.⁸¹

Table 5. Highest and Lowest Average Tuition Paid by U.S. Metro, 2008-2012

HIGHEST AVERAGE TOTAL SPENDING				
RANK	METROPOLITAN AREA	AVERAGE TOTAL COSTS	AVERAGE TUITION	
1	Ithaca, NY	\$58,085	\$38,300	
2	Boston-Cambridge-Quincy, MA-NH	\$50,529	\$33,090	
3	Ann Arbor, MI	\$50,244	\$34,081	
4	Trenton-Ewing, NJ	\$50,224	\$33,721	
5	Champaign-Urbana, IL	\$48,334	\$32,890	
6	Rochester, NY	\$47,731	\$35,693	
7	Charlottesville, VA	\$47,083	\$32,627	
8	Pittsburgh, PA	\$47,017	\$33,310	

HIGHEST AVERAGE TOTAL SPENDING

RANK	METROPOLITAN AREA	AVERAGE TOTAL COSTS	AVERAGE TUITION	
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9	New Haven-Milford, CT	\$45,345	\$29,594	
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10	Springfield, MA	\$44,045	\$30,137	
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LOWEST AVERAGE TOTAL SPENDING

RANK	METROPOLITAN AREA	AVERAGE TOTAL COSTS	AVERAGE TUITION	
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118	El Paso, TX	\$11,676	\$4,694	
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117	Las Cruces, NM	\$15,762	\$9,621	
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116	Provo-Orem, UT	\$16,470	\$7,167	
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115	Lubbock, TX	\$17,401	\$8,339	
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114	Jonesboro, AR	\$17,445	\$11,461	
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113	Spokane, WA	\$18,023	\$12,170	
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112	Mobile, AL	\$18,775	\$11,976	
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111	Little Rock-North Little Rock-Conway, AR	\$19,015	\$12,575	
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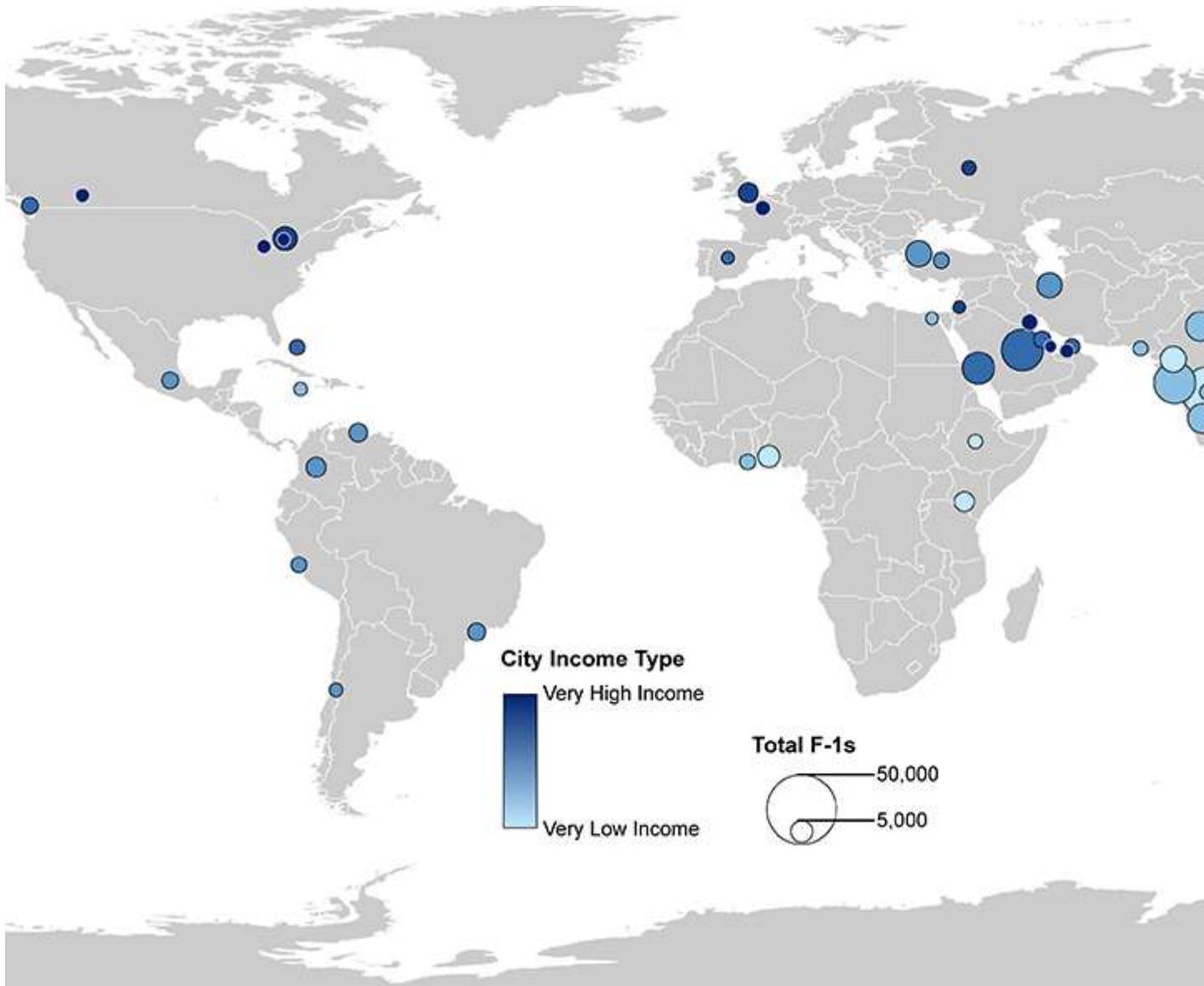
LOWEST AVERAGE TOTAL SPENDING				
RANK	METROPOLITAN AREA	AVERAGE TOTAL COSTS	AVERAGE TUITION	
110	Baton Rouge, LA	\$19,473	\$8,555	
109	Detroit-Warren-Livonia, MI	\$21,115	\$13,493	

All figures in \$US, for Bachelor's or higher degrees in the 2008-2012 period

3. Most foreign students come from large fast-growing cities in emerging markets

Metropolitan geography is an important feature not only of where foreign students locate in the United States, but also of where they originate worldwide. From 2008 to 2012, 94 cities abroad registered as significant sources of foreign students in the United States (with over 1,500 students), together sending 575,000 students and accounting for 51 percent of all F-1 approvals (See Appendix C for data on 94 source cities or click "Data" above for data on top fields of study and percentage in STEM fields by global hometown of origin).⁸²

Map 2. Global Hometowns of Foreign Students, 2008-2012



Source: SEVIS, Immigration and Customs Enforcement and McKinsey Global Cities of the Future.

For thresholds for city size and city income type see appendix A. Includes only foreign students studying for Bachelor's or higher degrees

RANK	CITY	NUMBER OF STUDENTS	SHARE	CITY SIZE	CITY INCOME TYPE
1	Seoul, South Korea	56,503	4.9%	Large	Very High Income

RANK	CITY	NUMBER OF STUDENTS	SHARE	CITY SIZE	C
2	Beijing, China	49,946	4.3%	Megacity	
3	Shanghai, China	29,145	2.5%	Megacity	
4	Hyderabad, India	26,220	2.3%	Large	
5	Riyadh, Saudi Arabia	17,361	1.5%	Large	Up
6	Mumbai, India	17,294	1.5%	Megacity	
7	Taipei, Taiwan	15,985	1.4%	Large	
8	Hong Kong, SAR	12,406	1.1%	Large	
9	Kathmandu, Nepal	10,721	0.9%	Small	
10	Jeddah, Saudi Arabia	10,468	0.9%	Middle	
11	Nanjing, China	9,316	0.8%	Large	
12	Chennai, India	9,141	0.8%	Large	
13	Singapore	8,989	0.8%	Large	
14	Bangalore, India	8,835	0.8%	Large	
15	Delhi, India	8,728	0.8%	Megacity	

RANK	CITY	NUMBER OF STUDENTS	SHARE	CITY SIZE	C
16	Guangzhou, China	8,167	0.7%	Megacity	
17	Chengdu, China	8,124	0.7%	Large	
18	Wuhan, China	8,001	0.7%	Large	
19	Ho Chi Minh City, Vietnam	7,955	0.7%	Large	
20	Shenzhen, China	7,792	0.7%	Megacity	
	World	1,153,459	100.0%		

The large majority of foreign students from these 94 cities have ties to potentially large consumer and investment markets. Seventy-five (75) percent of foreign students come from places with populations of 5 million or more (Map 2).⁸³ Only 11 percent of F-1 students came from small cities with populations under 2.5 million and 13 percent from middle-sized cities with populations between 2.5 and 5 million.⁸⁴

Large Asian cities dominate the list of largest home markets for U.S. foreign students. Seoul (South Korea) sent more BMD F-1 students than any other city: more than 56,000 students over the 2008-2012 period, accounting for almost 5 percent of all such students.

Beijing (China), Shanghai (China), Hyderabad (India) and Riyadh (Saudi Arabia) made up the other top five global cities, each sending between 17,000 and 50,000 students to the United States. Nineteen (19) of the top 20 source cities of foreign students were large or megacities in 2010. The one exception is Kathmandu (Nepal), which despite a population of just 700,000 sent more than 10,700 students to the United States from 2008 to 2012, ranking it seventh overall.

Most foreign students also come from cities that could be classified as economically emerging. Just over 73 percent of F-1 visa approvals from the 94 high F-1 source cities were from low-, middle- and upper-middle income cities with GDP per capita between US\$6,000 and \$40,000.⁸⁵ Three of the top 20 source cities are actually very low income cities with GDP per capita at or below US\$5,000. For example, Hyderabad (India) ranked fourth with more than 26,000 BMD degree students despite ranking 88th on GDP per capita (\$5,000). Kathmandu (Nepal) and Chennai (India) are the remaining two cities among the top 20 source hometowns with GDP per capita below \$5,000. Nonetheless, McKinsey projects that many of these lower-income cities will experience rapid economic growth in the coming decade.⁸⁶

China: The Largest Source Country for Foreign Students in the United States

With nearly 285,000 foreign students entering on an F-1 visa during the 2008-2012 period, China is the source of the largest number of foreign students to the United States. The top higher education institutions for Chinese students during this period are Purdue University (5,600), University of Illinois (5,400), Michigan State University (4,700), University of Southern California (4,700) and Ohio State University (4,500). The most popular degree program for Chinese BMD students in the 2008-2012 time period was business (35 percent of all Chinese BMD students in 2008-2012), followed by engineering (17 percent) and social sciences (6 percent). The hometowns of most Chinese students entering the U.S. in the 2008-2012 period are Beijing (50,000), Shanghai (29,100), Nanjing (9,300) and Guangzhou (8,200). The bulk of Chinese STEM degree students come from Beijing, Shanghai, Nanjing and Wuhan.

High Growth Foreign Student Hometowns

Four of the top five foreign cities seeing the highest growth in foreign students pursuing bachelor's, master's, or doctoral degrees in the United States over the 2008-2012 time period were in Saudi Arabia, including Jeddah (360 percent increase), Dammam (302 percent increase), Riyadh (279 percent) and Qatif (264 percent). Ningbo, China rounded out the top five, increasing by 252 percent. Foreign students coming from these cities are primarily studying business and engineering. Students pursuing a degree in business management accounted for 33 percent of BMD students from these five cities for the time period. Students pursuing engineering degrees accounted for another 19 percent. The top five schools for foreign students from these cities include California State University at Northridge, the University of Texas at San Antonio, Indiana University, The University of Tennessee at Martin and Arkansas State University. The King Abdullah Scholarship program developed by the Saudi Arabian government explains the rapid increase of Saudi Arabian students studying in the United States.

[Click here](#) for more information about the King Abdullah Scholarship Program.

Seoul: The Largest Source City for Foreign Students in the United States

Sending 56,500 students during the 2008-2012 period, Seoul is the number one source city of foreign students in the United States. The top five higher education institutions where students from Seoul enroll are University of Illinois (1,700), Indiana University (1,200), New York University (1,200), University of Southern California (900) and The City University of New York (900). The most popular majors for BMD students from Seoul are business (12,500), visual and performing arts (6,300), engineering (4,600), social sciences (4,400) and theology and religious vocations (4,100). The top U.S. metropolitan destinations of F-1 students from Seoul are Los Angeles (7,100), New York (6,700), Boston (2,100), San Francisco (2,000) and Atlanta (1,700). Seoul ranked first for both the total tuition (\$1.3 billion) and estimated living costs (\$781 million) spent.

Foreign students bring financial resources from their hometown communities to U.S. metropolitan areas to attend school. Foreign students from middle-, low- and upper middle-income cities accounted for 77 percent of the total educational expenses from F-1 students studying for a BMD degree in U.S. metropolitan areas. Seoul, an upper middle income city, contributed the most tuition dollars (\$1.3 billion) and living expenses (\$781.7 million) from 56,500 students over the 2008-2012 period. Over the same five-year period, Beijing, Shanghai, Mumbai and Hyderabad made up the remaining top five cities, each contributing between \$650 million and \$2.0 billion in total educational spending (Table 6).

Table 6. Top 10 Highest Foreign Student Educational Spending by Global Source City, 2008-2012

HIGHEST FOREIGN STUDENT SOURCE CITY SPENDING					
RANK	SOURCE CITY	TOTAL SPENDING	TOTAL TUITION	LIVING EXPENSES	GLOBAL C
1	Seoul	\$2,119,192,671	\$1,337,474,314	\$781,718,357	Upper
2	Beijing	\$2,004,075,571	\$1,295,268,804	\$708,806,767	
3	Shanghai	\$1,190,042,931	\$776,728,069	\$413,314,862	
4	Mumbai	\$654,877,275	\$411,991,957	\$242,885,318	
5	Hyderabad	\$645,598,871	\$373,163,268	\$272,435,603	Ver
6	Taipei	\$608,071,548	\$379,706,098	\$228,365,450	
7	Riyadh	\$517,431,742	\$331,284,455	\$186,147,287	Upper
8	Hong Kong	\$514,060,428	\$336,187,085	\$177,873,343	
9	Singapore	\$381,292,013	\$254,730,015	\$126,561,998	Ver
10	Nanjing	\$367,029,987	\$237,297,717	\$129,732,270	

All figures in \$US, for Bachelor's or higher degrees in the 2008-2012 period

4. Foreign students disproportionately study STEM and business fields

Technological innovation and the development of new businesses require expertise in science, technology, engineering and mathematics (STEM) and management.⁸⁷ In the United States, studies have shown that job openings in the STEM fields are difficult to fill.⁸⁸ As discussed above, 37 percent of all incoming foreign students were studying toward a BMD degree in the science, technology, engineering or mathematics (STEM) fields. Foreign STEM graduates of U.S. higher educational institutions can play a critical role in filling STEM occupational needs in U.S. metro economies. Meanwhile, business, management or marketing (30 percent) is the single most popular major among foreign students.

Foreign STEM students tend to locate in U.S. metro areas that are either STEM-heavy economies, or are home to STEM-specialized institutions of higher education. Some metro areas have industries demanding a large number of STEM educated graduates such as San Jose, CA (62 percent of foreign students studying STEM). Others such as Lafayette, IN (64 percent), are home to STEM-focused institutions like Purdue University (Table 8). The large majority of foreign BMD STEM students (72 percent) study at the 207 doctoral-granting U.S. universities with high- or very-high research activity and their metropolitan

geography reflects in part the geography of those institutions.⁸⁹ Large, economically diverse metro areas such as New York (31,800), Los Angeles (20,200) and Boston (14,200) attract the most foreign STEM students in absolute numbers since they house many research universities.

Purdue University: A Significant Destination for Foreign STEM Students

Purdue is a land grant doctorate-granting university with very high research activity located in the Lafayette, Ind. metropolitan area. The school is the number one destination for Chinese foreign students (5,600), mostly coming from Beijing, Shanghai and Nanjing. Purdue also ranks first for the number of foreign students in both bachelor's and doctoral degree programs. Lower tuition costs and highly-ranked engineering programs attract a large number of STEM foreign students. Over 63 percent of the 11,400 F-1 students that entered Purdue during the 2008-2012 period are pursuing STEM degrees. In fact, in the fall 2013 semester, the majority of graduate students at both the College of Engineering and the College of Science were international.

Source: Purdue University, Office of International Students and Scholars and Immigration and Customs Enforcement

Many smaller metro areas with universities specializing in STEM disciplines exhibit particularly high shares of foreign students in those fields. In 31 of the 118 high F-1 visa U.S. metro areas, foreign students pursuing STEM degrees accounted for at least half of all incoming F-1 students. The Beaumont-Port Arthur, Texas metro area has the highest share of its foreign students pursuing a STEM degree, due largely to

Lamar University, a doctorate-granting university with some research activity. More than 80 percent of its 1,680 F-1 students study for a STEM degree and most of them (57 percent) hail from India.⁹⁰ Other metros with high shares of their foreign students studying STEM include Palm Bay, Fla. (78 percent), home to Florida Institute of Technology and Anderson, S.C. (74 percent), home to Clemson University (Table 7).

Table 7. Top 10 Metro Destinations for STEM Students Pursuing Bachelor’s Degrees or Higher, 2008-2012

TOP 10 STEM METRO DESTINATIONS AS PERCENTAGE OF TOTAL F-1 STUDENTS			
RANK	U.S. METROPOLITAN AREA	NUMBER OF STEM F-1S	NUMBER OF
1	Beaumont-Port Arthur, TX	1,364	
2	Palm Bay-Melbourne-Titusville, FL	1,904	
3	Anderson, SC	1,699	
4	College Station-Bryan, TX	4,895	
5	Blacksburg-Christiansburg-Radford, VA	2,333	
6	Las Cruces, NM	1255	

TOP 10 STEM METRO DESTINATIONS AS PERCENTAGE OF TOTAL F-1 STUDENTS

RANK	U.S. METROPOLITAN AREA	NUMBER OF STEM F-1S	NUMBER OF
7	Gainesville, FL	4,587	
8	Dayton, OH	2,496	
9	Lafayette, IN	7,279	1
10	Corvallis, OR	1,741	

TOP 10 STEM METRO DESTINATION AS TOTAL F-1 STUDENTS

RANK	U.S. METROPOLITAN AREA	NUMBER OF STEM F-1S	NUMBER OF
1	New York-Newark-Edison, NY-NJ-PA	31,809	10
2	Los Angeles-Long Beach-Santa Ana, CA	20,170	6
3	Boston-Cambridge-Quincy, MA-NH	14,220	5
4	San Francisco-Oakland-Fremont, CA	9,478	3
5	Washington-Arlington-Alexandria, DC-VA-MD-WV	12,758	3
6	Chicago-Naperville-Joliet, IL-IN-WI	12,914	3
7	Dallas-Fort Worth-Arlington, TX	10,985	2

TOP 10 STEM METRO DESTINATION AS TOTAL F-1 STUDENTS			
RANK	U.S. METROPOLITAN AREA	NUMBER OF STEM F-1S	NUMBER OF TOTAL F-1S
8	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	7,932	20,111
9	San Jose-Sunnyvale-Santa Clara, CA	11,749	20,111
10	Miami-Fort Lauderdale-Pompano Beach, FL	3,611	20,111
	High Foreign Student Metros	362,459	99,000

As is the case with STEM, large metropolitan areas also attract the majority of foreign students pursuing a business, management or marketing degree (Table 8). By contrast, metro areas with the highest shares of their foreign students pursuing a business degree tend to have specialized business or management schools. Manchester, N.H. (71 percent), home of Southern New Hampshire University, has the highest share of its F-1 visa students majoring in business, especially at the master’s level. Las Vegas, Nev. (66 percent), for its part, has a world-renowned hospitality school where the large majority of foreign students attend to study hotel management.

Table 8. Top 10 Metro Destinations for Business, Management, or Marketing

Students Pursuing Bachelor's Degrees or Higher, 2008-2012

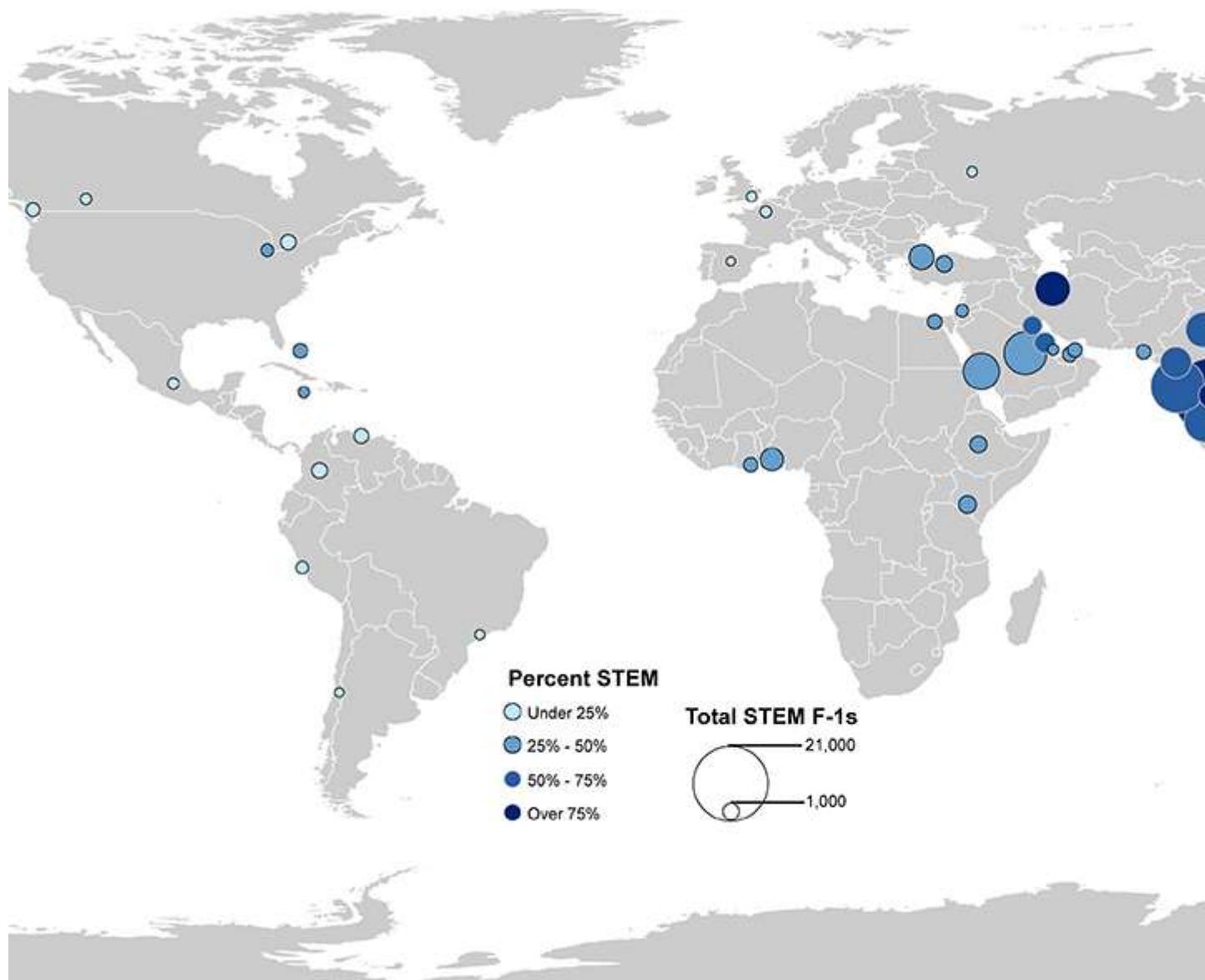
TOP 10 BUSINESS METRO DESTINATIONS AS PERCENTAGE OF TOTAL F-1 STUDENTS			
RANK	U.S. METROPOLITAN AREA	NUMBER OF BUSINESS F-1S	NUMBER OF F-1S
1	Manchester-Nashua, NH	1,481	2,10
2	Las Vegas-Paradise, NV	1,876	2,85
3	Springfield, MO	1,556	2,54
4	Jonesboro, AR	1,340	2,70
5	Tampa-St. Petersburg-Clearwater, FL	2,627	5,47
6	Tuscaloosa, AL	911	1,97
7	Providence-New Bedford-Fall River, RI-MA	3,957	8,73
8	San Diego-Carlsbad-San Marcos, CA	5,749	14,00
9	Miami-Fort Lauderdale-Pompano Beach, FL	7,627	18,67
10	Bloomington, IN	3,392	8,40

TOP 10 BUSINESS METRO DESTINATION AS TOTAL F-1 STUDENTS			
RANK	U.S. METROPOLITAN AREA	NUMBER OF BUSINESS F-1S	NUMBER OF F-1S
1	New York-Newark-Edison, NY-NJ-PA	25,039	101,500
2	Los Angeles-Long Beach-Santa Ana, CA	20,627	68,200
3	Boston-Cambridge-Quincy, MA-NH	17,130	53,400
4	San Francisco-Oakland-Fremont, CA	12,669	37,600
5	Chicago-Naperville-Joliet, IL-IN-WI	10,863	35,200
6	Washington-Arlington-Alexandria, DC-VA-MD-WV	10,656	35,400
7	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	8,586	24,300
8	Dallas-Fort Worth-Arlington, TX	8,513	25,300
9	Miami-Fort Lauderdale-Pompano Beach, FL	7,627	18,600
10	San Diego-Carlsbad-San Marcos, CA	5,749	14,000
	High Foreign Student Metros	261,629	957,800

The home countries and cities of foreign students in STEM and business fields include many fast-growing

and professionalizing economies in Asia. Among foreign STEM students, 31 percent are from China, 27 percent from India and 5 percent from South Korea. Hyderabad is the top source city of foreign STEM students in the United States (see box) and India accounts for eight of the 10 origin cities with the highest shares of their F-1 students in STEM fields. Many of these places (e.g., Chennai, Pune, Bangalore) are emerging hubs of the global IT industry. Among foreign students pursuing business degrees, Beijing, Seoul, Shanghai, Riyadh and Taipei are the predominant source cities, while smaller but fast-growing Asian cities (Ulan Bator, Hanoi, Ningbo) exhibit the highest shares of their students in that field (Table 9).

Map 3. Global Hometowns of STEM Foreign Students by Number and Intensity



TOP 10 STEM SOURCE CITIES AS PERCENTAGE OF TOTAL F-1 STUDENTS			
RANK	GLOBAL CITY	NUMBER OF STEM F-1S	NUMBER OF F-1S
1	Vijayawada, India	1,867	2,100
2	Visakhapatnam, India	1,482	1,800

TOP 10 STEM SOURCE CITIES AS PERCENTAGE OF TOTAL F-1 STUDENTS

RANK	GLOBAL CITY	NUMBER OF STEM F-1S	NUMBER OF F-1S
3	Chennai, India	7,342	9,111
4	Hyderabad, India	20,840	26,220
5	Secunderabad, India	2,333	2,944
6	Pune, India	4,270	5,503
7	Tehran, Iran	4,668	6,111
8	Bangalore, India	6,470	8,311
9	Kolkata, India	2,570	3,311
10	Dhaka, Bangladesh	2,179	3,444

TOP 10 STEM SOURCE CITIES AS TOTAL F-1 STUDENTS

RANK	GLOBAL CITY	NUMBER OF STEM F-1S	NUMBER OF F-1 S
1	Hyderabad, India	20,840	26,220
2	Beijing, China	19,605	49,946
3	Seoul, South Korea	11,628	56,503

TOP 10 STEM SOURCE CITIES AS TOTAL F-1 STUDENTS			
RANK	GLOBAL CITY	NUMBER OF STEM F-1S	NUMBER OF F-1 S
4	Shanghai, China	10,768	29,145
5	Mumbai, India	10,638	17,294
6	Chennai, India	7,342	9,141
7	Riyadh, Saudi Arabia	6,817	17,361
8	Bangalore, India	6,470	8,835
9	Jeddah, Saudi Arabia	4,933	10,468
10	Taipei, Taiwan	4,802	15,985
	High F-1 Source Cities	228,491	573,441
	World	426,505	1,153,459

The Top Source of STEM Foreign Students: Hyderabad, India

Hyderabad, India, sent the largest number of STEM students (20,800) to the United States and ranked fourth for the percentage of its students pursuing a STEM degree (80 percent) during the 2008-2012 period. Notably, 91 percent of students from Hyderabad are studying for a master's degree, versus only 4 percent for a bachelor's degree. The vast majority were studying for computer and information sciences (9,100) and engineering (8,800) degrees. The top five destination schools of F-1 students from Hyderabad are institutions with no major research activity under the Carnegie

classification system. The largest is International Technological University (ITU), a non-profit accredited Master's Medium-Sized College with no research activity. Other top destination schools of foreign students from Hyderabad include for-profit Master's Small and Larger Programs such as University of Northern Virginia (unaccredited and shut down by Department of Homeland Security (DHS)), Stratford University (accredited), Tri- Valley University (unaccredited and shut down by DHS) and Herguan University (unaccredited). Some of these schools have been closed down because they were abusing the F-1 visa system and the Curricular Practical Training (CPT) program to bring students to work for employers, rather than primarily to study for a degree program. But despite dominating a large proportion of Indian students from Hyderabad, Carnegie-classified Masters Colleges overall make up between only 1.1 percent (Smaller Programs) to 16.5 percent (Larger Programs) of all STEM F-1 students.

For more information read David North, "[All College Student \(F-1\) Visa Fraud Comes in Three Parts](#)".

Table 9. Top 10 Source Cities of Foreign Business, Management, or Marketing Students Pursuing Bachelor's Degrees or Higher, 2008-2012

TOP 10 BUSINESS SOURCE CITIES AS PERCENTAGE OF TOTAL F-1 STUDENTS			
RANK	GLOBAL CITY	NUMBER OF BUSINESS F-1S	NUMBER OF F-1 S
1	Ulaanbaatar, Mongolia	1,800	2,761
2	Hanoi, Vietnam	1,878	3,776
3	Ho Chi Minh City, Vietnam	3,932	7,955
4	Ningbo, China	1,153	2,419

TOP 10 BUSINESS SOURCE CITIES AS PERCENTAGE OF TOTAL F-1 STUDENTS

RANK	GLOBAL CITY	NUMBER OF BUSINESS F-1S	NUMBER OF F-1 S
5	Dalian, China	2,538	6,113
6	Fuzhou, China	721	1,749
7	Sao Paulo, Brazil	1,326	3,305
8	Bangkok, Thailand	2,812	7,015
9	Jakarta, Indonesia	2,190	5,480
10	Moscow, Russia	805	2,055

TOP 10 BUSINESS SOURCE CITIES AS TOTAL F-1 STUDENTS

RANK	GLOBAL CITY	NUMBER OF BUSINESS F-1S	NUMBER OF F-1 S
1	Beijing, China	15,382	49,946
2	Seoul, South Korea	12,509	56,503
3	Shanghai, China	10,364	29,145
4	Riyadh, Saudi Arabia	6,521	17,361
5	Taipei, Taiwan	5,411	15,985

TOP 10 BUSINESS SOURCE CITIES AS TOTAL F-1 STUDENTS			
RANK	GLOBAL CITY	NUMBER OF BUSINESS F-1S	NUMBER OF F-1 S
6	Hyderabad, India	3,989	26,220
7	Ho Chi Minh City, Vietnam	3,932	7,955
8	Kathmandu, Nepal	3,844	10,721
9	Mumbai, India	3,738	17,294
10	Hong Kong, SAR	3,710	12,406
	High F-1 Source Cities	163,151	573,441
	World	324,755	1,153,459

5. Forty-five (45) percent of foreign student graduates extend their visas to work in the same metropolitan area as their college/university.

Retaining foreign students after they graduate is a hot topic among leaders in Washington, DC, state capitals and cities across the country. Yet there remains little understanding that many foreign students do work in the United States after graduating, at least

temporarily and even less awareness of where they work post-graduation.

Currently, the Optional Practical Training (OPT) program can authorize foreign students on F-1 visas to work between 12 to 29 months after they graduate from a U.S. higher educational institution.⁹¹ There are no caps on the number of foreign students on F-1 visas that can gain work authorization under the OPT program after they graduate, but the student must apply for the OPT through their school before they graduate (see background section for a more detailed explanation). During the 2008 to 2012 period, there were roughly 375,000 OPTs, an average of 75,000 per year, granted in the United States for foreign students receiving BMD degree. Given the average of 230,000 F-1s approved annually from 2008 to 2012, this implies that roughly one out of every three foreign students approved to study in the United States ultimately uses the OPT program.

As metropolitan leaders consider the potential role of foreign students in their regional economies, the extent to which these students remain in the area for OPT is an important consideration. Across the 118 high foreign student metros, fully 45 percent of foreign students using the OPT program stayed in their school's

metropolitan area to work after graduating with a BMD degree for the 2008-2012 period.⁹²

Not surprisingly, metro areas vary in the share of foreign students they retain under the OPT program. Metro size and industry clusters help determine the extent to which foreign student graduates pursue local employment under the program. The New York metro area, the nation's largest, has the highest number (16,000) and percentage (75 percent) of its OPT foreign graduates remaining to work for a New York-based employer. Other metro areas exhibiting high percentages include Honolulu, Hawaii (75 percent), Seattle, Wash. (74 percent), Miami, Fla. (70 percent) and Las Vegas, Nev. (67 percent). Both Honolulu and Las Vegas have very large tourism and hospitality industries that attract many foreign students from Asia. The University of Honolulu at Manoa (900 OPTs), Hawaii Pacific University (560) and University of Nevada, Las Vegas (1,130) have world-renowned hospitality schools from which the majority of OPTs gain temporary employment at large hotels and travel-oriented companies. In the Seattle area, large numbers of foreign student graduates from the University of Washington (1,960) and Seattle University (460) use their OPT to work for information technology and software companies located in the region.

Table 10. Highest and Lowest 10 Metropolitan Areas Retaining Foreign Students on Optional Practical Training (OPT) Program, 2008-2012

RANK	METROPOLITAN AREA	NUMBER OF OPT EMPLOYED IN METRO	NUMBER OF OPT EMPLOYED	PERCENT OF STAYING IN S
<i>High Percentage Stay</i>				
1	New York-Newark-Edison, NY-NJ-PA	15,970	21,206	
2	Honolulu, HI	741	985	
3	Seattle-Tacoma-Bellevue, WA	1,416	1,903	
4	Miami-Fort Lauderdale-Pompano Beach, FL	2,095	3,010	
5	Las Vegas-Paradise, NV	496	741	
6	Los Angeles-Long Beach-Santa Ana, CA	8,847	13,960	
7	El Paso, TX	494	799	
8	Houston-Sugar Land-Baytown, TX	2,081	3,548	
9	Detroit-Warren-Livonia, MI	823	1,406	

RANK	METROPOLITAN AREA	NUMBER OF OPT EMPLOYED IN METRO	NUMBER OF OPT EMPLOYED	PERCENT OF STAYING IN S
10	Portland-Vancouver-Beaverton, OR-WA	242	414	
Low Percentage Stay				
109	Syracuse, NY	139	1,039	
110	Bloomington, IN	187	1,461	
111	Bridgeport-Stamford-Norwalk, CT	268	2,169	
112	Las Cruces, NM	32	274	
113	Lafayette, IN	236	2,136	
114	Trenton-Ewing, NJ	27	283	
115	Terre Haute, IN	24	298	
116	Beaumont-Port Arthur, TX	58	814	
117	Binghamton, NY	60	849	
118	Erie, PA	26	509	

High Foreign Student Metros

RANK	METROPOLITAN AREA	NUMBER OF OPT EMPLOYED IN METRO	NUMBER OF OPT EMPLOYED	PERCENT OF STAYING IN S
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Source: Immigration and Customs Enforcement through Freedom of Information Act (FOIA) request

University of Nevada, Las Vegas (UNLV): Foreign Student Training for Local (and Global) Labor Market Needs

UNLV is home to 94 percent of all foreign students studying in the Las Vegas metropolitan area. Business and management is the most popular major among those studying for a BMD degree, accounting for more than 63 percent of all foreign students on F-1 visas. The large majority of foreign students come from Seoul, Singapore, Hong Kong and Beijing. UNLV’s world-renowned William H. Harrah College of Hotel Administration is home to many foreign students studying management—specifically for hotels and hospitality.

Given the large gaming and hospitality industry clustered in Las Vegas, the metro area is a top destination for foreign graduates to work under the OPT program after they graduate. There is a large demand by Las Vegas employers for graduates that are multi-lingual, especially those who can speak Mandarin Chinese, Cantonese, or Korean to cater to the growing Asian clientele coming to Las Vegas casinos and hotels. Several Las Vegas-headquartered hotels also have a growing presence in Singapore, Macau and parts of China. Many foreign students studying at UNLV help fill these demands through their degree programs and the OPT program.

For instance, the bachelor’s degree program at the Harrah school requires students to complete 1,000 hours of work experience through an internship or part-time employment in the hotel industry. Many foreign students fulfill this requirement by using the Curriculum Practical Training (CPT) program, which allows foreign students to work 20 hours a week while as a student. After they graduate from UNLV, many continue to work for a Las Vegas hotel full-time under the OPT program for 12 months and in some instances, under a management training program leading to management positions in Las Vegas or in hotel expansions abroad in Asia.

Source: Interviews with University of Nevada, Las Vegas William H. Harrah College of Hotel Administration and MGM Grand International

Smaller college towns, by contrast, have the lowest percentages of their OPTs working in the same metro area as the institutions they attended. Erie, Pa. has the smallest percentage of its OPTs remaining to work in the same metro area they graduated from, at only 5 percent of its 510 OPTs. The other lowest-retaining OPT metros include Binghamton, N.Y. (7 percent, home of Binghamton University), Beaumont, Texas (7 percent, home of Lamar University), Terre Haute, Ind. (8 percent, home of Indiana State University) and Trenton, N.J. (10 percent, home of Princeton University).⁹³

Beyond retention statistics, some metro areas rate more highly than others in their foreign students' usage of the OPT program, regardless of their post-graduate employment location. The best measure of this is the ratio of the number of OPTs granted from a metropolitan area's colleges and universities, to the number of foreign students on F-1 visas in the same metro area, for the years 2008 to 2012.⁹⁴In the high foreign student metros, there were 324,151 OPTs and 957,028 F-1s during the 2008-2012 period, suggesting an average OPT-to-F-1 ratio of 0.339.

Beaumont, Tex. has the highest ratio (0.565) of OPTs from its school working somewhere in the United States to the number of foreign students studying in the same metro area (Table 12). This ratio shows that many foreign students educated in Beaumont take advantage of the OPT program, even though relatively few (as highlighted above) use their OPT to work in Beaumont. Other metro areas in which large shares of graduates use the OPT include Bridgeport, Conn. (0.509), Gainesville, Fla.(0.495), College Station, Texas (0.480) and Mobile, Ala. (0.459).

Table 11. Top and Bottom 10 Metropolitan Areas Ratio of the Number of OPT Working in the United States to Foreign Students on F-1 Visas, 2008-2012

RANK	METROPOLITAN AREA	NUMBER OF OPT WORKING ANYWHERE IN US FROM METRO	NUMBER OF FOREIGN STUDENTS ON F-1 VISAS	RATIO
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High Percentage Stay

1	Beaumont-Port Arthur, TX	950	1,680	
2	Bridgeport-Stamford-Norwalk, CT	2,672	5,254	
3	Gainesville, FL	3,391	6,846	

RANK	METROPOLITAN AREA	NUMBER OF OPT WORKING ANYWHERE IN US FROM METRO	NUMBER OF FOREIGN STUDENTS ON F-1 VISAS	RATIO
4	College Station-Bryan, TX	3,236	6,736	
5	Mobile, AL	814	1,774	
6	San Jose-Sunnyvale-Santa Clara, CA	8,627	19,015	
7	Charlottesville, VA	1,253	2,789	
8	Baton Rouge, LA	1,127	2,514	
9	Blacksburg-Christiansburg-Radford, VA	1,515	3,425	
10	Athens-Clarke County, GA	855	1,970	
<i>Low Percentage Stay</i>				
109	Tuscaloosa, AL	407	1,915	
110	Springfield, MO	537	2,542	
111	Tulsa, OK	440	2,164	
112	Fort Collins-Loveland, CO	341	1,856	

RANK	METROPOLITAN AREA	NUMBER OF OPT WORKING ANYWHERE IN US FROM METRO	NUMBER OF FOREIGN STUDENTS ON F-1 VISAS	RATIO
113	Corvallis, OR	480	2,731	
114	Eugene-Springfield, OR	646	4,637	
115	Jonesboro, AR	229	2,705	
116	Indianapolis-Carmel, IN	289	3,634	
117	Spokane, WA	193	2,646	
118	Manchester-Nashua, NH	48	2,100	
	High Foreign Student Metros	324,151	957,028	

Source: Immigration and Customs Enforcement through Freedom of Information Act (FOIA) request

Other metro areas exhibit relatively infrequent usage of the OPT program among their foreign student graduates. For instance, Manchester, N.H. had only 48 OPTs from 2008 to 2012, despite having 2,100 foreign student approvals for F-1 visas during that time, the lowest ratio among the 118 metro areas (0.023). Other metro areas with a low number of OPTs to F-1 visas include Spokane, Wash. (0.073), Indianapolis, Ind.

(0.080), Jonesboro, Ark. (0.085) and Eugene, Ore. (0.139).

POLICY DISCUSSION

Foreign students in the United States are assets to both their U.S. metropolitan destinations and their hometowns of origin. The F-1 visa program allows foreigners, largely from newly emerging economies, to gain access to an American higher education. This exposure presents the opportunity to gain skills and knowledge often unavailable in their home communities. It also allows these highly educated migrants to form cross-border networks and serve as valuable bridges between the United States and global metropolitan areas. Moreover, U.S. metropolitan economies also benefit from foreign student spending on educational expenses and associated living costs while in school. And foreign students are a potential source for meeting skills demands and fostering entrepreneurial activities in local labor markets.

Increasingly, U.S. higher education institutions are educating future business, scientific and political leaders from the world's fastest-growing emerging economies. Metro leaders should be strategic in

leveraging foreign students while they are here so that their local economies can compete in the global marketplace. For example, foreign students with significant work experience abroad studying at U.S. business schools in Los Angeles and Syracuse are serving as valuable bridges for businesses in U.S. metro areas seeking to tap their hometown markets abroad (see boxes below).

Retaining foreign students after they graduate has been challenging under current U.S. immigration law. The current U.S. visa system does not provide a direct pathway for foreign students from earning a degree to permanent residency. While the Optional Practical Training (OPT) program does allow F-1 visa holders to work post-graduation, it is temporary. The OPT program allows foreign students with non-STEM degrees to work for 12 months, while STEM graduates can have up to 29 months of post-graduation work.⁹⁵

If F-1 visa holders want to work beyond the OPT period, their employers must compete for H-1B visas. The current visa system limits the number of H-1B visas to 85,000 for private employers per year, of which 20,000 are set aside for graduates of U.S. universities. While H-1B visas are an option for students, only 35 percent of H-1B visas in 2010 went to former F-1 visa holders,

including those extended through OPT.⁹⁶ Furthermore, if a former foreign student's employer is able to obtain an H-1B visa and then sponsors a green card application, the wait time for permanent residency can be more than 10 years due to per-country limits, a problem particularly for Indian and Chinese nationals—two of the largest foreign student populations.⁹⁷

Many federal policymakers have been trying to streamline the immigration system for foreign students. Several pieces of bipartisan legislation have been introduced in Congress in recent years aimed at retaining more foreign students in the U.S. labor market post-graduation. These include proposals with catchy acronyms such as the STAPLE, STEM, STAR, BRAINS and SMART Acts, all of which would create a green card for foreign students receiving graduate degrees in the STEM fields so they can work in the United States immediately after graduating.⁹⁸

Concerns persist around these proposals, however. Some critics argue that streamlining foreign students' pathways to green cards would limit job opportunities for U.S.-born workers and lower wages.⁹⁹ Others warn that green cards for foreign students could lead to a proliferation of low-quality schools that become "green card mills," rather than providing high-quality education

(as illustrated by the cautionary tale of foreign students coming from Hyderabad, India).¹⁰⁰

Short of more fundamental reforms such as these, there remain meaningful positive steps that metropolitan leaders can take to maximize the economic and educational benefits of foreign students' local presence. Along those lines, metro leaders can take steps to:

- Leverage foreign student connections with their home communities abroad to facilitate and deepen economic exchange
- Retain foreign student skills by connecting graduates to employers located in the school's metropolitan area

A. Leverage foreign student connections with their home communities abroad to facilitate and deepen economic exchange.

Metropolitan leaders should leverage foreign students' connections between their communities abroad and their school's metro economies. Many foreign students possess valuable knowledge of the business, cultural

and societal norms of two places simultaneously and can serve as powerful bridges.

As highlighted in this analysis, America's foreign students come from fast-growing emerging cities in Asia, the Middle East and Latin America. Given that metropolitan areas are the export engines and foreign direct investment (FDI) destinations of states and of the nation as a whole, foreign students from these markets are valuable assets for globalizing local economies.¹⁰¹

There are a few examples of how metropolitan economies are benefiting from foreign students' connections. Some schools have developed programs using foreign students' knowledge by creating courses or employment opportunities with local businesses that want to build international strategies. This has been a successful three-decade program at the USC Marshall School of Business in the Los Angeles metro area with international MBA students offering consultancy services to local businesses that want to export their products in global markets. In the same metro area, the UCLA Anderson School of Management has executive MBA students offering the same type of services for foreign companies wanting to expand into U.S. markets. Foreign students have played an integral part in these programs since at least one team member of

each consultancy project is a foreign student from the country to which their client is seeking to expand.¹⁰² These foreign students already have valuable market information, large business networks, language skills and a deep understanding of the regulatory environment of their target markets. A similar program exists at Syracuse University where the Center for International Business helps local companies develop international business plans by either employing foreign students through the Curricular Practical Training (CPT) program or through project assignments through an international entrepreneurship course.¹⁰³

USC and UCLA Leverage Foreign Students for Metro-to-Global City Exchanges

While the STEM fields collectively have the largest number of foreign BMD students, business administration is the single most popular field of study. At the University of Southern California (USC), the school with the highest number of foreign students in the country, the Marshall School of Business has an international master's in business administration (MBA) program that leverages the networks, knowledge and language skills of foreign students to assist local companies with their international strategies. Since the 1986/1987 school year, MBA students in the accelerated 12-month program for mid-career professionals with 10 to 11 years of work experience, are required to enroll in an international business consulting project to help Los Angeles-based companies and others to export to global markets. In 2012 and 2013, large companies paid \$22,000 for these consulting services. These fees cover the MBA Research Teams' expenses to travel internationally for two weeks to interview potential customers and suppliers and to gather information on competitors. In exchange, companies receive high-quality, proprietary reports equivalent to those that top-tier consulting firms would bill at 10 times that. In 2012 and 2013, the federal government, through the Small

Business Administration (SBA), provided \$10,000 State and Trade and Export Promotion (STEP) grants to a few small- and medium- sized enterprises which wanted to participate in this program at a subsidized price of \$12,000. [Click here for more information.](#)

The UCLA Anderson School of Management has a counterpart course for their executive MBA students that also used STEP funds to subsidize a few American SMEs develop exports in 2012 and 2013. More information is [available here.](#)

Programs leveraging foreign student knowledge and skills can be developed to help metropolitan economies increase exports, attract FDI, or develop global manufacturing supply chains. Metropolitan leaders should work with local businesses and higher educational institutions to gain access to foreign students.

To leverage foreign students' global connections to benefit metro-to-global city exchanges:

- States and metropolitan leaders should work with local higher educational institutions to develop courses that challenge foreign students to build international business plans for local businesses.
- The federal government should provide financial incentives for states, local governments and educational institutions to work with local businesses to utilize foreign students' skills and connections to their home communities abroad.

- Colleges and universities should partner with local employers to develop internship and post-graduation opportunities for foreign students through the Curricular Practical Training (CPT) and Optional Practical Training (OPT) programs.

B. Retain foreign student skills by connecting graduates to employers located in the school's metropolitan area

Access to specialized labor already educated and living in the local economies can help fill the skills demands of companies in U.S. metro areas. As this report illustrated, many students at the local universities are training for STEM and business degrees—sometimes they are the large majority of programs that are highly sought out by employers. Metropolitan leaders can help educate local employers on how to obtain the necessary visas so that they can hire foreign graduates from their local higher educational institutions. For example, Syracuse University has a program to help connect current foreign students with local employers and to educate employers of the process for hiring foreign students to increase their chances of staying to work in the metro area post-graduation (see Syracuse box below).

Syracuse University Utilizing Foreign Students Locally to Develop Globally

Since 1998, the Center for International Business at Syracuse University program called Export New York has helped local companies develop their international business plans. With some support from the New York State Department of Economic Development and some funds from county and local businesses, students help companies identify market trends abroad. Many foreign students, especially from China, India, South Korea and Thailand, participate in this program since they have the knowledge, networks and language skills to understand and develop plans in their home countries. Students can participate in this program in two ways: (1) through the International Entrepreneurship course where students are assigned to participating companies or (2) by being paid employees through the Curricular Practical Training (CPT) program at the Center for International Business to work specifically on these international business plans. The Center for Advanced Systems and Engineering (CASE) at Syracuse also has a program to connect foreign students with local employers so that they can gain work experience and increase their chances of staying in the metro area after they graduate. CASE helps employers understand how to overcome the hurdles of hiring foreign students, through the CPT program and the post-graduation Optional Practical Training (OPT).

Source: Interview with Syracuse University, Center for Advanced Systems and Engineering

But metropolitan leaders are limited in the type of visas made available by the federal government for foreign students to stay and work post-graduation. If federal legislation is passed to create an easier pathway for retaining foreign students that obtain degrees at U.S. universities, the impact could be large, especially at the metropolitan level. There are 82 metropolitan areas that have both a high concentration of F-1 foreign students and a high demand for H-1B visas.¹⁰⁴ On average

between 2010 and 2011, these 82 metro areas have 167,634 incoming foreign students on F-1 visas, while employers requested 283,449 H-1B visas. These metro areas could potentially benefit if employers are unable to fill these jobs with the existing local workforce or through the H-1B visa program. Having access to visas to retain foreign students already living in the region could potentially help fill these employers' skills needs.

Policymakers have proposed to change the F-1 visa program to a dual intent visa so foreign students can have a direct pathway to a green card—avoiding the H-1B visa competition. But leaders should be cautious to limit employer sponsorship to foreign students from high quality educational institutions. To avoid green card mills and to control the number of foreign students that might have an impact on native-born workers, there has been discussion of limiting the green cards to only foreigners obtaining BMD degrees from doctorate-granting Carnegie institutions performing very high- or high-research activities. Additionally, the U.S. education secretary can make recommendations on other schools that are accredited and high-quality institutions, such as schools that are highly ranked liberal arts colleges (e.g. Amherst or Williams College), but are not considered Carnegie doctorate-granting research institutions.

There are several ways of limiting the number of foreign students on F-1 visas that could qualify for permanent residency based on quality of the academic institutions and high-priority degree programs such as STEM:

- Over the 2008 to 2012 period, if every F-1 student studying for a bachelor's degree or above (BMD) qualified for a green card, on average there would be 164,202 foreign students qualified per year.
- If BMD F-1 students from high and very-high research doctorate-granting schools were able to receive a green card, on average there would be 126,014 who would qualify per year over the same period.
- If legislation restricted green cards to BMD F-1 students from only very-high research doctorate-granting schools, 87,902 would qualify on average over the past five-year period.
- If policymakers wanted to limit green cards to only BMD F-1 students studying for STEM degrees, 67,768 would qualify per year on average over the same time period.
- If legislators only wanted F-1 STEM master's and doctorate students to qualify for green cards, 56,170

would qualify per year on average during the five year period.

- If leaders wanted to limit the number of F-1 visa holders that can obtain green cards to only foreign STEM doctorate students, then 17,533 would qualify per year on average from 2008-2012.

As recommended in a previous [Brookings H-1B report](#), future adjustments to these levels could be made by an independent “Standing Commission on Labor and Immigration” who could make real-time recommendations to Congress based on a data-driven analysis of national and local labor market needs.¹⁰⁵

To better retain foreign students studying in their metro areas:

- Metro leaders should develop programs to educate local employers about the visa process for retaining foreign students.
- State and metropolitan leaders can develop programs to connect foreign students at their colleges and universities to local and state employers.

- Metro leaders should advocate for federal immigration reform so that more visas are available for retaining foreign students.

CONCLUSION

The data and trends reviewed in this report offer new sub-national information about the destinations and origins of foreign students and how the United States and its regions can retain and leverage them to facilitate metro-to-global city exchanges.

These metro areas and the schools located within them already benefit from the large financial contributions from foreign student tuition and living expenses. Some local businesses are partnering with universities to use the knowledge and networks of foreign students to expand into global markets. Metropolitan economies can potentially benefit if the federal government reforms the immigration system to increase retention of America's foreign students. Employers located within each metro area could potentially gain access to a larger pool of potential workers already residing in their local economies, especially from foreign students studying in the STEM fields.

Metropolitan leaders wanting to retain U.S.-trained foreigners should help educate local employers on how to obtain the necessary visas through the current U.S. immigration system. As already proposed by Congress, the federal government can also make changes in the F-1 visa program to allow foreign students from high-quality schools to apply directly for permanent residency if an employer is hiring them. State and metropolitan leaders should engage with their local higher educational institutions to utilize foreign students' knowledge and connections with markets abroad to benefit local businesses. These reforms can help metropolitan economies grow in more productive, inclusive and sustainable ways.

Notes

1. Neil G. Ruiz, "Immigration Facts on Foreign Students," Washington: Brookings Institution, 2013. Available at www.brookings.edu/metro/foreignstudents; Institute of International Education, *Open Doors: Report on International Educational Exchange*, New York: Institute of International Education, 2013.

2. Sonia Plaza, "Diaspora resources and policies," in Amelie F. Constant and Klaus F. Zimmermann, *International Handbook on the Economics of Migration* (Northampton: Edward Elger Publishing Limited, 2013), pp. 505-529.

3. AnnaLee Saxenian, *The New Argonauts: Regional Advantage in a Global Economy*, Cambridge: Harvard University Press, 2007. See also: AnnaLee Saxenian, "Silicon Valley's New Immigrant Entrepreneurs," San Francisco: Public Policy Institute of California, 1999; AnnaLee Saxenian, "From Brain Drain to Brain Circulation: Transnational Communities and Regional Upgrading in India and China," *Studies in Comparative International*

Development, Summer 2005; AnnaLee Saxenian, "The Bangalore Boom: From Brain Drain to Brain Circulation," in Kenneth Kenniston and Deepak Kumar (eds), *Bridging the Digital Divide: Lessons from India*, Bangalore: National Institute of Advanced Study, 2000.

4. Ibid.

5. Sonia Plaza, "Diaspora resources and policies," in Amelie F. Constant and Klaus F. Zimmermann, *International Handbook on the Economics of Migration* (Northampton: Edward Elger Publishing Limited, 2013), pp. 505-529.

6. Beata S. Javorcik, Caglar Ozden, Mariana Spatareanu and Christina Neagu, "Migrant networks and foreign direct investment," Policy Research Working Paper Series 4046, Washington DC: The World Bank, 2006.

7. Robert Guest, *Borderless Economics: Chinese Sea Turtles, Indian Fridges and the New Fruits of Global Capitalism*, New York: Palgrave Macmillan, 2011.

8. For academic research on the brain drain see Jagdish Bhagwati and Dellafar, "The Brain Drain and Income Taxation," *World Development*, vol. 1 (1973). See also Jagdish Bhagwati (ed), *Taxing the Brain Drain, Vol. 1: A Proposal*, Amsterdam: North-Holland, 1976; Jagdish Bhagwati (ed), *The Brain Drain and Taxation, Vol. 2: Theory and Empirical Analysis*, Amsterdam: North-Holland, 1976; and Jagdish Bhagwati and Koichi Hamada, "The Brain Drain International Integration of Markets for Professionals and Unemployment: A Theoretical Analysis," *Journal of Development Economics*, vol. 1 (1974: 19-24). Also see recent reporting by Pankaj Mishra, "When the Best and Brightest Leave India and China," *Bloomberg*, October 20, 2013. For further explanation of how brain drain has different affects on developing nations depending on the size of the origin country, see David Gibson and David McKenzie, "Eight Questions about Brain Drain," *Journal of Economic Perspectives*, 25(3): 107-128.

9. For new research showing a positive impact expatriates make on their home countries see Yevgeny Kuznetsov and Charles Sabel, "International Migration of Talent, Diaspora Networks and Development: Overview of Main Issues," in Yegvgeny Kuznetsov (eds), *Diaspora Networks and the International Migration of Skills: How Countries Can Draw on Their Talent Abroad*, Washington: World Bank, 2006.

10. Robert E.B. Lucas, "International Labor Migration in a Globalizing Economy," Washington: Carnegie Endowment for International Peace, 2008.
11. Partnership for a New American Economy, "Immigrants Behind 76% of Patents from Top American Universities," New York, June 26, 2012, available at www.renewoureconomy.org/wp-content/uploads/2013/07/patent-pending.pdf; and Diana Furchtogott-Roth, "The Economic Benefits of Immigration," *Issue Brief*, no. 18, New York: Manhattan Institute for Policy Research, February 2013, available at www.manhattan-institute.org/html/ib_18.htm#.U8QrJFaNJ8Y.
12. Vivek Wadhwa, *The Immigrant Exodus: Why America is Losing the Global Race to Capture Entrepreneurial Talent*, Philadelphia: Wharton Digital Press, 2012. See also The Partnership for a New American Economy and The Partnership for New York City, "Not Coming to America: Why the U.S. is Falling Behind in the Global Race for Talent," New York, May 2012, available at www.renewoureconomy.org/sites/all/themes/pnae/not-coming-to-america.pdf.
13. NAFSA, "NAFSA Priorities for Commonsense Immigration Reform," available at www.nafsa.org/Explore_International_Education/Advocacy_And_Public_Policy/International_Student_And_Scholar_Access_To_US_Higher_Education/Immigration_Reform_Issues/NAFSA_Priorities_for_Commonsense_Immigration_Reform/ (accessed June 4, 2014).
14. George J. Borjas, "Do Foreign Students Crowd Out Native Students from Graduate Programs?" Boston: National Bureau of Economic Research, 2004.
15. George P. Borjas, "The Labor Market Impact of High-Skill Immigration," *American Economic Review*, vol. 19, no. 2 (2005).
16. Norm Matloff, "Are Foreign Students the 'Best and Brightest'? Data and Implications for Immigration Policy," EPI Briefing Paper #356, Washington: Economic Policy Institute, 2013.
17. The only study examining foreign students at the metropolitan level is the annual *Open Doors* publication by the Institute of International Education. The annual report is based on survey data of universities to produce an estimated "stock" number of international students, rather than based on actual visa approval data. The report provides the top 50 metropolitan areas with estimated stock data on foreign students, the percent

change from the previous school year and the number of educational institutions in the metropolitan area. For stay rates of foreign students after they graduate, national level analysis has been done specifically for foreign doctorate recipients by Michael G. Finn, "Stay Rates on Foreign Doctorate Recipients, 2009," Oak Ridge: Oak Ridge Institute for Science and Education, 2012, available at www.orise.orau.gov/files/sep/stay-rates-foreign-doctorate- recipients-2009.pdf.

18. Mark R. Rosenzweig, Douglas A. Irwin and Jeffrey G. Williamson, "Global Wage Differences and International Student Flows," *Brookings Trade Forum*, Washington, DC: Brookings Institution Press, 2006: 57-96.

19. Vinod B. Agarwal and Donald R. Winkler, "Migration of Foreign Students to the United States," *The Journal of Higher Education*, vol. 56, no. 5 (September-October 1985): pp. 509-522.

20. Institute of International Education, *Student Mobility and the Internationalization of Higher Education: National Policies and Strategies from Six World Regions, A ProjectAtlas Report*, New York: Institute of International Education, 2011.

21. Neil G. Ruiz and Madeline Baron, "Even Without Immigration Reform Foreign Students at Record High," Washington: Brookings Institution, 2013. Available at www.brookings.edu/blogs/the-avenue/posts/2013/11/15-immigration-reform- foreign-students-ruiz-baron.

22. UNESCO Institute for Statistics, "Table 18A: International flows of mobile students at the tertiary level (ISCED 5 and 6)," and for total tertiary enrollment see UNESCO, "Table 15: Enrolments by broad field of education in tertiary education."

23. Neil G. Ruiz, "Immigration Facts on Foreign Students," Washington: Brookings Institution, 2013. Available at www.brookings.edu/research/interactives/2013/facts-on-foreign- students

24. UNESCO Institute for Statistics, "Table 18A: International flows of mobile students at the tertiary level (ISCED 5 and 6)," and for total tertiary enrollment see UNESCO, "Table 15: Enrolments by broad field of education in tertiary education." See also Neil G. Ruiz, "Immigration Facts on Foreign Students," Washington:

Brookings Institution, 2013. Available at www.brookings.edu/research/interactives/2013/facts-on-foreign-students.

25. *Immigration and Nationality Act*, H.R. 5678, 82 Cong. 2 sess. (Government Printing Office, 1952).

26. Office of Immigration Statistics, "Nonimmigrant Admissions to the United States: 2012, Annual Report,"

Washington, DC: Department of Homeland Security, 2013, available at www.dhs.gov/sites/default/files/publications/ois_ni_fr_2012.pdf.

This percentage was calculated by using the total number of non-immigrant admissions data from I-94 forms for academic students on F-1 visa (1,566,815), vocational students on M-1 visa (17,600) and exchange visitors on J-1 visa (421,425). This calculation excludes the spouses and children of F-1 visa holders (69,161) and exchange visitors (53,807). Note that these are "admissions" data which is the number of entries into the United States rather than the number of visas issued (done by the Department of State) or the visa approvals (done by Department of Homeland Security).

27. The pros of making the F-1 visa a "dual intent" visa is that it would allow foreign students studying in the United States to obtain a green card through employer sponsorship while on the F-1 visa, rather than having to obtain one of the limited number of H-1B visas (85,000 per year) available per year. On the other hand, making the program "dual intent" might increase permanent immigration substantially by foreign students sparking a higher demand for foreign students to come study in the United States. This could potentially also decrease wages of native-born workers studying in the same fields and seeking jobs post-graduation since the potential supply of labor would be larger.

28. *Immigration and Nationality Act*, H.R. 5678, 82 Cong. 2 sess. (Government Printing Office, 1952).

29. Teresa Brawner Bevis and Christopher J. Lucas, *International Students in American Colleges and Universities: A History*, New York: Palgrave MacMillan, 2007.

30. Ibid.

31. Chad C. Haddal, "Foreign Students in the United States: Policies and Legislation," Washington, DC: Congressional Research Service, 2006.

32. Teresa Brawner Bevis and Christopher J. Lucas, *International Students in American Colleges and Universities: A History*, New York: Palgrave Macmillan, 2007.
33. Alison Siskin, "Monitoring Foreign Students in the United States: The Student and Exchange Visitor Information System (SEVIS)," Washington, DC: Congressional Research Service, 2005.
34. Student and Exchange Visitor Program, "Student and Exchange Visitor Information System: General Summary Quarterly Review," Washington, DC: Immigration and Customs Enforcement, July 3, 2013, available at www.ice.gov/doclib/sevis/pdf/by-the-numbers.pdf (accessed December 4, 2013).
35. Since full implementation in 2003, SEVIS has been viewed as an adequate system for alerting authorities of suspicious activities or unlawful behavior. There have been several incidences when student visa holders entered the country and school officials reported to the Department of Homeland Security (DHS) of their absence that led to surveillance of these students. SEVIS was recently scrutinized during the Boston Marathon bombing that took place on April 15, 2013 since a close friend of one of the bombers entered the U.S. on invalidated F-1 student visas. After this incidence, the Customs and Border Protection (CBP) that is in charge of screening arrivals at airports and borders was ordered to verify each foreign student's visa status in the SEVIS computer database before approving entry into the United States.
36. Alison Siskin, "Monitoring Foreign Students in the United States: The Student and Exchange Visitor Information System (SEVIS)," Washington, DC: Congressional Research Service, 2005.
37. Student and Exchange Visitor Program, "Student and Exchange Visitor Information System: General Summary Quarterly Review," Washington, DC: Immigration and Customs Enforcement, July 3, 2013, available at www.ice.gov/doclib/sevis/pdf/by-the-numbers.pdf (accessed December 4, 2013).
38. During this process, the prospective student receives a visa after paying a \$200 fee imposed by the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996 that is paid to Immigration and Customs Enforcement (ICE).
39. Chad C. Haddal, "Foreign Students in the United States: Policies and Legislation," Washington, DC: Congressional Research Service, 2006.

40. NAFSA, "NAFSA Adviser's Manual," available at [www.nafsa.org/ /file/ /am_resource/8cfr2142f.htm#2142f9ii](http://www.nafsa.org/file/am_resource/8cfr2142f.htm#2142f9ii) (accessed March 22, 2014).
41. Immigration Customs and Enforcement, "Practical Training," available at www.ice.gov/sevis/practical-training (accessed December 4, 2013).
42. Immigration Customs and Enforcement, "Practical Training," available at www.ice.gov/sevis/practical-training (accessed December 4, 2013).
43. University of Michigan International Center, "Curricular Practical Training (CPT) for F-1 Students," available at www.internationalcenter.umich.edu/immig/fvisa/f_cpt.html#types (accessed December 4, 2013).
44. Berkeley International Office, University of California, "Curricular Practical Training," available at www.internationaloffice.berkeley.edu/students/current/f-1/curricular_practical_training (accessed December 4, 2013).
45. Immigration Customs and Enforcement, "Practical Training," available at www.ice.gov/sevis/practical-training (accessed December 4, 2013).
46. A list of approved STEM degrees authorized for the 29 month Optional Practical Training (OPT) is available at: Immigration and Customs Enforcement, "STEM-Designated Degree Program List," available at www.ice.gov/doclib/sevis/pdf/stem-list.pdf (accessed December 5, 2013).
47. Immigration Customs and Enforcement, "Practical Training," available at www.ice.gov/sevis/practical-training (accessed December 4, 2013).
48. Immigration and Customs Enforcement, "Practical Training," available at www.ice.gov/sevis/practical-training (accessed March 22, 2014).
49. Neil G. Ruiz and Shyamali Choudhury, "Beyond H-1B: Other Avenues to Adding Skilled Workers," *The Avenue*, June 25, 2012.
50. Interview with Immigration and Customs Enforcement, Student and Exchange Visitor Program, December 2, 2013.
51. United States Government Accountability Office, "H-1V Visa Program: Reforms Are Needed to minimize the Risks and Costs of the Current Program" (2011).

52. Neil G. Ruiz, Jill H. Wilson and Shyamali Choudhury, "The Search for Skills: Demand for H-1B Immigrant Workers in U.S. Metropolitan Areas," Washington, D.C.: Brookings Institution, 2012, available at: www.brookings.edu/metro/h1b.

53. Ibid.

54. ICE used the Student and Exchange Visitor Program (SEVP) office records that contained all of the I-20 forms data.

55. Interview with staff at the Immigration and Customs Enforcement, Student and Exchange Visitor Program, December 2, 2013.

56. Interview with staff at the Immigration and Customs Enforcement, Student and Exchange Visitor Program, December 2, 2013.

57. Even though the F-1 visa approval data is a flow variable, the report does use stock measures, such as the total number of bachelor's degrees and higher students in a metropolitan area to baseline the flow data.

58. Institute of International Education, *Open Doors: Report on International Educational Exchange*, New York: Institute of International Education, 2013.

59. The 1,500 threshold was selected by using a Jenks optimization to find a natural break in the distribution.

60. The 30 metro areas that are in the top 100 most populous but are not a high foreign student metro area include the following: Jacksonville, FL, Memphis, TN, Raleigh, NC, Salt Lake City, UT, Birmingham, AL, Fresno, CA, Albuquerque, NM, Bakersfield, CA, Oxnard, CA, McAllen, TX, Grand Rapids, MI, Greensboro, NC, North Port, FL, Stockton, CA, Charleston, SC, Poughkeepsie, NY, Colorado Springs, CO, Greenville, SC, Cape Coral, FL, Boise City, ID, Lakeland, FL, Des Moines, IA, Augusta, GA, Scranton, PA, Ogden, UT, Youngstown, OH, Harrisburg, PA, Jackson, MS, Chattanooga, TN and Lancaster, PA.

61. For more information about the Carnegie Classification System see: classifications.carnegiefoundation.org (accessed February 1, 2014).

62. For more information

see: www.mckinsey.com/insights/economic_studies/global_cities_of_the_future_an_interactive_map.

63. For more information see: www.data.worldbank.org/about/country-classifications.
64. Classification of Instruction Programs (CIP) is a standard classification system for postsecondary institutions to describe and aggregate college majors. For more information about CIP codes see the National Center for Education Statistics: www.nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.
65. Immigration and Customs Enforcement, "STEM Designated Degree Programs," available at www.ice.gov/sevis/stemlist.htm (accessed September 11, 2013).
66. Travel.State.Gov, "Student Visas," available at www.travel.state.gov/visa/tem/p/types/types_1268.html (accessed September 20, 2013).
67. For information about the decline and outcry after September 11th see B. Lindsay Lowell, Micah Bump and Susan Martin, "Foreign Students Coming to America: The Impact of Policy, Procedures and Economic Competition," Washington, DC: Georgetown University Institute for the Study of International Migration, 2007.
68. For longer historical period of the growth of international students in the United States from 1950 onwards, see slide two at: www.brookings.edu/research/interactives/2013/facts-on-foreign-students. This data is from the Institute for International Education (IIE) for all international students studying in the United States. Unfortunately the F-1 specific data is not available prior to 2001 since Immigration and Customs Enforcement (ICE) did not collect this data until 2001.
69. This figure includes all F-1 foreign students, including language training, K-12, associates, bachelor's and higher degree programs.
70. The data in this report do not detail the exact amount of personal funds brought from abroad. Since international students access to the U.S. federal financial aid system is limited, the amount of money brought into the United States to pay for school costs varies by degree program. Unless the student receives financial aid from their home government, a private foundation, or the school, they would be paying for educational expenses from their family or personal income. Foreign students studying for doctoral degrees are more likely to have full or partial funding from fellowships, research assistantships, or teaching grants to cover their educational expenses. Additionally, depending on the field of study and resources available at universities, some master's students could see the same types of funding as doctoral students. The financial contributions

of foreign students have been estimated by NAFSA: Association of International Educators, "International Student Economic Value Tool," available at www.nafsa.org/economicvalue. Also cited and published in Institute of International Education, *Open Doors: Report on International Educational Exchange*, New York, 2013.

71. The World Bank, *World Development Indicators*, Washington, 2013.

72. Randall S. Jones and Satoshi Urasawa, "Sustaining Korea's Convergence to the Highest-Income Countries," *OECD Economics Department Working Papers*, No. 965, Paris: OECD Publishing, 2012. The International Monetary Fund changed the category of South Korea from a developing to advanced economy in 1997.

73. Institute on International Education, *Open Doors: Report on International Educational Exchange*, New York, 2013.

74. The rest of the schools (4,127) were for foreign students studying for associates degrees, language training and skills courses such as test preparation courses.

75. Carnegie Foundation for the Advancement of Teaching, "Classification Description," available at www.classifications.carnegiefoundation.org/descriptions/basic.php (accessed October 2, 2013).

76. For numbers of U.S. overall numbers on business and STEM degree programs the author used data from the National Center for Education Statistics, "Table 318.20. Bachelor's, master's, doctor's degrees conferred by postsecondary institutions, by field of study: Selected years, 1970-71 through 2011-12," available at www.nces.ed.gov/programs/digest/d13/tables/dt13_318.20.asp. The author calculated percentages based on 2008 to 2012 numbers of the "Business" and "STEM fields" (included "social/behavioral sciences, natural sciences and mathematics, computer sciences) each divided by the total number of bachelor's, master's and doctor's degrees conferred during the same five year period.

77. Brookings analysis of U.S. Census Bureau American Community Survey data from 2008 to 2012 period of students in bachelors or higher degree programs in U.S. metropolitan statistical areas.

78. Denis M. McSweeney and Walter J. Marshall, "The Prominence of Boston Area Colleges and Universities," Washington, DC: Bureau of Labor Statistics, 2009, available at www.bls.gov/opub/mlr/2009/06/regrep.pdf.

79. See Jason Baumgartner analysis available at www.nafsa.org/eis and Institute of International Education, *Open Doors: Report on International Educational Exchange*, New York, 2013. Foreign graduate students, especially doctorate students, are more likely to be receiving research assistantships or fellowships to cover their tuition and living expenses, while foreign bachelor's degrees students are less likely.

80. This figure is based on the total "sticker price" tuition for foreign students on F-1 visas to attend these schools. It does not take into account any scholarships, financial aid, research assistantships since the data is not available to make an accurate breakdown.

81. For more information about the Programa de Asistencia Estudiantil see www.academics.utep.edu/Default.aspx?tabid=69645.

82. These 94 cities represent 50.7 percent of all foreign students coming into the U.S. to study. This percentage was calculated by dividing the total number of foreign students on F-1 visas coming from these 94 cities that sent at least 1,500 students during 2008-2012 period over the total number of all foreign students studying in the U.S.

83. Brookings analysis of Immigration and Customs Enforcement data and McKinsey Global Cities of the Future data for city population sizes.

84. Brookings analysis of Brookings analysis of Immigration and Customs Enforcement data and McKinsey Global Cities of the Future data for city GDP per capita.

85. Brookings analysis of Brookings analysis of Immigration and Customs Enforcement data and McKinsey Global Cities of the Future data for city GDP per capita.

86. For example, Chengdu (ranked 17th among source cities of F-1 students) is projected to increase its GDP 5.3 times from a total GDP of \$58 billion in 2010 to \$310 billion in 2025. Other projected fast-growing hometowns among the top senders include Wuhan (projected GDP growth 5.0 times of 2010 GDP), Beijing (5.0 times), Nanjing (5.0 times) and Hyderabad (4.6 times). Brookings analysis of McKinsey Global Cities of the Future data.

87. Rodney C. Adkins, "America Desperately Needs More STEM Students. Here's How to Get Them," *Forbes Magazine*, July 9, 2012.

88. Jonathan Rothwell, "Still Searching: Job Vacancies and STEM Skills," Washington, D.C.: Brookings Institution, 2014, available at <http://www.brookings.edu/research/interactives/2014/job-vacancies-and-stem-skills#/M10420>.

89. Currently, there are only 207 doctoral-granting institutions under the Carnegie Foundation's classification system that has high or very high research activity.

90. For more information about the classification system see Carnegie Foundation for the Advancement of Teaching, "Classification Description," available at www.classifications.carnegiefoundation.org/descriptions/basic.php (accessed October 2, 2013).

91. Graduates from U.S. higher educational institutions with STEM-designated degrees can work under OPT for 29 months. All other U.S. degree holders can only work for up to 12 months. Obtaining OPT requires the student to apply through their degree granting university for approval by the U.S. government. There is no cap on the number of OPTs that can be approved per year.

92. This uses newly acquired SEVIS data granted to the author from Immigration and Customs Enforcement under a Freedom of Information Act (FOIA) request.

93. Note that Princeton University is located in Mercer County which is the only county that is part of the Trenton-Ewing, NJ metropolitan area. There are significant pharmaceutical companies and employers located within the region, but outside of the Trenton metro area that may be employing Princeton University foreign graduates to stay in the region after graduation. But to keep consistent to metropolitan areas, this analysis only calculated the percentage of OPTs staying the exact metropolitan areas as the school the foreign student graduated from, rather than a broader region.

94. The numerator of this ratio (number of OPTs granted to former foreign students on F-1s who attended school in the metropolitan area) does not necessarily translate to the same foreign student in the denominator. Since the ratio is of OPTs divided by foreign students on F-1 during the same 2008-2012 period, there may be

OPTs who were on an F-1 visa before 2008 and also current F-1s who are freshmen to juniors in college who have not attempted to apply for an OPT.

95. Neil G. Ruiz and Shyamali Choudhury, "Beyond H-1B: Other Avenues to Adding Skilled Workers," *The Avenue*, June 25, 2012, available at <http://www.brookings.edu/blogs/the-avenue/posts/2012/06/25-h1b-immigration-ruiz-choudhury>.

96. Neil G. Ruiz, "Immigration Facts on Foreign Students," Washington, D.C.: Brookings Institution, 2013, available at www.brookings.edu/research/interactives/2013/facts-on-foreign-students.

97. Neil G. Ruiz, Jill H. Wilson and Shyamali Choudhury, "The Search for Skills: Demand for H-1B Immigrant Workers in U.S. Metropolitan Areas," Washington, D.C.: Brookings Institution, 2012, available at: www.brookings.edu/metro/h1b.

98. Neil G. Ruiz, "America's Foreign Students and Immigration Reform," *UpFront*, April 9, 2013. Available at www.brookings.edu/blogs/up-front/posts/2013/04/09-foreign-students-ruiz.

99. "Should Foreign STEM Graduates Get Green Cards," *US News and World Report*, May 2012. Available at www.usnews.com/debate-club/should-foreign-stem-graduates-get-green-cards/us-stem-grads-more-innovative-than-their-foreign-counterparts.

100. Patrick Thibodeau, "Senate Dems aim to Staple Green Cards to Tech Diploms," *Computerworld*, April 30, 2010, available at www.computerworld.com/s/article/9176186/Senate_Dems_aim_to_staple_Green_Cards_to_tech_diplomas?taxonomyId=70&pageNumber=2.

101. For more information about the significance of exports to metropolitan economies see Emilia Istrate and Nicholas Marchio, "Export Nation 2012: How U.S. Metropolitan Areas are Driving National Growth," Washington, D.C.: Brookings Institution, 2012, available at: <http://www.brookings.edu/research/reports/2012/03/08-exports>.

102. Interview with Richard Drobnick, Director for Global Business Excellence and Center for International Business Education and Research (CIBER), USC Marshall School of Business, October 29, 2013.

103. Interview with Peter Koveos, Director of the Center for International Business, Syracuse University School of Management, November 1, 2013.

104. High demand H-1B metros are the 106 metro areas that were the focus of the author's previous study examining the geographic demand for H-1B workers in U.S. metropolitan areas. These metros are defined by having an average of at least 250 H-1B requests by employers in the 2010-2011 period. For more information, see Neil G. Ruiz, Jill H. Wilson and Shyamali Choudhury, "The Search for Skills: Demand for H-1B Immigrant Workers in U.S. Metropolitan Areas," Washington, D.C.: Brookings Institution, 2012, available at: www.brookings.edu/metro/h1b.

105. Neil G. Ruiz, Jill H. Wilson and Shyamali Choudhury, "The Search for Skills: Demand for H-1B Immigrant Workers in U.S. Metropolitan Areas," Washington, D.C.: Brookings Institution, 2012, available at: www.brookings.edu/metro/h1b.

SUMMARY

In an analysis of new data, Neil Ruiz tracks the local origins, size and growth rate of the foreign student population across the United States by metropolitan area. He finds that foreign students attending U.S. colleges and universities on the F-1 visa bring billions of dollars each year to local economies and hold the potential for forging greater economic connections between U.S. regions and fast-growing cities in emerging markets.