
LOCAL AND GLOBAL NETWORKS OF IMMIGRANT PROFESSIONALS IN SILICON VALLEY*

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INTRODUCTION

Entrepreneurship and globalization concern scholars and policymakers interested in economic transformation. However, researchers typically treat these phenomena in isolation. Most studies of entrepreneurship focus either on the attributes of individual entrepreneurs or on their connections to the local or regional environment.¹ Studies of globalization focus on multinational corporations and nation-states.² As a result, entrepreneurship and globalization are rarely linked.

Recent research suggests, however, that globalization and entrepreneurship are related: Foreign-born entrepreneurs are becoming agents of globalization by investing in their native countries, and their growing mobility is in turn fueling the emergence of entrepreneurial networks in distant locations. In Silicon Valley, for example, Taiwan-born entrepreneurs have built social and professional networks to support U.S. ventures, which they use to accelerate new firm in Taiwan.³ There is evidence of a similar process among Indian immigrant entrepreneurs,⁴ and scholars have begun to document emergence of strikingly similar transnational activities among Latin-American immigrants in the United States.⁵

We know little about the extent and contours of this phenomenon. In what ways are globalization and entrepreneurship linked? Do foreign-born counterparts? What role do ethnic networks play in the process of new firm formation? To what extent are first-generation immigrants creating transnational networks that link

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their native countries and the United States? What is the nature of these connections? Is the “brain-drain”-the migration of the best and brightest from poor to rich nations-accelerating, being reversed or being replaced by “brain circulation”. That is, are there more complex two-way flows of skilled workers between developed and less-developed economies?⁶

Policymakers, face challenges resulting from the increasingly open flows of skill, technology, and capital across national boundaries. These processes have transformed debates about trade, immigration policy, and intellectual property rights, forcing creation of new institutions and mechanisms for adjudicating conflicts. This study will help to identify significant, and often unanticipated, areas of policy concern.

This study contributes to our understanding of entrepreneurship, globalization, and their interrelations by documenting findings of the first large-scale survey of foreign-born professionals in Silicon Valley. The survey explores the scope and organization of the local and transnational networks constructed by the region’s immigrant engineers and scientists. It focuses on first-generation Indian and Chinese immigrants, the two largest groups of skilled immigrants in the region, and compares their participation in local and global networks to one another and to that of their U.S. born counterparts.

METHODS

Surveying foreign-born professionals is unusually difficult. Most daunting is developing a sampling frame because the target population (foreign-born engineers and other professionals) is difficult to identify and, once identified, difficult to reach.

We have only rough estimates of the population of immigrant professionals in a region, making difficult to determine representativeness survey. Nevertheless, we have attempted to maximize the study’s validity.

We estimate from Current Population Survey (CPS) data that there were about 320,000 professional workers in the high-technology sectors of the San Francisco Bay Area economy in 2000, including approximately 20,700 born in Greater China (Mainland, Hong Kong, and Taiwan) and 18,400 born in India. [The estimates of the representation of foreign-born workers in the Silicon Valley workforce are based on data on place of birth and employment from the Current Population Survey 1994-2000 sample for the five-country Bay Area (San Francisco, Oakland, and San Jose). The totals are calculated using employment

totals from the Bureau of Labor Local Area Statistics for San Jose, Oakland, and San Jose metropolitan statistical areas (MSAs). More recent data (1998-2000) suggest a substantial increase in Indian as well as Chinese high-technology, high-skill workers in the region; however, the sample size for the two-year period is too small for reliable estimates. Thanks to Peter Hall for his help with this analysis.]

The survey was deployed on the web because of the nature of this research—particularly its focus on computer-literature professionals. The relative lack of scholarly experience with web-based surveys led us to rely on the expertise of CustomerSat.com, an independent survey vendor in the San Francisco Bay Area, for this project.

We designed the survey questionnaire using insights gained from several years of interview-based research on immigrant entrepreneurship in Silicon Valley. In addition, a pretest was conducted with approximately 25 foreign-born professionals to identify any confusing or potentially misleading questions.

The sample was drawn from the membership of 17 leading immigrant professional associations in Silicon Valley. Foreign-born engineers, the great majority from China and India, mobilized these associations during the 1980s and 1990s, often in response to the experience of invisible barriers to professional advancement, or “glass ceilings,” in the region. However, these associations quickly became important forums for the mobilization of ethnic resources to support information exchange, career advancement, and entrepreneurship within the region’s immigrant communities. The associations that agreed to participate in the survey are among the largest and most active professional and technical associations in Silicon Valley, with memberships ranging from 500 to 5,000 (Saxenian, 1999).

The initial goal was for the associations to provide email addresses for all their members. Because many associations were concerned about preserving the confidentiality of their members, two methods of deployment were used. Six associations provided email membership lists directly to CustomerSat.com for deployment. Another 11 associations took the responsibility for sending the invitation to participate in the survey directly to their membership. In both cases, reminders were then sent out approximately two weeks after the initial invitation had been issued.

This sampling approach was our only available option, but it created two types of selection bias. Lists of association members used for the survey do not include all foreign-born professionals in the region, or even all the Indian and Chinese professionals. At most, these associations represent one-third of the Indian and Chinese immigrant population in Silicon Valley. [We estimate that out

of about 20,700 Chinese professionals in the area, approximately 7,500 Chinese immigrants are members of local professional associations. Their total association membership is 15,000, but most Chinese professionals belong to more than one association, so their numbers have been deflated accordingly. Likewise, 6,461 Indians are members of local professional associations out of approximately 18,000 Indian professionals in the region. This means that close to one-third of both Chinese and Indian immigrant populations in the region belong to professional associations. Some of these association members are U.S.-born Indians or Chinese.] Furthermore, the association lists do not represent random samples but rather the most active members of respective communities.

The survey was on-line for two months, between May 15 and July 12, 2001. CustomerSat.com sent out 10,837 invitations to participate in the survey and received 2,273 responses, a 21 percent responses rate. Although this rate is consistent with those of other business surveys in California, a higher response rate would provide greater confidence in the findings. Moreover, the response rate varied depending upon the method of deployment. The response rates for associations that sent survey invitations directly to their members ranged from 1 percent to 19 percent.

The representation of foreign-born Chinese and Indian workers in the survey is difficult to calculate because of data limitations. The survey sample includes 788 respondents from Greater China, or 3.8 percent of the region's total professional population from that region. Likewise, the sample includes 769 respondents from India, or a 4.2 percent of the Bay Area's estimated foreign-born Indian professional population. The representation of the other foreign-born (189) and U.S.-born (260) populations is substantially lower, with 0.3 percent of the former and 0.1 percent of the latter.

One consequence of our sampling strategy is that the results are biased toward immigrants who are members of professional associations. There is potential for bias as well from the self-selection of the respondents. These limitations are not as severe as they might be because the focus of this research is on immigrants who play active leadership roles in their respective communities, particularly in starting companies and building both local and long-distance networks. Previous research has demonstrated that these foreign-born entrepreneurs are responsible for substantial wealth and job generation in the region (Saxenian, 1999).

The largest groups of foreign-born respondents that are not treated separately here are those from Hong Kong (4 percent) and South Korea (2 percent). We lack a sufficient number of responses from either group to reliably

treat them separately, and except for the analyses of Greater China (which includes Hong Kong), they are included in the other foreign-born category.

There is also a sizable cohort of Asian-American respondents, particularly those who identify themselves as Indian-American (26 percent of U.S.-born respondents to the survey) and Chinese-American (17 percent of respondents). Unfortunately, these samples are not large enough to make reliable generalizations.

IMMIGRANT NETWORKS AND ENTREPRENEURSHIP

This study focuses on the three groups of foreign-born immigrant professionals—those from Taiwan, India, and China—in addition to the total population of foreign-born respondents. It illuminates important differences in the timing and nature of immigration for each of these groups along with notable similarities in their entrepreneurial and networking activities. Silicon Valley's foreign-born professionals appear to be quick to adopt the practices of information exchange and entrepreneurship that distinguish the regional economy. Survey respondents rely heavily on business associates as well as family and friends for business and technology information, and many are active participants in the process of new firm formation. Local institutions and social networks within ethnic communities are more important to entrepreneurial behavior than are national or individual characteristics.

Immigration Pathways

Data from the U.S. Census show that Taiwanese immigrants were the first large cohort of foreign-born engineers to settle in the United States, followed by Indians and, most recently, Mainland Chinese. The respondents to the survey mirror this pattern: Sixty-seven percent of the Taiwanese surveyed settled in the United States before 1990, compared to 42 percent of the Mainland Chinese.

A great majority of the Chinese and other foreign-born respondents came to work in Silicon Valley after attending graduate school in the United States. By contrast, almost half of the Indian respondents came to the United States via other paths. Seventy-nine percent of the Mainland Chinese and Taiwanese immigrants surveyed attended school in the United States before working compared to 54 percent of Indians. Conversely, 35 percent of Indian respondents were recruited by intermediaries or through work, compared to 14 percent of Mainland Chinese and 12 percent of Taiwan-born respondents.

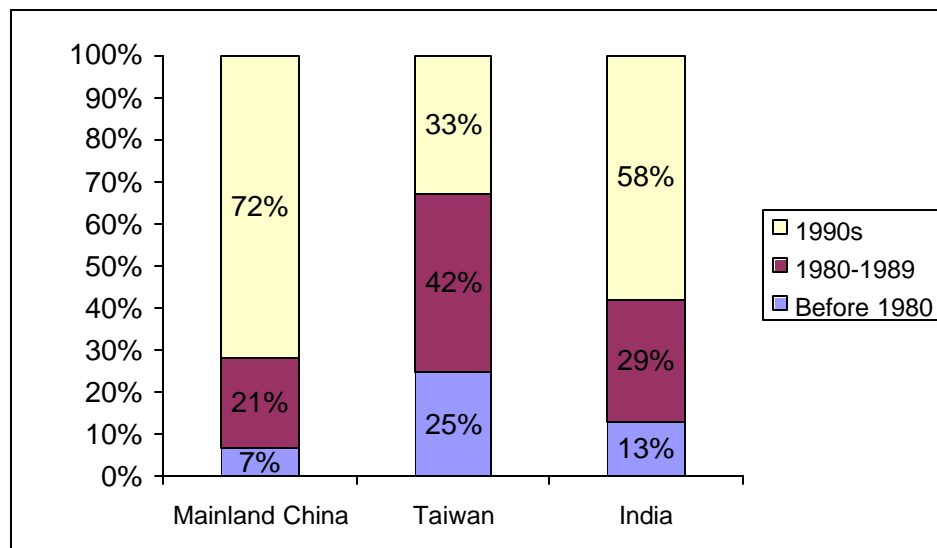


Figure 1—When Did You Settle in the United States?

Immigrant Entrepreneurs

First-generation immigrants to Silicon Valley appear to be active entrepreneurs. In spite of their relatively recent arrival in the United States, 52 percent of the survey's foreign-born scientists and engineers have been involved in founding or running a start-up company either full-time or part-time. Sixty percent of Indian respondents were involved in starting companies—almost the same rate as their native-born counterparts—whereas 51 percent of Taiwan-born and 32 percent of Mainland-born respondents had experience in working in start-ups, either part-time or full-time. Involvement in founding or running a start-up is strongly correlated with age, gender (male), and business education.

Data presented here likely overstate the level of entrepreneurship among the total foreign-born population because the sample is biased toward those who are active in the associational life of their communities. Entrepreneurship may be both a cause and a consequence of associational activity. All the associations surveyed for this report provide services and programs that foster entrepreneurship; some make it central to their mission whereas others do it to complement other professional and technical activities.

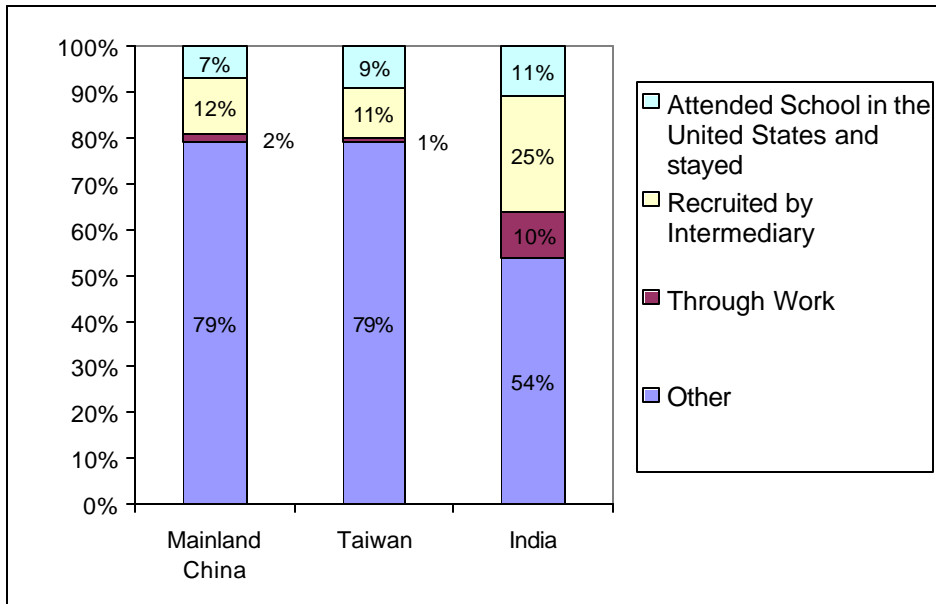


Figure 2—How Did You Come to Work in the United States?

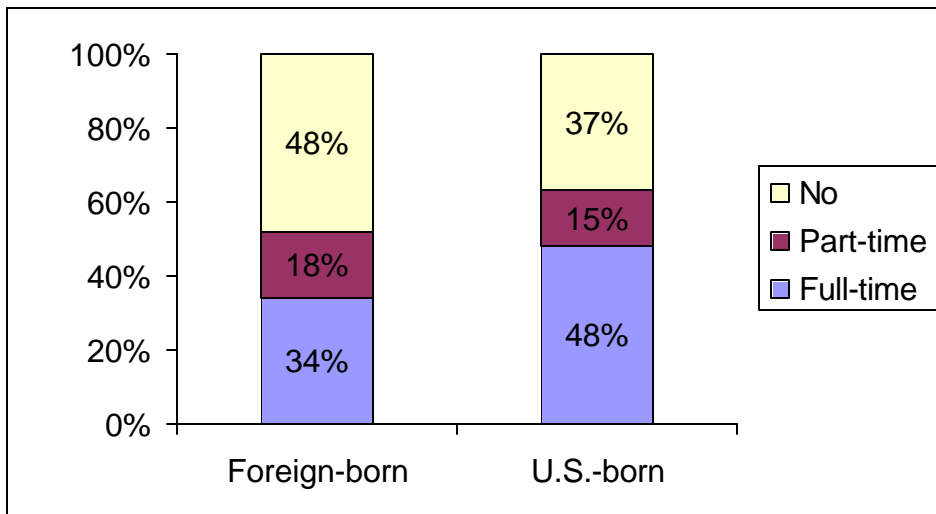


Figure 3—Have You Been Involved in Founding or Running a Start-Up Company?

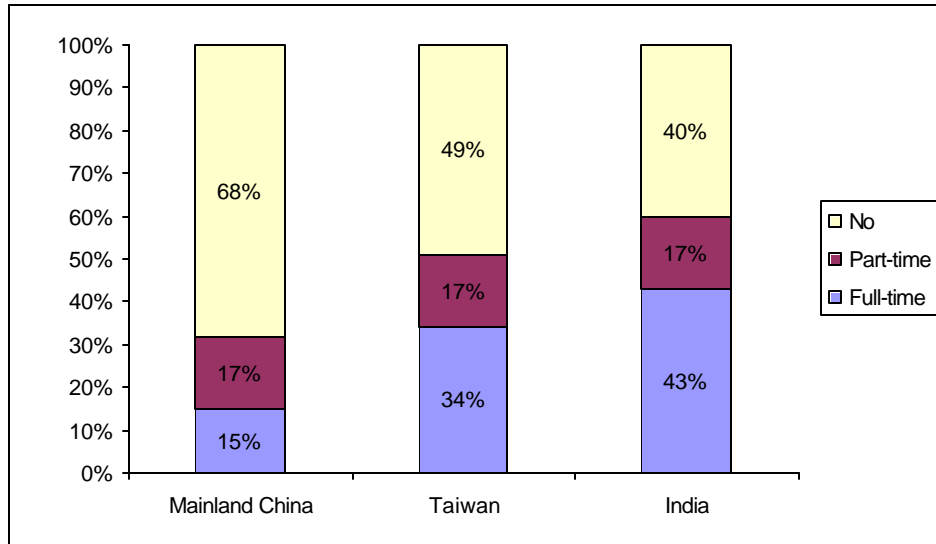


Figure 4—Have You Been Involved in Founding or Running a Start-Up Company?

Associational Activities

Starting a company in today's high-technology business environment requires ongoing access to external sources of information. Surprisingly the professional surveyed participate actively in local networks. Nineteen percent of foreign-born respondents attended professional, immigrant, and alumni association meetings once or more a month, and close to half attend such meetings between two and six times a year. Compared to their U.S. born counterparts, the Chinese and Indian respondents report lower rates of association attendance. Respondents from Taiwan and Mainland China attended more frequently than those born in Indian. The most active immigrants to Silicon Valley rapidly adopt the pattern of external networking and information exchange that distinguishes the region.

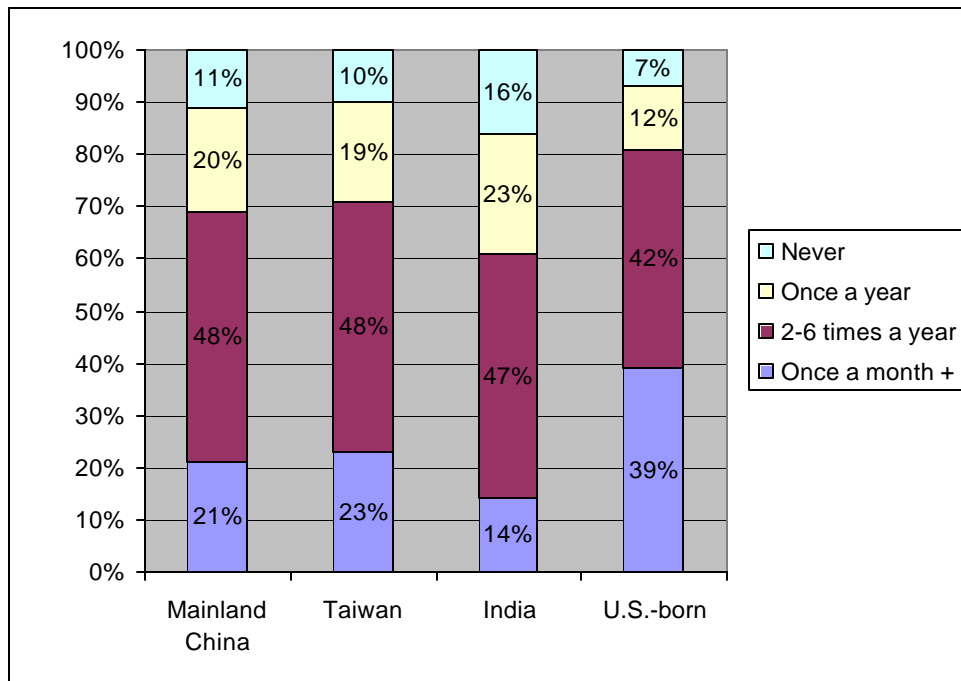


Figure 5—How Often Do You Attend Meetings of Professional, Immigrant, or Alumni Associations?

Immigrants from the Greater China region report attending meetings of alumni associations at least as frequently as professional or technical associations, with 29 percent reporting regular attendance. Their attendance at other meetings is spread among more than a dozen ethnic professional and technical associations.

Differences are reflected in the frequency with which respondents serve as officers or board members of professional and immigrant associations. Whereas 26 percent of the U.S. born professionals surveyed have served as offices or board members compared to 14 percent of all foreign-born, only 8 percent of Indian immigrants have served as board members or officers compared to 23 percent of immigrants from Taiwan and 11 percent of those from Mainland China.

Both associational attendance and officer-level participation correlate closely with age: Approximately 20 percent of survey respondents under the age of 50 attend associational meetings once or more per month, compared to 38 percent of those over age 50.

Sources of Information

Both immigrants and U.S.-born professionals in Silicon Valley report that business associates are one of their most important sources of business and technology information. Seventy-three percent of U.S.-born and 67 percent of foreign-born respondents ranked “business associates” as a very important source of information. [Respondents were asked to rank sources of information on a ten-point scale, with 10 = extremely important and 1 = not important. The “very important” category here includes all rankings 8-10.]

This confirms the importance of importance of informal networking in the region—particularly its high ranking as a source of information for U.S.-born and foreign-born respondents as well, with the “general business media” ranking second, followed by “professional and business associations” and “family members and friends.” A very few foreign-born or U.S.-born respondents found “media targeted toward immigrants” as an important source of information.

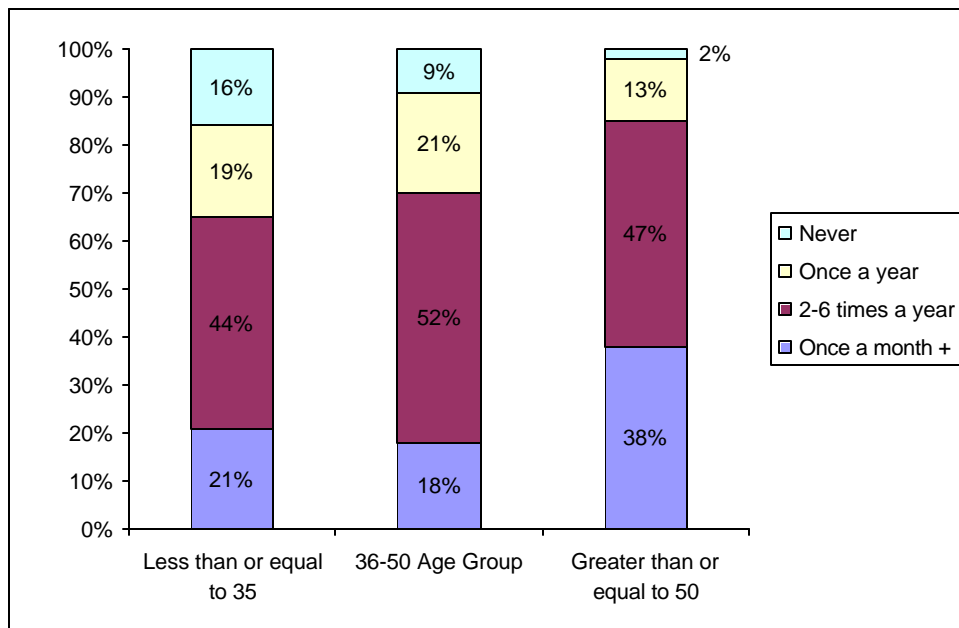


Figure 6—How Often Do You Attend Meetings of Professional, Immigrant, or Alumni Associations?

There are differences of scale between the Indian and Chinese immigrants on this question. A very large percentage of the Indian community (74 percent) rates business associates as a very important information source compared to 57 percent of those born in Greater China. The difference could well be due to the language difficulties that recent Chinese arrivals face in the United States. However, business associates are the top-ranked source of information for Chinese as well, even though the absolute rankings differ. Similarly, both Indian and Chinese respondents rank the general business media almost as high as business associates as an information source—a significant difference from their U.S.-born counterparts.

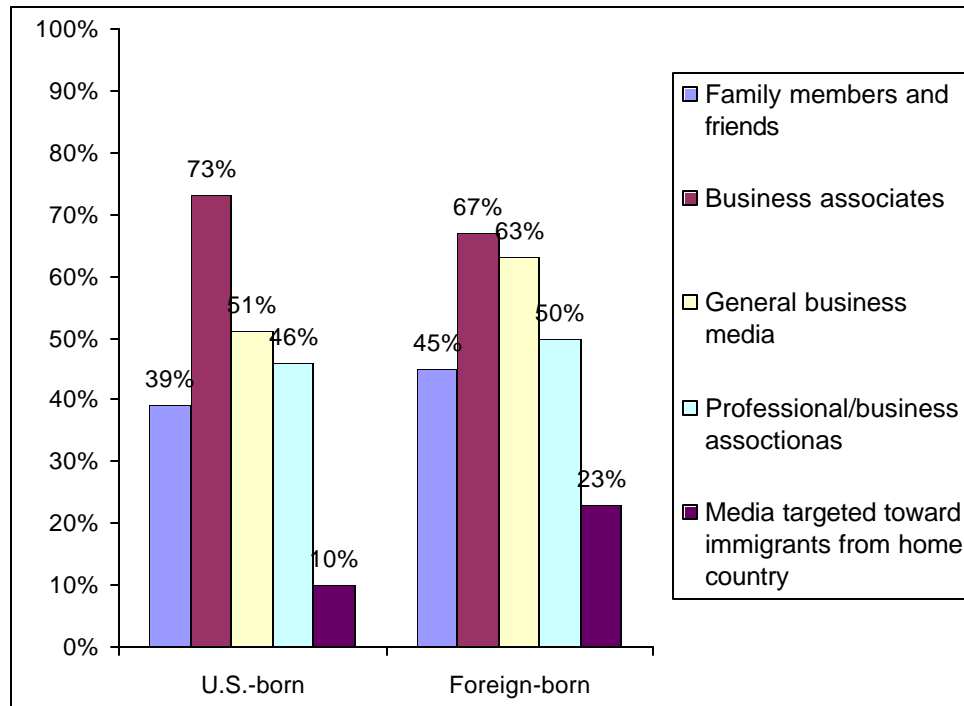


Figure 7—Very Important Sources of Technology and Business Information

Professional associations and family and friends appear as important information sources for immigrants in Silicon Valley: 50 percent of foreign-born respondents ranked professional associations as “very important.”

Only 45 percent of foreign-born respondents rank friends and families as “very important” sources of business and technology information. However, there is significant variation, with 52 percent of Mainland Chinese respondents ranking family and friend as “very important” compared to 44 percent of Indian immigrants and 39 percent of U.S.-born respondents. This pattern is consistent with the research literature, which stresses the relative importance of family in Chinese business and social life. However, only 37 percent of Taiwan-born respondents rank family and friend as “very important,” slightly lower than reported by the U.S.-born population.

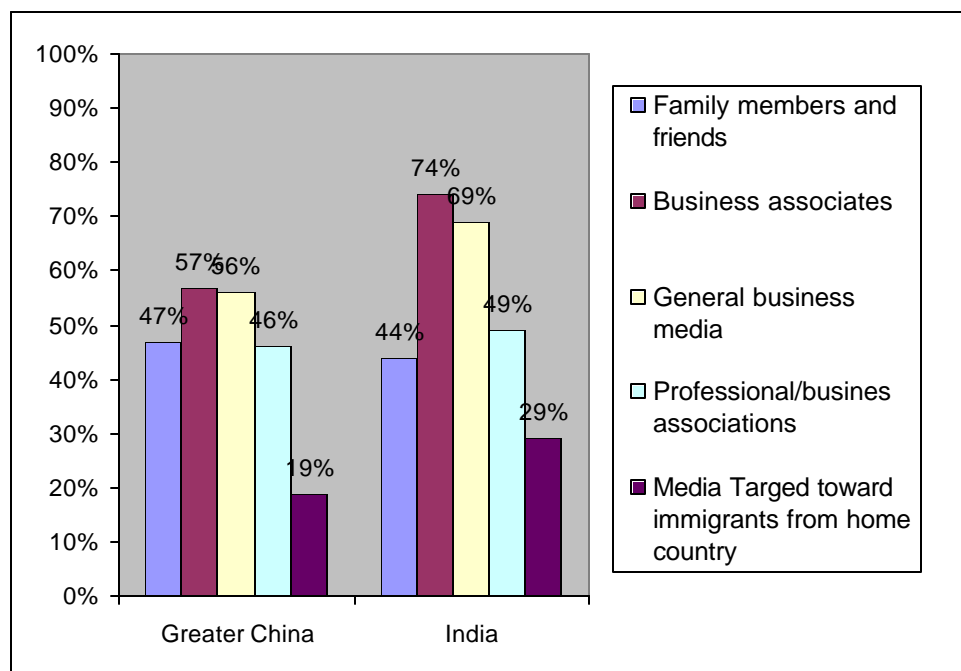


Figure 8—Very Important Sources of Technology and Business Information

Entrepreneurial Intentions

Although this survey was administered during one of the most unfavorable times for financing start-ups in the recent history of Silicon Valley, 62 percent of the foreign-born respondents said that they plan to start their own companies. This rate is significantly higher than the 46 percent reported by U.S.-born respondents who plan to start companies. Likewise, only 7 percent of the foreign-born say that they will never start a company compared to 13 percent of those in the United

States. Indian immigrants appear to have the greatest entrepreneurial ambitions: 74 percent report plans to start a business compared to 53 percent of Chinese immigrants.

Not only are these immigrants entrepreneurial but they also appear interested in becoming transitional entrepreneurs: 73 percent of the foreign-born professionals who plan to start a company say that they would consider locating their business in their country of birth. Seventy-eight percent of Mainland Chinese and 76 percent Indian respondents would consider locating their businesses in their native countries.

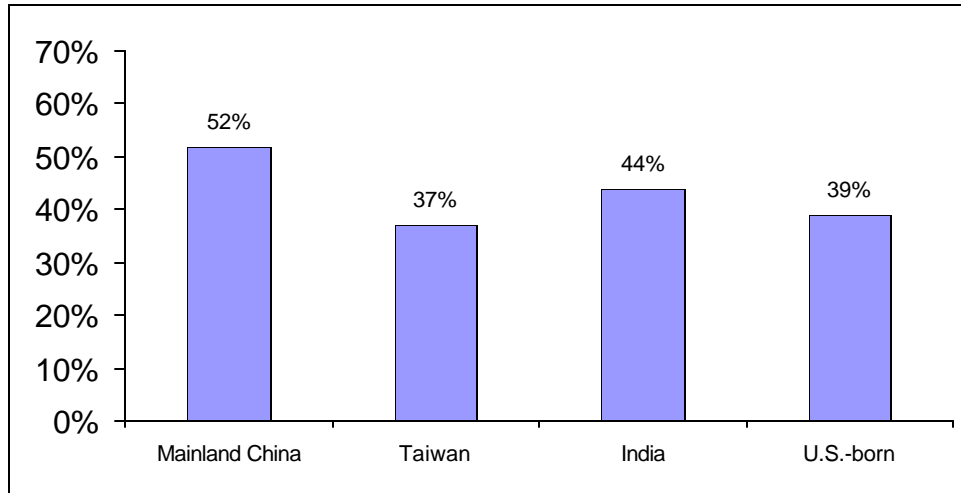


Figure 9—Percentage of Respondents Ranking Family Members and Friends as a Very Important Source of Technology and Business Information

TRANSNATIONAL TECHNICAL COMMUNITIES

Silicon Valley's foreign-born engineers and other professionals maintain strong ties to their native countries. These ties are clearly facilitated by advances in telecommunications and transportation. However, the extent and nature of these connections suggest that economic connections between Silicon Valley and such places as Taiwan, India, and China do not conform to the standard image of globalization as dominated by multinational corporations. Immigrant professionals in Silicon Valley regularly travel home for business and to exchange information with colleagues in their native countries. (Often these colleagues are friends who have returned from the United States.) They also arrange business contracts in their native countries. Some even advise or invest in companies and meet frequently with government officials abroad. Many would consider returning to live in their country of birth, particularly if appropriate professional opportunities were available.

Returns, Astronauts, and Information Exchange

Most highly skilled Chinese and Indian immigrants in Silicon Valley have at least one friend or colleague who has returned to his or her native country to work or start a company. Seventy-three percent of Indian and 68 percent of Chinese respondents say that they know between one and ten returnees, and 4 percent of Indians and 9 percent of Chinese know ten or more. Forty-five percent of the other foreign-born respondents know of no such returnees. The transnational ties between Silicon Valley and Greater China and India are better developed than those elsewhere, perhaps because of the larger size of the Chinese and Indian professional population in Silicon Valley.

The differences within the Chinese community are also meaningful: only 13 percent of Taiwanese respondents know no one who has returned home and 17 percent know ten or more. By contrast, 25 percent of Mainland Chinese surveyed know no returnees and only 6 percent know ten or more. This pattern likely reflects the more recent arrival of the Mainlanders in the United States. It also underscores the unusually large number of Taiwanese returnees in the past two decades—a phenomenon that is often described as a reversal of the brain drain.

Half of Silicon Valley's foreign-born professionals report traveling to their native country for business at least yearly, and 5 percent of those surveyed make the trip five times or more per year. The latter are known among local Chinese as "astronauts" because they appear to spend their lives in airplanes. Again, the Taiwanese stand out: 20 percent returned home for business two to four times a year compared to 9 percent of Indians and 8 percent of Mainland Chinese.

With large numbers of returnees and high rates of business travel between Silicon Valley and their native countries, it is no surprise that there is substantial information exchange within these immigrant communities. Eighty-two percent of the region’s foreign-born respondents report that they share information about technology with colleagues in their native countries (and 28 percent do so on a regular basis), 80 percent share information about jobs and business opportunities in the United States (24 percent do so regularly), and 69 percent share information about jobs or business opportunities in their native country (14 percent regularly). Respondents were asked to rank how often they share information on a ten-point scale, with 10 = frequently and 1 = never. “Sometimes” includes rankings 5-7 and “regularly” includes rankings 8-10.

Indian respondents report sharing information about technology most frequently, whereas Mainland Chinese and Taiwanese report exchanging information about jobs and business opportunities in the United States and about technology at about the same frequency. Chinese and Indians exchange information about jobs and business opportunities in their native countries the least frequently; 30 percent never exchange such information.

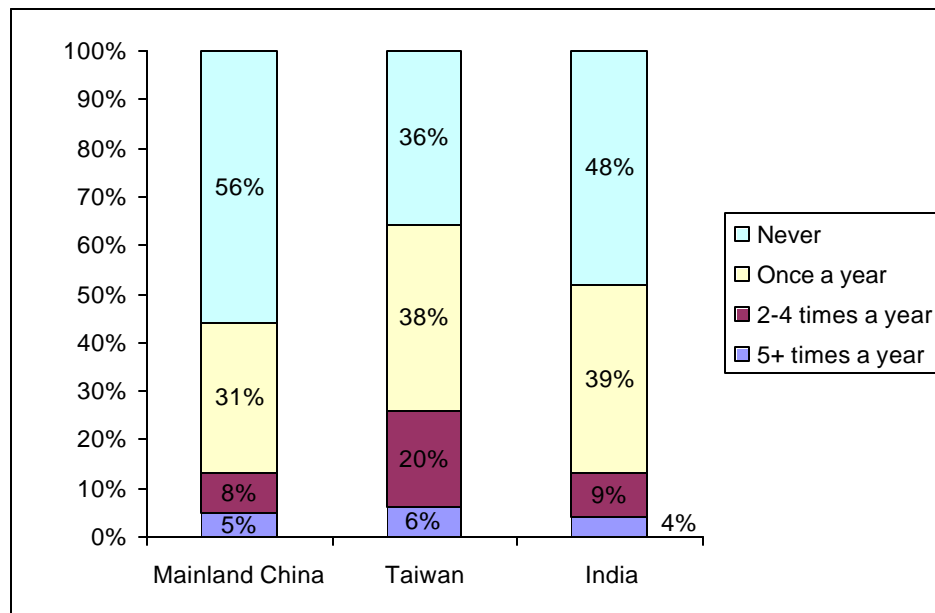


Figure 10—How Often Have You Traveled to Your Country of Birth for Business Purposes, on Average, in the Past Three Years?

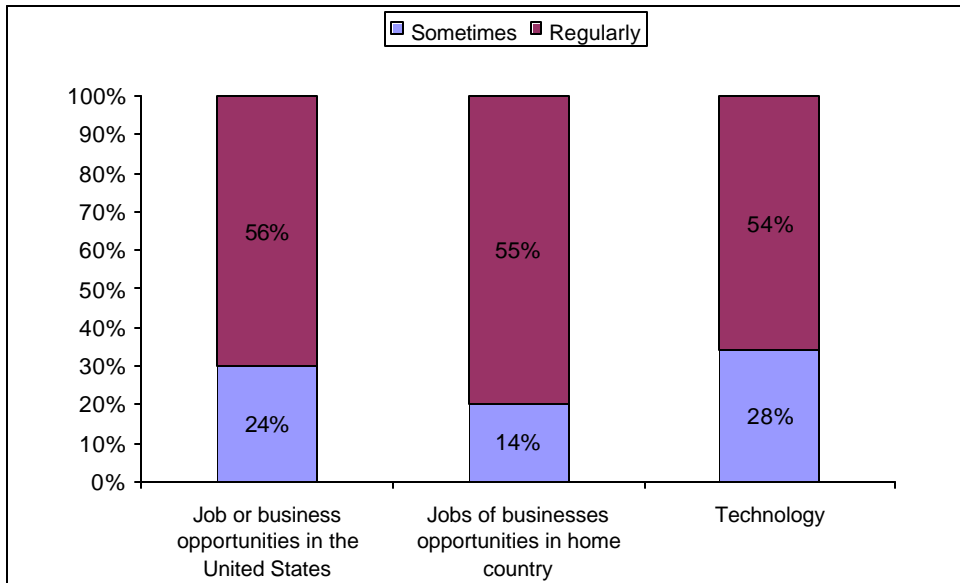


Figure 11—How Often Do You Exchange the Following Types of Information with Friends, Classmates, or Business Associates in Your Country of Birth?

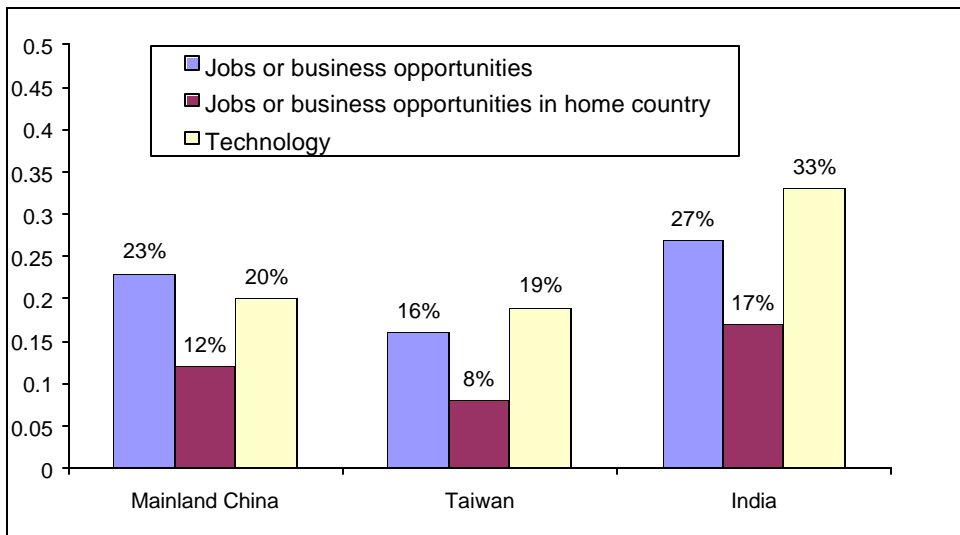


Figure 12—Percentage of Respondents Reporting Regular Exchanges of Information with Friends, Classmates, or Business Associates in Their Country of Birth

Consulting, Arranging Contracts, Investing, and Meeting with Government with Government Officials

Silicon Valley immigrants' connections to their countries of birth go beyond travel and information exchange. Twenty-seven percent of foreign-born respondents report serving as an advisor or consultant for companies from their country of birth. This includes 34 percent of Indian respondents, 24 percent of Taiwanese, and 15 percent of those from Mainland China.

An even greater share (40 percent) of foreign-born respondents report helping to arrange business contracts in their native country, including 46 percent of Indians, 42 percent of Taiwanese, and 35 percent of Mainland Chinese. These numbers undoubtedly overstate the level of advising and contract arrangement in the foreign-born population, but they provide valuable insights into the activities of those immigrants who are most directly involved in the economics of their native countries. The likelihood of Indian or Chinese immigrants helping to arrange business contracts for companies in their native country is closely correlated with age.

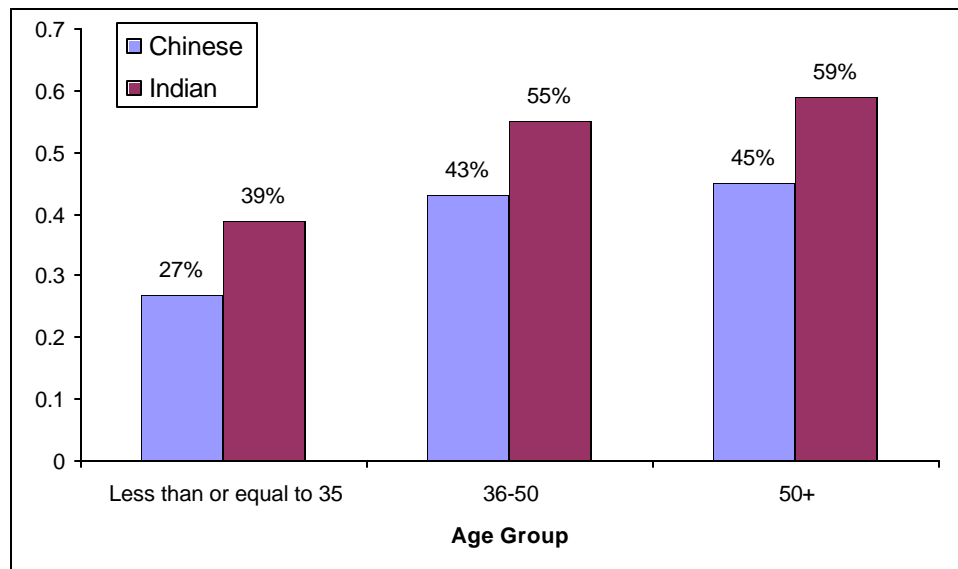


Figure 13—Percentage of Respondents Who Have Helped Arrange Contracts for Companies in Their Country of Birth

Investing in start-ups or venture funds involves a greater commitment than consulting and arranging contracts, so it is especially striking that 18 percent of the foreign-born professionals responding to the survey have invested their own money in start-ups or venture funds in their native countries. Indian immigrants, in particular, report making investments at the same rate as their U.S.-born counterparts (22 percent) compared to the smaller numbers of Taiwanese (17 percent) and Mainland Chinese (10 percent).

Once again, the tendency to invest correlates closely with age, with 36 percent of Indian and 27 percent of Chinese respondents age 50 and over investing their own money in their native countries.

Silicon Valley immigrant professionals also meet frequently with government officials from their native countries. Thirty percent of the survey's foreign-born respondents participate in such meetings sometimes, and 4 percent do so on a regular basis. Interestingly, 35 percent of the respondents from Mainland China meet sometimes or regularly with government officials compared to 26 percent of Taiwanese and 27 percent of Indian immigrants.

Although the survey did not ask specifically about the substance of these meetings, interviews suggest that they typically involve attempts by government officials to attract investments, encourage the return of Silicon Valley individuals and companies, or obtain advice concerning financial and regulatory conditions in the native country. Once again, older immigrants are significantly more likely to meet regularly with government officials than their younger counterparts.

There is a core group of more experienced and older immigrants in Silicon Valley who are actively involved not only in the local associational life and in starting local companies but also in building connections to their native countries. These activities include not only consulting and arranging contracts but also advising government officials and investing money in companies and venture funds.

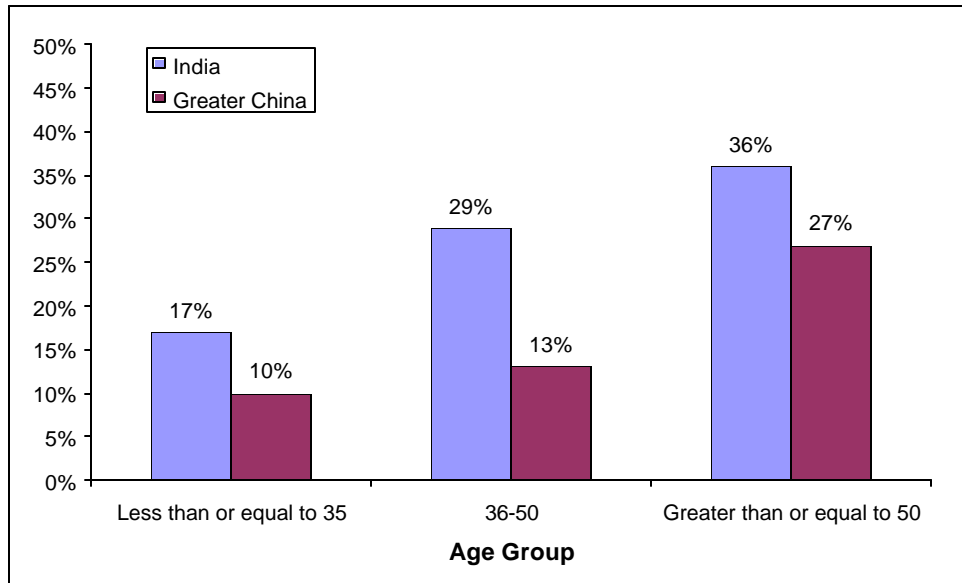


Figure 14—Percentage of Respondents Who Have Invested Their Own Money in Start-Ups or Venture Funds in Their Country of Birth

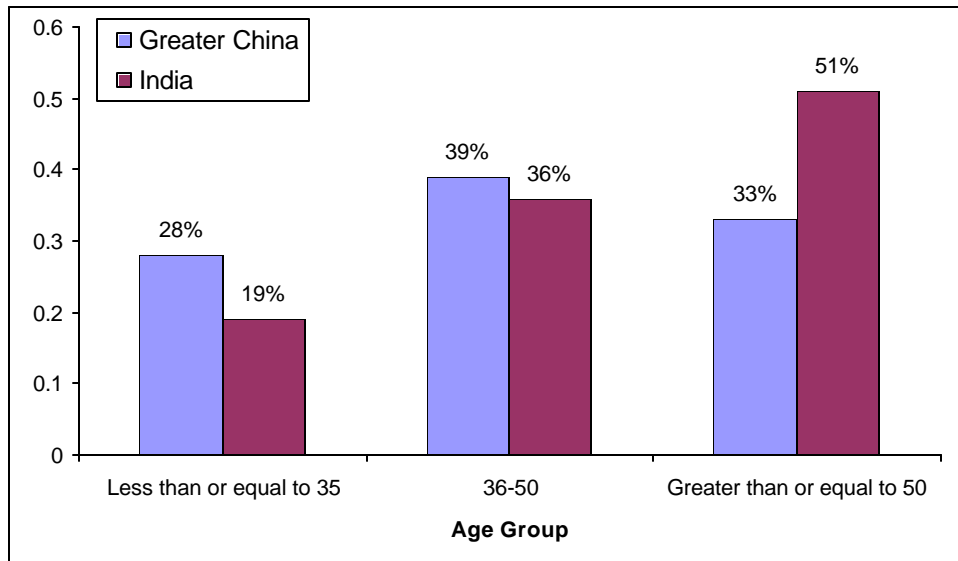


Figure 15—Percentage of Respondents Who Meet with Government Officials from Their Country of Birth

Return Home Permanently?

Foreign-born professionals often regard Silicon Valley as a temporary home. Forty percent of all foreign-born respondents would consider returning to live in their country of birth in the future: 18 percent say it is “quite likely” and 22 percent say it is “somewhat likely.” There is little difference between Mainland Chinese and Indian respondents, with 43 percent and 45 percent, respectively, saying it is likely they will return home permanently, whereas only 25 percent and 32 percent say it is unlikely.

Age is, once again, a significant predictor: 50 percent of foreign-born respondents under age 35 say it is likely they will return home in the future compared to only 23 percent of those age 50 or older. The older an immigrant, the more difficult it is to return to his or her country of birth live because of the accumulation of family and other commitments in the United States.

Nor are these results significantly altered by immigration status. Whereas U.S. citizens are likely to consider returning to their native country than other immigrants, 46 percent of permanent residents (green card holders) and more than 50 percent of immigrants with other visas, including H1-Bs, are likely to consider returning home in the future. The differences between these groups are undoubtedly affected by age: More than 70 percent of green card holders are over age 35 compared to only 42 percent of permanent residents.

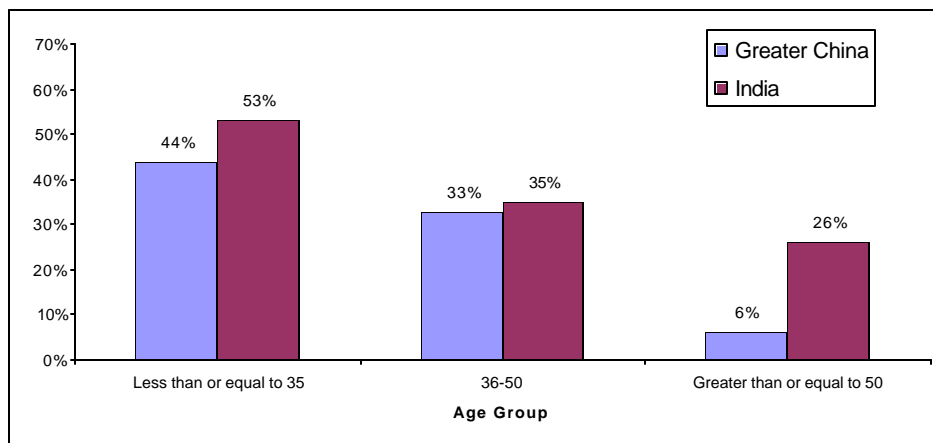


Figure 16—Would You Consider Returning to Live in Your Country of Birth in the Future?

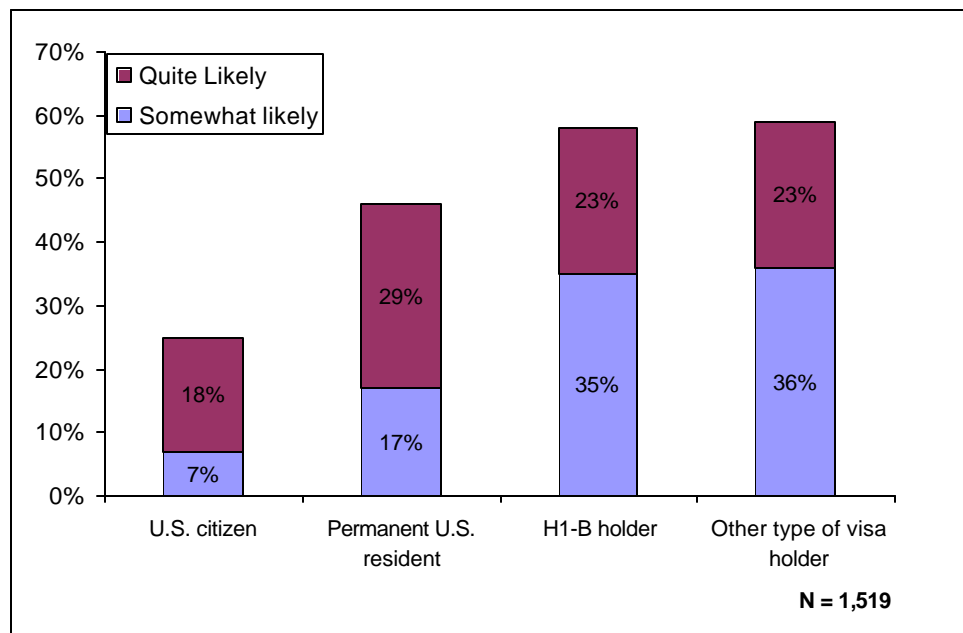


Figure 17—Would You Consider Returning to Live in your Country of Birth in the Future?

Silicon Valley’s high-skill immigrants rank “professional opportunities in country of birth” (7.97) and “culture and lifestyle in country of birth” (7.81) as the two most important factors shaping their decision to return to live in their native countries. The numbers in parentheses are the mean score for a particular factor using a ten-point scale, with 1 = not important and 10 = extremely important. And though they consider “limits on professional advancement in the United States” (5.66) to be important, this factor is ranked significantly lower than others by all foreign-born respondents.

The aggregate rankings mask small but interesting differences between Chinese and Indian respondents on the question of repatriation. Silicon Valley’s Chinese immigrants rank “professional opportunities” (8.27) and “culture and lifestyle” (7.4) as the most important factors, followed by both “desire to contribute to economic development” (6.68) and “government treatment of returnees” (6.65). By contrast, Indian immigrants rank “culture and lifestyle” (8.25) as the most significant factor followed by “desire to contribute to economic development” (7.81) and “professional opportunities” (7.75). The importance accorded by Indian immigrants to the “culture and lifestyle in country of birth” is also confirmed in interviews.

More than 500 foreign-born respondents wrote in comments when asked to specify other important factors influencing their decision to return to live in their countries of birth. The majority (60 percent of Indians and over 40 percent of Chinese) cited family-related issues—including primarily relationships with parents and relatives, education for children, and the need for family consensus—as among the most important factors shaping their decision to return to their country of birth in the future.

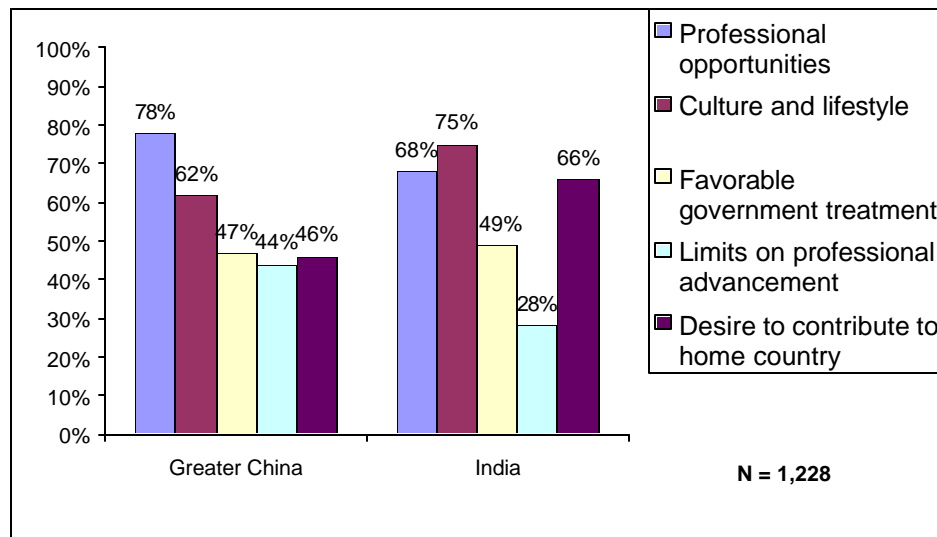


Figure 18—Factors Ranked as Very Important in the Decision to Return to Live in Country of Birth

THE GLOBALIZATION OF ENTREPRENEURSHIP

Silicon Valley’s skilled immigrants are starting their own companies at an increasing rate, and they frequently take advantage of their privileged access to markets low-cost skill, and other resources in their native countries. This section focuses on the one-quarter of respondents who are running start-up companies, 83 percent of whom are foreign-born. There is little difference in the ways that these immigrants and their U.S.-born counterparts start companies: The majority (foreign-born and U.S.-born alike) incorporate their firms in the United States, almost all raise money from personal savings and angel investors initially and from venture capital firms subsequently, and their firms tend to go public at the same rate as companies started by U.S.-born entrepreneurs.

Evidently, highly skilled immigrants have learned the Silicon Valley model of entrepreneurship quickly. These engineers have successfully adopted both the technological capability and the venture-financed, high-growth business model that distinguishes many U.S. firms in the high-technology sector. They have also established global connections very quickly. Half of Silicon Valley's foreign-born entrepreneurs in this survey have set up subsidiaries, joint ventures, subcontracting, or other business operations in their native countries—and the most of other half would consider establishing such operations in the future. These operations are concentrated in a small number of fast-growing urban areas, and their specialties reflect those of the economies of these locations. In the Greater China region, these firms are primarily involved in marketing, sales, and hardware design and manufacturing; in India, the focus is primarily on software or content development and software services.

In short, immigrant entrepreneurs in Silicon Valley are transferring elements of the Silicon Valley business model to their native countries. By exploring their linguistic and cultural advantages, they are ideally positioned to draw on the distinctive skills bases and other resources of these distant places. In the process, they are seeding new centers of entrepreneurship and technology growth in formerly peripheral regions of the world economy.

Starting a Silicon Valley Company

The pace of entrepreneurship increased dramatically during the 1990s among both foreign-born and U.S.-born entrepreneurs. More than 75 percent of the technology start-ups in this sample were founded since 1995, and almost 90 percent since 1990. The great majority (91 percent) of companies founded by foreign-born immigrants have been incorporated in the United States.

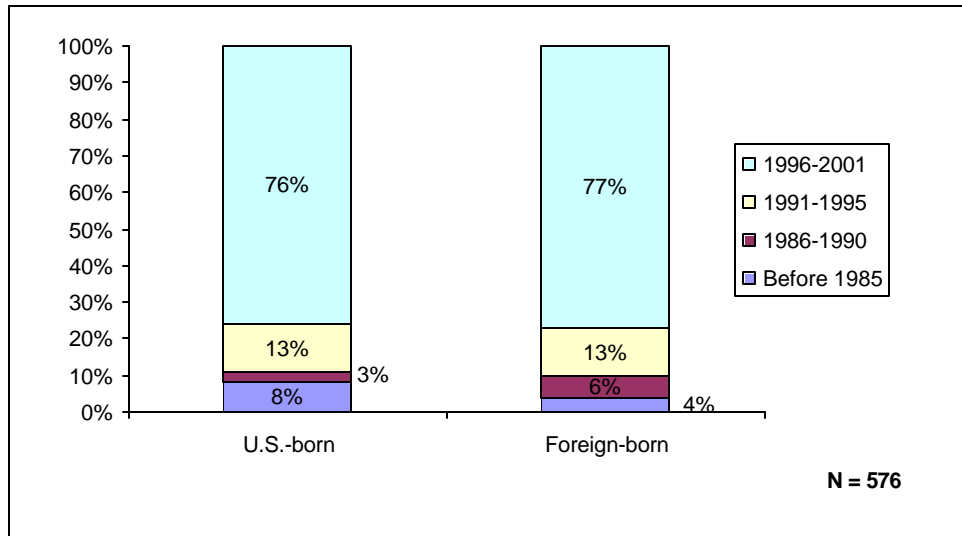


Figure 19—In What Year Was Your Company Incorporated?

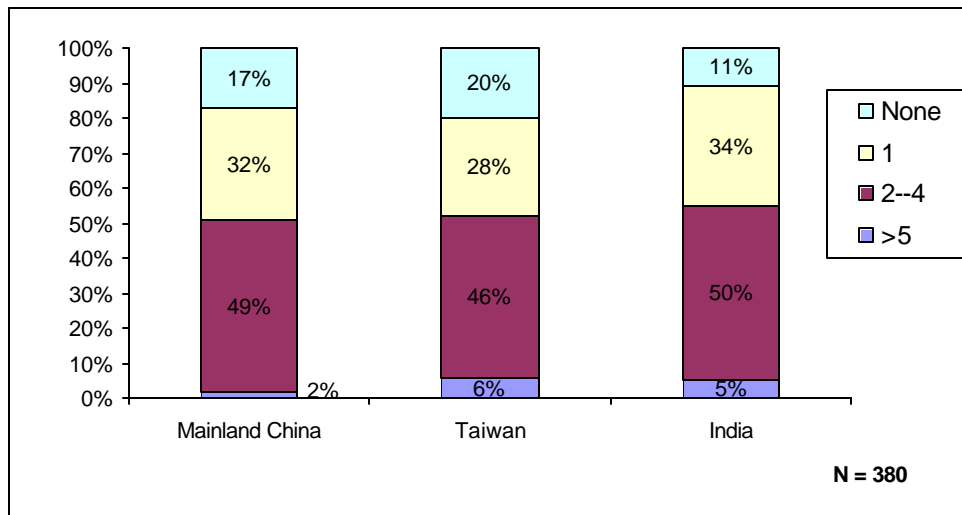


Figure 20—How Many of the Original Founders of the Company Are From Your Country of Birth?

And whereas 40 to 50 percent of these entrepreneurs report starting businesses with two or four co-founders from their native countries, only a handful (6 percent or less) have five or more founders that were born in the same country.

Although immigrant may rely heavily on friends and colleagues from their native countries to start companies—this seems to be especially true of the Indian community—the ethnic dominance decreases steadily as companies grow.

The financing of start-ups for immigrants appears quite similar to that for U.S.-born entrepreneurs. Both groups depend on personal savings and angel investors for their initial funding and primarily on venture capital for subsequent rounds of funding.

There is also little difference in the amounts of money raised. Foreign-born entrepreneurs have been more successful fund-raisers, although the differences between groups are quite small.

U.S.-born and foreign-born entrepreneurs report that the most significant difficulty they face when raising capital is “access to investors.” Almost half (47 percent) of foreign-born entrepreneurs have difficulty gaining access to investors, but 39 percent of U.S.-born entrepreneurs also rank it as their most significant problem.

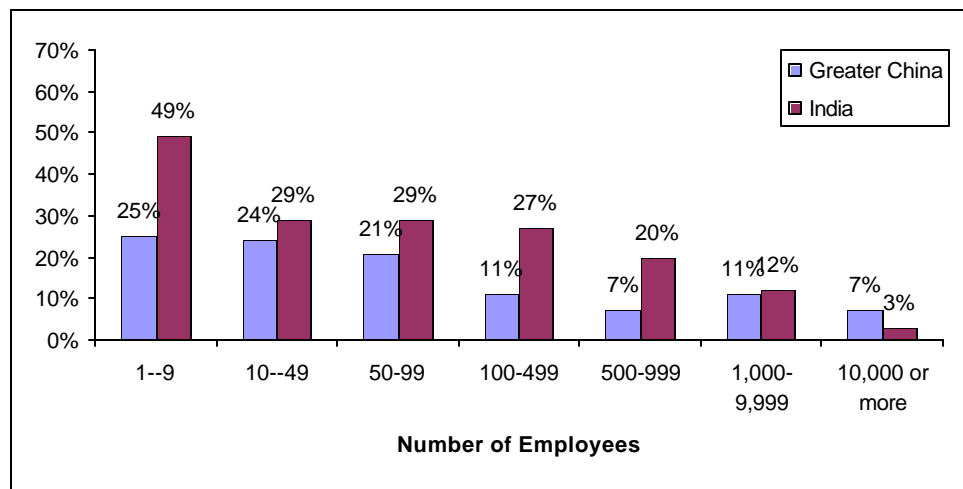
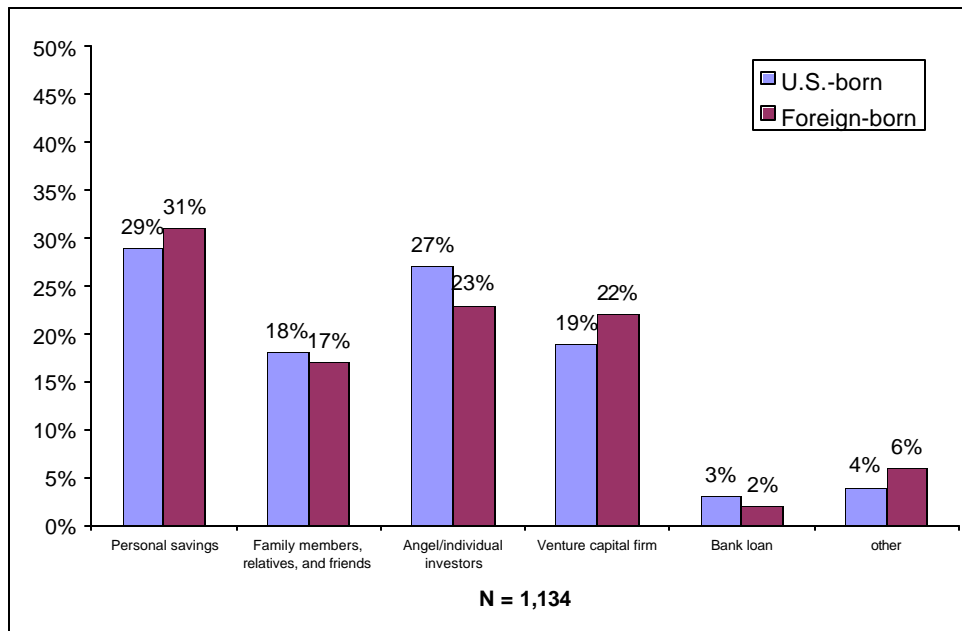
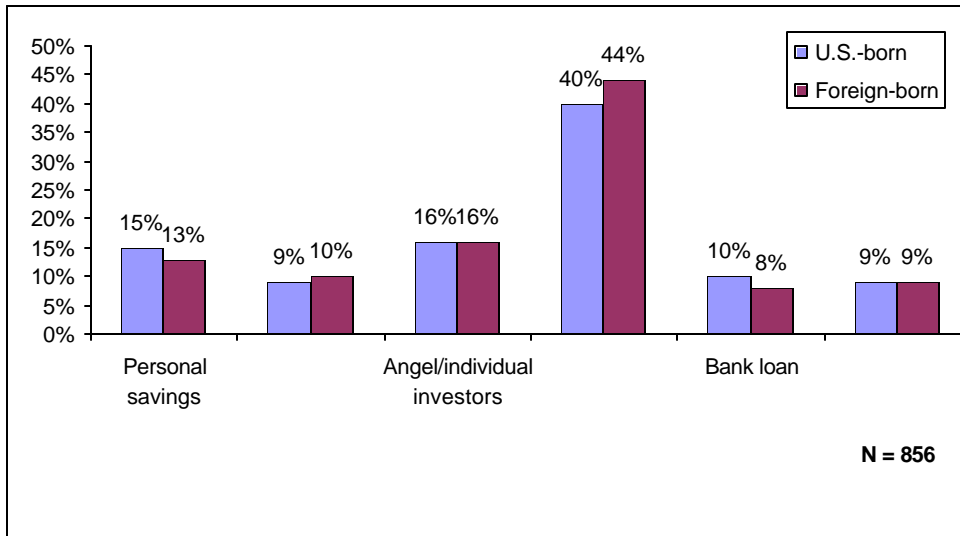


Figure 21—Percentage of Companies with More Than 50 Percent of Its Full-Time Employees from Founder’s Country of Birth



NOTE: "Other" includes corporate and government funding.

Figure 22—Sources of Initial Capital for Start-Up Companies



NOTE: Other includes corporate and government funds raised through an initial Public offering.

Figure 23—Sources of Subsequent Funding for Start-Up Companies

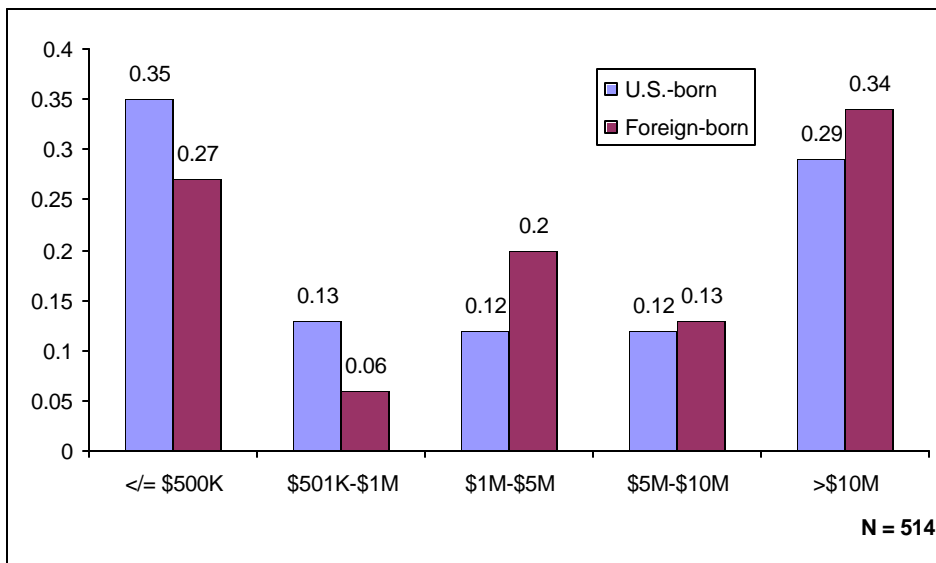


Figure 24—How Much Capital has the Company Raised to Date?

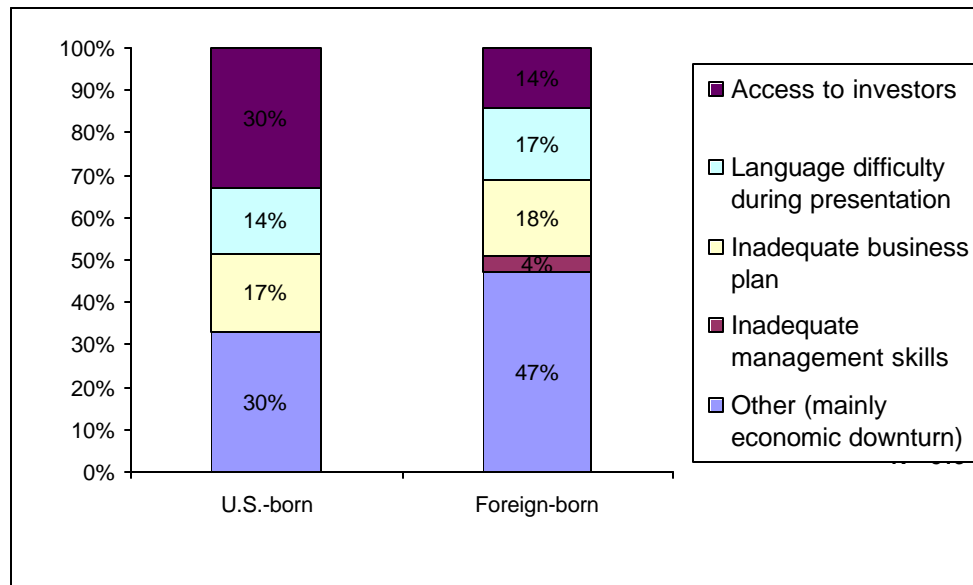


Figure 25—What, If Any, Difficulties Have You Faced Raising Capital?

When asked to specify “other” difficulties that they experienced in raising capital, a majority of respondents cite the market turndown and economic uncertainty. Finally, both foreign-born and U.S.-born entrepreneurs rely most on “friends and family” to help raise money, with current or former colleagues ranking second (although of equal importance to friends and family for those born in the United States) and professional associations ranking a distant third.

The immigrant-founded companies are publicly listed at the same rate (16 percent) as those run by U.S.-born entrepreneurs; however, only 75 percent are listed in the United States, with the balance listed in India (11 percent), Greater China (5 percent), and elsewhere outside the United States.

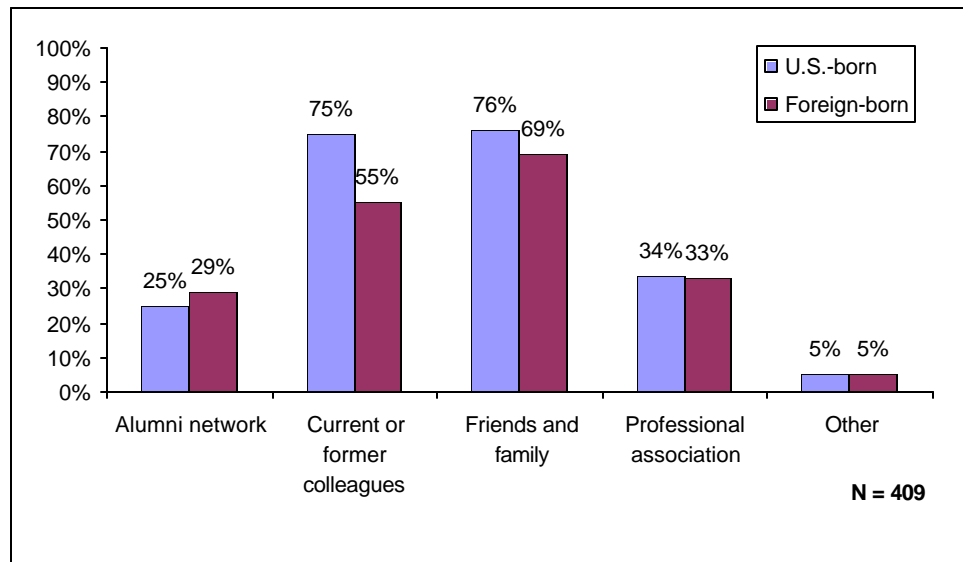


Figure 26—Have Any of the Following Networks Helped You Overcome These Difficulties in Raising Capital?

Transnational Entrepreneurs

Silicon Valley's immigrants are often transnational entrepreneurs from the start. Half the foreign-born entrepreneurs in the survey report business relations in their native countries, including 54 percent of those born in Greater China, 52 percent from India, and 41 percent of the other foreign-born respondents. Some 87 percent of these business relationships were established after 1990, but earlier generations of immigrant entrepreneurs also have business relations in their native countries, albeit on a smaller scale. Those who travel most frequently between Silicon Valley and their native countries are more likely to be involved in founding or running start-ups: 70 percent of Chinese and 80 percent Indians who have been involved in start-ups travel to their native country for business five or more times per year.

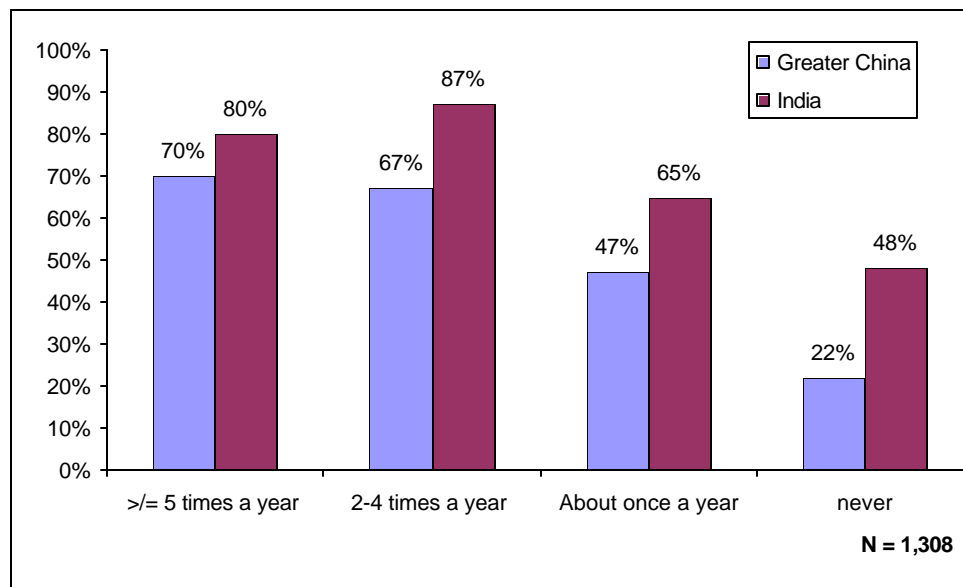


Figure 27—Percentage of Respondents Involved in Funding or Running a Start-Up Company, by Frequency of Business Travel to Country of Birth

Greater China

The business relationships established by Silicon Valley entrepreneurs are concentrated in a small number of fast-growing urban centers, much like the start-up companies; and once again, the activities reflect the specialties of the economics in which they are located. In Greater China, these business relationships are centered in Taiwan (42 percent), Beijing (22 percent), Shanghai (16 percent), and Guangzhou/Shenzen (12 percent).

Most of these relationships are organized as partially or fully owned subsidiaries (33 percent), marketing and distribution centers (33 percent), or joint ventures or partnerships with local companies (19 percent). The work performed in Greater China is dominated by marketing and sales (38 percent), hardware design and manufacturing (19 percent), and software services (16 percent). I also includes smaller amounts of software or content development (14 percent) and research and development (10 percent).

Silicon Valley entrepreneurs report that the main attractions of doing business in Greater China include access to the market (mentioned by 75 percent

of respondents), the low cost of labor (46 percent), and the availability of skilled workers (36 percent).

The survey asked respondents to list the three main problems that their business face in Greater China. Although we received fewer than 100 responses to this question, the following factors are the most frequently mentioned in diminishing order: Immature market conditions, Government bureaucracy and regulation, Political or economic uncertainty, and Inadequate legal protection, such as intellectual property rights.

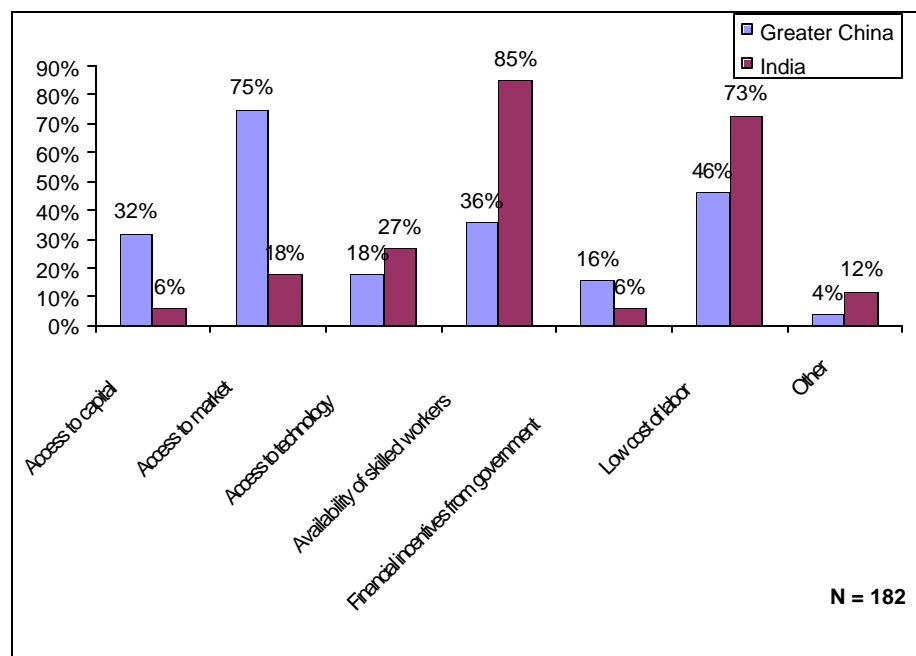


Figure 28—Select the Key Factors That Influenced Your Decision to Set Up Business Relationships in Your Country of Birth

India

Indian entrepreneurs from Silicon Valley have concentrated their business relationships in five major urban areas in the south of India: Bangalore (28 percent), Bombay (17 percent), Chennai (13 percent), Hyberbad (13 percent), and Pune (9 percent).

Most relationships are organized as partially or fully owned subsidiaries (37 percent), subcontractors or materials and parts suppliers (28 percent), or joint ventures or partnerships (16 percent). The majority of the work performed in India is software or content development (32 percent), software services (29 percent), research and development (18 percent), back-office or remote services (9 percent), or marketing and sales (8 percent).

Factors influencing the decision to establish business relationships in India were availability of skilled workers (mentioned by 85 percent of the respondents) and the low cost of labor (73 percent). No other single factor was identified by more than 27 percent of the respondents.

When asked about the most significant problem they faced doing business in India, survey respondents most frequently cited the unreliable infrastructure—including power, telecommunications, and transportation (mentioned by 30 percent of respondents). Government bureaucracy and regulation ranked as a distant but significant second area of concern (16 percent). Both immature market and poor business services (such as banks, accounting firms, and legal services) were mentioned by 11 percent of respondents.

Future Transnational Activities?

Most of the foreign-born entrepreneurs in Silicon Valley who do not yet have business relationships or operations in their native countries would consider setting them up in the future. Indians indicate the most interest (69 percent would consider it and only 5 percent would not), but there is also significant interest from respondents from Greater China (57 percent would consider it, 11 percent would not). Business ties between Silicon Valley and Greater China and India will continue to increase.

When asked where they would consider locating these future business operations, both Indian and Chinese entrepreneurs report that they are attracted to the existing geographic concentrations, although the rankings by the respondents from Greater China differ from their current concentrations. The majority of Indians would base their business relationships in Bangalore (41 percent) or Bombay (17 percent), whereas the Chinese overwhelmingly report a preference for Shanghai (45 percent) and Taiwan (41 percent).

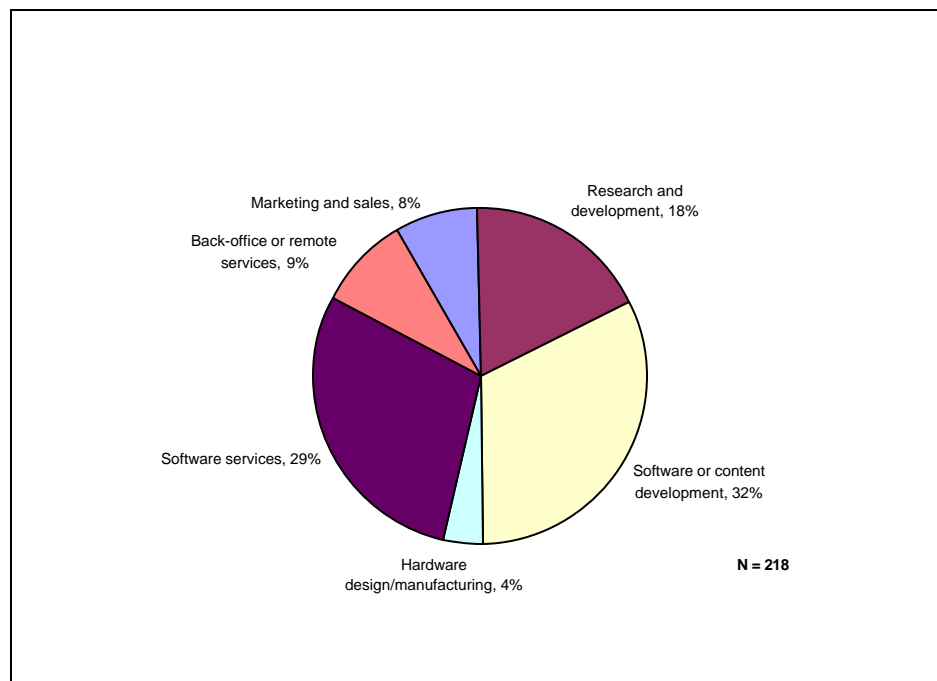


Figure 29—Nature of Business Operations in India

These transnational activities are likely to stimulate the growth of return entrepreneurship. The majority of Silicon Valley’s Indian (76 percent) and Chinese immigrants (73 percent)—particularly those in the younger age groups—consider starting a business in their country of birth in the future.

Most foreign-born respondents (65 percent) cite availability of skilled labor as one of the most important factors shaping the decision to locate a business in their country of birth. They rank it significantly above all other factors, followed by lifestyle (mentioned by 51 percent of those foreign-born) and access to markets (50 percent). For Indians, the availability of skilled workers is overwhelmingly the most cited factor (73 percent) shaping their decision to start a business in India. Lifestyle (58 percent) and access to technology (52 percent) rank as distant followers. Chinese immigrants, on the other hand, most frequently identify access to markets (61 percent) and availability of skilled labor (56 percent) as the leading factors shaping their decision to locate a business in Greater China, followed by access to capital (50 percent). The cost of labor is important to only 29 percent of all foreign-born respondents, the lowest of all factors. This result underscores the extent to which foreign investment, at least in the high-technology

sector, is motivated in the current era more by the research for skilled labor than by the search of lower costs.

Of course, these immigrants also report important problems that might deter them from starting a business in their native country. For Indians, the unreliable infrastructure (mentioned by 74 percent of respondents) and government bureaucracy and regulations (mentioned by 73 percent) overwhelm all other factors as potential deterrents to starting a business in India. For the Chinese, government bureaucracy and regulations rank first (mentioned by 58 percent of respondents), followed by an inadequate legal system (48 percent), and political or economic uncertainty (46 percent), as factors that would deter them from starting a company in Greater China.

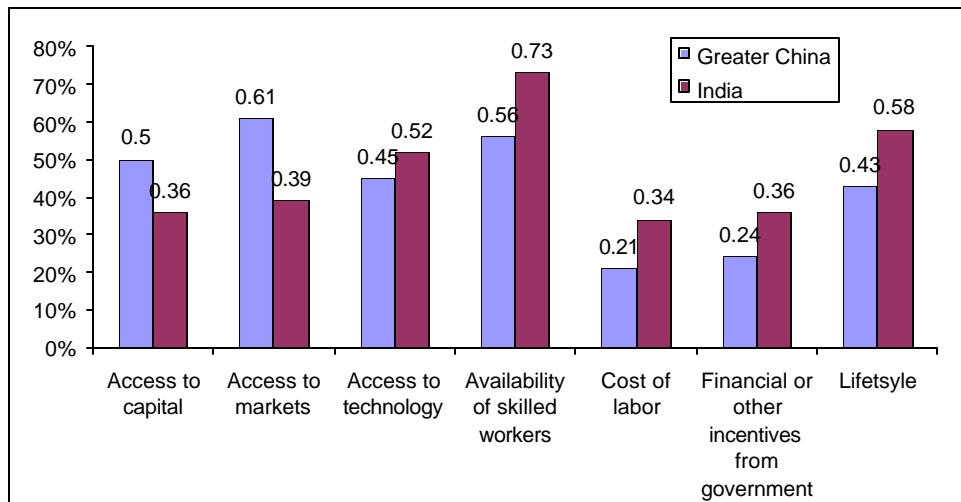


Figure 30—Which Factors Would Figure Most Importantly in Your Decision to Start a Business In Your Country of Birth?

At this point the limits to the expansion of transnational activities, including return entrepreneurship, lie almost primarily in the domestic context of the countries of origin. Although a majority of Silicon Valley’s highly skilled immigrants are willing to consider returning home to work or start a business, government regulations and related political-economic uncertainty, on one hand, and the institutional (legal system for China) and physical infrastructure (power, roads, and telecommunications for India) on the other, may prove limiting factors.

Yet even if there is no reversal of the brain drain as in Taiwan, it seems likely that the brain circulation between Silicon Valley and such regions as Bangalore, Bombay, Beijing, and Shanghai will continue, and possibly accelerate, with far-reaching effects on the economies of India and China. In the long run, the combination of brain circulation and return entrepreneurship could create sufficient economic opportunities to diminish the numbers of youth leaving these countries. However, the challenges of widespread poverty and uncertain politics in India and China, along with the greater educational and economic opportunities in the United States, suggest that the brain drain will continue into the foreseeable future.

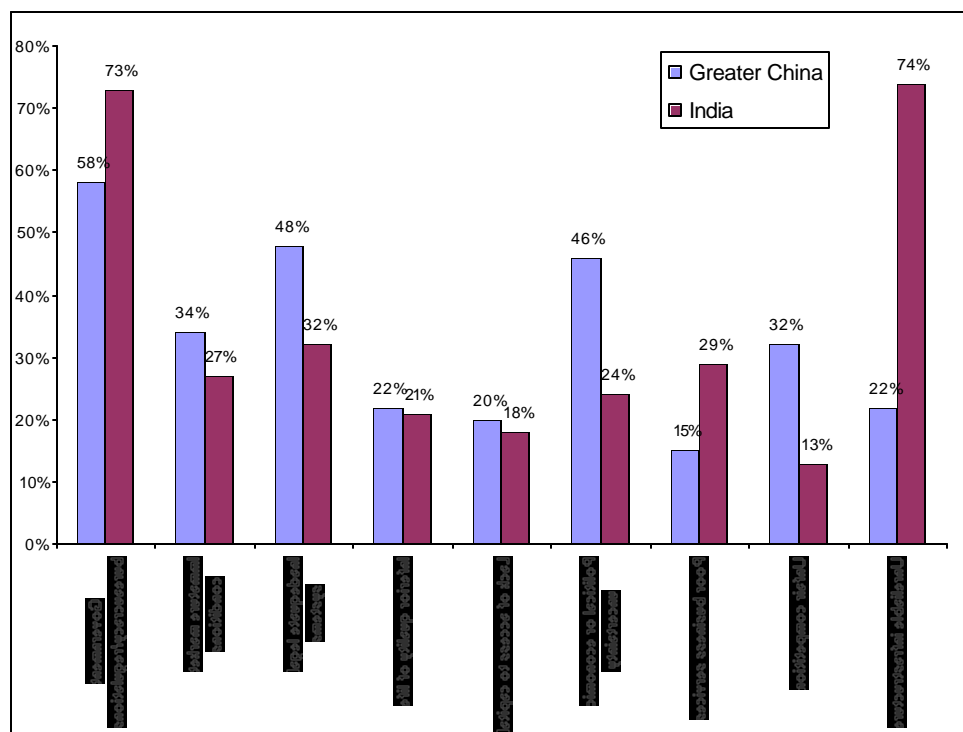


Figure 31—What Problem Areas Would Deter You From Starting a Business in Your Country of Birth?

POLICY DIRECTIONS

The scale and decentralized nature of the transnational activities linking Silicon Valley and regions in China, Taiwan, and India provide important new challenges for policymakers and researchers. Most current policies in the areas of

intellectual property rights, economic development, and immigration assume far more limited and one-way flows of skill and technology—largely within multinational corporations. This bottom-up globalization of entrepreneurship will demand creative new approaches to policy at both state and national levels. Although detailed policy recommendations are beyond the scope of this report, some consequences are worthy of consideration.

State and local policymakers concerned with economic development need to recognize the growing importance of relationships with local entrepreneurs—foreign-born as well as U.S.-born—and their professional associations in addition to the traditional ties to more established business. Local governments can play an important role in building bridges between both mainstream and ethnic professional networks as well as between the different ethnic associations in their jurisdictions. There are associations representing Japanese, Vietnamese, Iranian, Irish, Israeli, and French professionals in Silicon Valley (in addition to the Chinese, Indian, and Korean associations discussed in this report), but the communication between these groups remains limited, at best.

Policymakers might establish forums that facilitate interaction between these traditionally separate communities—and help them to articulate their shared problems as well as to jointly develop solutions. Through this process, policymakers can learn more about measures they might undertake to improve the local context for entrepreneurship, ranging from improvements in physical infrastructure or language training to facilitating relationships with the venture capital community or local researchers.

Local and state governments are the most appropriate scale for building cross-national relationships that parallel the bottom-up transnational networks that immigrants are building between the United States and their native countries. Economic activity, particularly information-technology-related entrepreneurship, is highly localized everywhere in the world. Regional governments in such places as India and China are closest to, and most aggressive in promoting, technology-related entrepreneurship and growth. This fact suggest that coordination between these lower levels of government in different countries (rather than at the national level) may be an effective way to both facilitate and monitor many of the transnational activities of immigrant professionals and their communities.

Of course some of the policy challenges arising from these changing economic relationships—especially those relating to intellectual property rights and immigration policy—will continue to be best addressed at the national level. However, a wide range of issues relating to education and training, corporate incorporations and location, monitoring of worker health and safety standards, environmental quality, venture capital flows, and even certain types of taxation,

might best be addressed at these regional and state levels. For example, governments in the San Francisco Bay Area might work with Shanghai to monitor health and safety risks in the semiconductor industry or with governments in Bangalore to coordinate standards for software training institutions.

¹ For examples of the best recent literature on entrepreneurship, see R. Swedberg, ed., *Entrepreneurship: The Social Science View*, Oxford, England: Oxford University Press, 2000, and C.B. Schoonhoven and E. Romanelli, *The Entrepreneurship Dynamic: Origins of Entrepreneurship and the Evolution of Industries*, Stanford, CA: Stanford University Press, 2001.

² The literature on globalization is vast, but two recent texts are representative of this emphasis on the actions of the state and of global corporations: D. Held et al., eds., *Global Transformations: Politics, Economics and Culture*, Stanford University Press, 1999, and P. Dicken, *Global Shift: Transforming the World Economy*, 3rd edition, New York: Guilford Press, 1998.

³ See A. Saxenian and J. Hsu, "Transnational Communities and Industrial Upgrading: The Silicon Valley-Hsinchu Connection," *Industrial and Corporate Change*, Vol. 10, No. 4, 2001.

⁴ Jonathan Thaw, "Asian-Indians in Silicon Valley: The Economic and Social Networks That Link Communities," master's thesis, Department of Geography, Oxford, England: Oxford University, June 2000.

⁵ A. Portes, "Introduction: The Debates and Significance of Immigrant Transnationalism," *Global Networks*, Vol. 1, No 3, 2001, pp. 181-193.

⁶ For the emerging literature on these subjects, see James Rauch and Vitor Trindade, "Ethnic Chinese Networks in International Trade," *Review of Economics and Statistics*, forthcoming; James Rauch, "Business and Social Networks in International Trade," *Journal of Economic Literature*, Vol. 39, No 4, December 2001, pp.1177-1203; Jean M. Johnson and Mark C. Regets, "International Mobility of Scientists and Engineers to the United States-Brain Drain or Brain Circulation?" *National Science Foundation Issues Brief*, NSF 98-316, Washington, D.C., 1998.