Local and Global Networks of Immigrant Professionals in Silicon Valley

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Foreword

In 1994, Berkeley professor AnnaLee Saxenian published a path-breaking work called *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. In that book, she documented for the first time the links between the exchange of information among Silicon Valley firms, their flexible networking arrangements, and the remarkable success many of these firms enjoyed. These links, she maintained, were the key to Silicon Valley's victory over Boston's Route 128 in the high-tech race of the 1980s. Saxenian also found that the circulation of people and money from abroad was a factor that contributed to the success of these Bay Area firms. Her findings attracted the interest of regional planners, economic development directors, foreign investors, and corporate leaders, all of whom were eager to know what secret ingredient had sparked the information revolution of the late 20th century.

PPIC commissioned Saxenian to follow up on her idea that a substantial share of the astounding growth in Silicon Valley could be traced to the labor and capital of foreign nationals. In 1999, PPIC published *Silicon Valley's New Immigrant Entrepreneurs*, in which Saxenian noted that Chinese or Indian immigrants led 24 percent of all Silicon Valley firms and that foreign-owned firms accounted for 14 percent of the region's total employment. The level of foreign ownership surprised many observers, but the report also added a new dimension to the notion of California immigrants as low-skill, entry-level workers. These findings quickly became common knowledge in California and the nation and among investors worldwide.

In 2000, PPIC once again commissioned Saxenian to return to Silicon Valley, this time to look at the networks that emerge as immigrants move in and out of the high-tech marketplace. This report is the result of that effort and, once again, her findings help define California's unique place in the global economy. Saxenian demonstrates that informal networks are still the secret to the region's success and that

the circulation of immigrant professionals between Silicon Valley and urban centers in China and Asia is promoting global economic change both here and abroad. With this latest report, Saxenian makes an important contribution to a richer understanding of Silicon Valley and what it takes to be a modern information complex.

Saxenian's findings are especially rewarding given the role PPIC's founding donor played in the history of Silicon Valley. The garage Bill Hewlett and David Packard used to launch their company is more than an advertising icon. It is the essence of long-term success—a start-up company with a solid idea, creative engineering, and a flexible and high-skill labor force. Saxenian's work has affirmed that these basic ingredients are still the key to success in Silicon Valley.

David W. Lyon
President and CEO
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Summary

Entrepreneurship and globalization are central concerns of 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. Studies of globalization focus primarily on the behavior of multinational corporations and nation-states. As a result, entrepreneurship and globalization are rarely linked in either scholarship or policy.

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. Yet we know little about the extent and contours of this phenomenon.

Policymakers, in turn, face new challenges resulting from the increasingly open flows of skill, technology, and capital across national boundaries. These processes have already transformed debates about trade, immigration policy, and intellectual property rights, and they are forcing the creation of new institutions and mechanisms for adjudicating conflicts.

This study contributes to our understanding of the globalization of entrepreneurship by documenting the 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. Focusing on first-generation Indian and Chinese immigrants (from both Mainland China and Taiwan), the largest groups of skilled immigrants in the region, it compares their participation in local and global networks both to one another and to that of their U.S.-born counterparts.

The sample for the survey was drawn from the memberships of 17 leading immigrant professional associations in Silicon Valley. The survey was conducted on the web because of the nature of this research—particularly its focus on highly computer-literate professionals. Although web-based surveys are still used primarily by corporations for market research and remain in their infancy for scholarly research, they have significant advantages for surveys of professionals who are comfortable with computers and more likely to respond on the web than through the mail or over the telephone. Furthermore, the cost of deployment and analysis of a large-scale web-based survey is substantially lower than that for a telephone or mail survey because of the minimal costs of electronic distribution and because responses are entered directly into a database rather than hand-coded. This method also eliminates potential sources of error associated with the manual entry of survey data.

The survey was on-line for two months, between May 15 and July 13, 2001. CustomerSat.com sent out 10,837 invitations to participate in the survey and received 2,273 responses, a 21 percent response rate. The sample includes 12 percent U.S.-born and 88 percent foreign-born respondents. Of the foreign-born, 43 percent were born in India, 30 percent in Mainland China, 12 percent in Taiwan, and the remaining 15 percent were born in other countries—including 11 percent from elsewhere in Asia. The number of responses to particular questions may vary because some respondents did not answer every question or failed to complete the survey and because the branching points within the survey narrowed the base for some questions.

This method of deployment means that there are potential sources of bias in the survey, particularly toward those who are association members and active members of the immigrant community. There is also some potential for bias resulting from the self-selection of the respondents. However, these sources of bias need not seriously compromise the findings reported here as long as we recognize that they are not representative of the entire population of foreign-born professionals. The focus of this research is on the behavior of highly skilled immigrants who are most likely to start companies and to play leadership roles in building local and global networks in their respective communities.

The survey addresses three central issues: the involvement of Silicon Valley's foreign-born professionals in the region's associational life and entrepreneurial economy, the nature of the professional connections that first-generation immigrants are building to their native countries, and the extent to which immigrants are becoming transnational entrepreneurs and establishing business operations in their native countries. The main findings are:

- First-generation immigrants to Silicon Valley, most of whom have entrepreneurial experience, quickly adopt the patterns of external networking and information exchange that distinguish U.S.-born professionals in the region.
- Chinese and Indian immigrants have a wide range of professional ties to their native countries. Many return to their native countries regularly for business purposes and exchange technology and labor market information with colleagues and friends. Some also advise companies, invest in start-ups and venture funds, and meet with government officials in their native countries.
- The timing, location, and financing of start-ups founded by immigrants suggest that their businesses differ little from those started by U.S.-born entrepreneurs. However, many foreign-born entrepreneurs have set up operations in their native countries to gain access to low-cost labor and, in the case of China, access to its domestic market.

The survey presents substantial evidence that the "brain drain" from developing countries such as India and China has been transformed into a more complex, two-way process of "brain circulation" linking Silicon Valley to select urban centers in India and China. Although there is little evidence of a reversal of the brain drain such as that seen in Taiwan in the early 1990s, the professional and business links between California and these distant regional economies are developing quickly. The scale and decentralized nature of these transnational activities have important consequences for economic development elsewhere in the world, as well as for the formulation of policy regarding trade, immigration, and

intellectual property rights in the United States. However, these topics are beyond the scope of this study.

Contents

Foreword iii
Summary v
Figures xi
Tables xv
Acknowledgments xvii

1. INTRODUCTION AND OVERVIEW OF THE STUDY 1

2. DATA SOURCES AND METHODOLOGY 5

3. IMMIGRANT NETWORKS AND ENTREPRENEURSHIP 11
   Immigration Pathways 11
   Immigrant Entrepreneurs 12
   Associational Activities 15
   Sources of Information 16
   Entrepreneurial Intentions 19

4. TRANSNATIONAL TECHNICAL COMMUNITIES 23
   Returnees, Astronauts, and Information Exchange 23
   Consulting, Arranging Contracts, Investing, and Meeting with Government Officials 26
   Return Home Permanently? 32

5. THE GLOBALIZATION OF ENTREPRENEURSHIP . . . 37
   Starting a Silicon Valley Company 38
   Transnational Entrepreneurs 43
      Greater China 44
      India 46
   Future Transnational Activities? 48

6. CONCLUSION 51
   Directions for Policy 54
   Directions for Future Research 55

Appendix
A. Survey Questionnaire 59
B. Source of Survey Sample 65
C. Demographic Profile of Survey Respondents 67
D. Technical Note for Analyzing Multiple-Answer Questions . . . 77
E. Results of Regression Analysis 79

About the Author 85

Other Related PPIC Publications 87

Figures

3.1. When Did You Settle in the United States? 12
3.2. How Did You Come to Work in the United States? 13
3.3a. Have You Been Involved in Founding or Running a Start-Up Company? 13
3.3b. Have You Been Involved in Founding or Running a Start-Up Company? 14
3.4a. How Often Do You Attend Meetings of Professional, Immigrant, or Alumni Associations? 15
3.4b. How Often Do You Attend Meetings of Professional, Immigrant, or Alumni Associations? 17
3.5a. Very Important Sources of Technology and Business Information 18
3.5b. Very Important Sources of Technology and Business Information 19
3.6. Percentage of Respondents Ranking Family Members and Friends as a Very Important Source of Technology and Business Information 20
3.7a. Do You Have Plans to Start Your Own Business on a Full-Time Basis? 20
3.7b. Do You Have Plans to Start Your Own Business on a Full-Time Basis? 21
4.1a. How Many of Your Friends or Colleagues Have Returned to Their Country of Birth to Work or Start a Company? 24
4.1b. How Many of Your Friends or Colleagues Have Returned to Their Country of Birth to Work or Start a Company? 25
4.2. How Often Have You Traveled to Your Country of Birth for Business Purposes, on Average, in the Past Three Years? 26

4.3. How Often Do You Exchange the Following Types of Information with Friends, Classmates, or Business Associates in Your Country of Birth? 27
4.4. Percentage of Respondents Reporting Regular Exchanges of Information with Friends, Classmates, or Business Associates in Their Country of Birth 27
4.5. Have You Ever Helped Businesses in Your Country of Birth by Serving as an Advisor or Arranging a Contract? 28
4.6. Percentage of Respondents Who Have Helped Arrange Contracts for Companies inTheir Country of Birth 29
4.7a. Percentage of Respondents Who Have Invested Their Own Money in Start-Ups or Venture Funds in Their Country of Birth 30
4.7b. Percentage of Respondents Who Have Invested Their Own Money in Start-Ups or Venture Funds in Their Country of Birth 30
4.8. How Often Do You Meet with Government Officials from Your Country of Birth? 31
4.9. Percentage of Respondents Who Meet with Government Officials from Their Country of Birth 32
4.10a. Would You Consider Returning to Live in Your Country of Birth in the Future? 33
4.10b. Would You Consider Returning to Live in Your Country of Birth in the Future? 34
4.10c. Would You Consider Returning to Live in Your Country of Birth in the Future? 34
4.11. Factors Ranked as Very Important in the Decision to Return to Live in Country of Birth 36
5.1. In What Year Was Your Company Incorporated? 38
5.2. Where Was Your Company Incorporated? 39
5.3. How Many of the Original Founders of the Company Are from Your Country of Birth? 39
5.4. Percentage of Companies with More Than 50 Percent of Its Full-Time Employees from Founder's Country of Birth 40
5.5. Sources of Initial Capital for Start-Up Companies 41

5.6. Sources of Subsequent Funding for Start-Up Companies 41
5.7. How Much Capital Has the Company Raised to Date? . . 42
5.8. What, If Any, Difficulties Have You Faced Raising Capital? 42
5.9. Have Any of the Following Networks Helped You Overcome These Difficulties in Raising Capital? 43
5.10. Percentage of Respondents Involved in Founding or Running a Start-Up Company, by Frequency of Business Travel to Country of Birth 44
5.11a. Location of Business Relationships, Greater China 45
5.11b. Location of Business Relationships, Greater China 45
5.12. Nature of Business Operations in Greater China 46
5.13. Select the Key Factors That Influenced Your Decision to Set Up Business Relationships in Your Country of Birth 47
5.14a. Location of Business Relationships, India 48
5.14b. Location of Business Relationships, India 49
5.15. Nature of Business Operations in India 50
6.1. Which Factors Would Figure Most Importantly in Your Decision to Start a Business in Your Country of Birth? . . 52
6.2. What Problem Areas Would Deter You from Starting a Business in Your Country of Birth? 53
C.1. Foreign-Born Respondents, by Place of Birth 67
C.2. Age of Respondents, by Country of Birth 68
C.3. Gender of Respondents, by Country of Birth 69
C.4. Percentage of Respondents with Scientific, Technical, or Engineering Degrees 70
C.5. What Is Your Highest Educational Degree? 70
C.6. Percentage of Respondents with Professional Degrees . . . 71
C.7. Where Did You Earn Your Highest Educational Degree? 72
C.8. Please Describe Your Current Job 72
C.9. What Industry Does Your Company Belong to? 73
C.10. How Many Employees Work at Your Company at All Locations? 74
C.11a. Immigration Status of Foreign-Born Professionals 75
C.11b. Immigration Status of Foreign-Born Professionals 75

Tables

D.1. Detailed Procedure in Excel 77
E.1. Results of Regression Analysis 79
E.2 Definition of Variables Used in Regression 83

Acknowledgments

Many people assisted with this survey at different times in its lengthy gestation. First, the survey could not have been completed without the generous assistance and participation of the leadership as well as the membership of the associations of Chinese and Indian immigrants from Silicon Valley listed in an appendix. I hope that the findings are useful to them. Several graduate students participated actively in the research design and subsequent development of the survey. Jumbi Edulbehram and Michelle Liao developed the original questionnaire in 1998 for a telephone or mail survey, but it proved too expensive to pursue at the time. Two years later, Guoqiang Yu convinced me to consider an Internet survey and revised the questionnaire to provide distinct versions for Mainland Chinese as well as for Taiwanese and Indian immigrants. Michelle Liao, Guoqiang Yu, and Xioahong Quan also worked closely with the leadership of the professional associations to orchestrate the successful deployment of the survey. Rafiq Dossani helped to edit the survey and worked with the Indian community to ensure a high response rate.

I am especially grateful to Jose Ver and David Hollevoet of CustomerSat.com whose generous advice and assistance during the development and set-up of the survey as well as the deployment and hosting process went well beyond the requirements of their contract. They were consistently professional and patient in dealing with scholars whose time frame and concerns differed substantially from those of their corporate clients. Mark Baldassare at PPIC provided invaluable advice on survey methods throughout the process, and Mike Teitz, Director of Research at PPIC, provided wisdom and moral support when they were most needed. The report was substantially improved by the detailed reviews provided by Mark Granovetter, James Rauch, Mark Baldassare, Michael Teitz, Junfu Zhang, and Tang Huihao. Although all of these people improved the final product, the author is solely responsible for any error of fact or interpretation.

1. Introduction and Overview of the Study

Entrepreneurship and globalization are central concerns of 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 primarily on the behavior of multinational corporations and nation-states.[2] As a result, entrepreneurship and globalization are rarely linked in either scholarship or policy.

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,[3] for example, Taiwan-born entrepreneurs have built social and professional networks to support U.S. ventures, which they use to accelerate the formation of new firms in

[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, CA: Stanford University Press, 1999, and P. Dicken, *Global Shift: Transforming the World Economy*, 3rd edition, New York: Guilford Press, 1998.

[3]The precise definition of Silicon Valley continues to evolve as the industrial base diversifies and expands geographically. For purposes of this report, it is defined as the San Francisco Bay Area.

Taiwan.[4] There is evidence of a similar process among Indian immigrant entrepreneurs,[5] and scholars have begun to document the emergence and economic significance of strikingly similar transnational activities among Latin-American immigrants in the United States.[6]

However, we know little about the extent and contours of this phenomenon. In what ways are globalization and immigrant entrepreneurship linked? Do foreign-born professionals participate in local networks as actively as their U.S.-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 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 highly skilled workers between highly developed and less-developed economies?[7]

Policymakers, in turn, face new challenges resulting from the increasingly open flows of skill, technology, and capital across national boundaries. These processes have already transformed debates about trade, immigration policy, and intellectual property rights, and they are forcing the creation of new institutions and mechanisms for adjudicating

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[4]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.

[5]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.

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

[7]For the emerging literature on these subjects, see James Rauch and Vitor Trinidade, "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.

conflicts.[8] This study will help to identify significant, and often unanticipated, areas of policy concern for the future.

This study contributes to our understanding of entrepreneurship, globalization, and their interrelations by documenting the 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.

The organization of the report is as follows. Chapter 2 documents the methodology used to prepare the survey instrument, identify the sample, and conduct the survey. It also discusses the potential sources of bias in the survey. Chapter 3 examines the involvement of Silicon Valley's foreign-born professionals in local associational life and their entrepreneurial experiences and intentions. The fourth chapter documents the extensive professional and business connections Silicon Valley's first-generation immigrants have built to their native countries. It relies on a range of indicators, including the frequency of business travel and long-distance information exchanges as well as the role of immigrants in arranging business contracts, advising companies, investing in start-ups, and meeting with government officials from the native country. Chapter 5 examines the subset of the survey's respondents who have started their own companies. Chapter 6 investigates the substantial "brain circulation" between Silicon Valley and regions in India and Greater China. The appendixes provide the text of the survey questionnaire, the source of the survey sample, a profile of survey respondents, and detailed results of the regression analysis.

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[8]Take, for example, the front page of *The Wall Street Journal* on August 30, 2001. One column describes the proliferation of "Mexican company towns" in the United States as millions of workers, often illegal, have moved across the border to fill growing labor shortages in traditional industries—creating tensions with older workers and residents and new challenges for mill owners and local policymakers. Another column describes an innovative policy proposal for "wage insurance" that would financially compensate "displaced workers" whose incomes have fallen as a result of imported competition.

2. Data Sources and Methodology

Surveying foreign-born professionals is unusually difficult. Most daunting is the challenge of developing a sampling frame because the target population (foreign-born engineers and other professionals) is difficult to identify and, once identified, difficult to reach. In addition, we have only rough estimates of the population of immigrant professionals in a region. This makes it difficult to determine the representativeness of the survey results accurately. Nevertheless, we have attempted to maximize the validity of our results given these inherent limitations.

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.[1] Unfortunately, the CPS sample is too small to reliably estimate the size of other groups of immigrant professionals working in the region's technology industries. More accurate counts of these populations will be available when the 5% Public Microdata Sample from the 2000 U.S. Census is released. The 1990 data are simply too old given the rapid changes in the immigrant population.

[1]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-county 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-literate professionals. Web-based surveys are still used primarily by corporations for market research but remain in their infancy for scholarly research. However, they offer significant advantages for surveying professionals, such as those studied here, who are comfortable with computers and more likely to respond to a survey on the web than to one conducted through the mail or over the telephone.[2] Also, the costs of large-scale web-based surveys are substantially lower than those for telephone or mail surveys; electronic distribution costs are minimal, and responses are entered directly into a database rather than hand-coded. This method also eliminates potential sources of error associated with the manual entry of survey data.

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. CustomerSat.com helped develop the survey and a process to increase its reliability and response rate. The company was also responsible for survey coding, set-up, deployment, and hosting. It provided off-line reporting and descriptive analysis of results using custom software tools as well.

We designed the survey questionnaire using insights gained from several years of interview-based research on immigrant entrepreneurship in Silicon Valley. The questions and categories used in the survey thus reflect the insights and experience of more than 140 in-depth, face-to-face interviews with first-generation immigrants in Silicon Valley.[3] In addition, a pretest was conducted with approximately 25 foreign-born professionals to identify any confusing or potentially misleading questions. The text of the survey questions is in Appendix A.

One advantage of web-based surveys is the ability to use software to design branching points for the different subgroups of the survey population. This survey included several branching points to collect more customized data for different categories of respondents (Chinese,

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[2]Business surveys normally have low response rates in any case. Don A. Dillman reports approximately 20 percent response rates for this population in *Mail and Internet Surveys: The Tailored Design Method*, New York: Wiley, 2000.

[3]For some of the results of this research, see A. Saxenian, *Silicon Valley's New Immigrant Entrepreneurs*, San Francisco, CA: Public Policy Institute of California, 1999.

Indians, other foreign-born, and U.S.-born) as well as for those who have started companies and who have business connections to their native countries.

The sample for the survey was drawn from the memberships of 17 leading immigrant professional associations in Silicon Valley (see the list in Appendix B). 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.[4]

The initial goal was for the associations to provide email addresses for all of their members to CustomerSat.com with the protection of a nondisclosure agreement and for CustomerSat.com to directly invite all the addressees (after eliminating duplicates) to participate in the survey. However, 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. On one hand, the 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

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[4]For more detailed information on the origins and roles of these associations in Silicon Valley, see Saxenian, 1999.

immigrant populations in Silicon Valley.[5] Furthermore, the association lists do not represent random samples of these populations but rather the most active members of the respective communities.

The survey was on-line for two months, between May 15 and July 13, 2001. CustomerSat.com sent out 10,837 invitations to participate in the survey and received 2,273 responses, a 21 percent response 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 (see Appendix B). The number of responses to any particular question also varied because some respondents did not answer every question or failed to complete the survey and because the survey's branching points narrowed the base for some questions considerably. We list the total number of respondents to each of the questions analyzed in this report.

The representation of foreign-born Chinese and Indian workers in the survey is difficult to calculate because of the 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 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

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[5]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.

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.[6]

The respondents to the survey can be categorized as follows: 12 percent were born in the United States and 88 percent are foreign-born. Of the foreign-born respondents, 43 percent were born in India, 30 percent in Mainland China, 12 percent in Taiwan, and the remaining 15 percent were born in other countries—including 11 percent from elsewhere in Asia. The following categories are used in the analysis: Greater China, India, other foreign-born, and U.S.-born. Respondents from Mainland China and Taiwan are treated separately because the sample sizes allow us to highlight their distinctive immigration histories and behavior. The demographics of survey respondents and their educational, employment, and immigration profiles are summarized in Appendix C.

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. These groups definitely merit further research, as the partial data we received suggest that each represents a distinctive pattern.

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.

Several questions in the survey allow for multiple responses (e.g., "Select up to three problem areas that would deter you from starting a

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[6]See Saxenian, 1999, for more details on these "new" immigrant entrepreneurs.

business in your home country"). The technical procedure for analyzing the responses to these questions is detailed in Appendix D.

Finally, we performed multivariate analysis to control for individual characteristics, such as age and education levels, when comparing group outcomes regarding such matters as entrepreneurship, associational attendance, and frequency of travel. Appendix E lists the results of ordinary least squares or binary logit regression models developed to test the key relationships observed in the survey data. These equations control for characteristics of the sample groups (such as age, gender, and education) and distinguish significant effects related to the respondent's nativity or country of origin. Because age and timing of arrival in the United States are highly correlated for the foreign-born respondents in our sample, we have used only age in this analysis. The results confirm the direction and strength of the relationships reported in the text at the 95 or 90 percent significance level.

3. Immigrant Networks and Entrepreneurship

This study focuses on 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. The 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. The findings suggest that 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 Indian respondents and only 28 percent of the Mainland Chinese (Figure 3.1).

The immigration trajectories of the survey respondents differ significantly. A great majority of the Chinese and other foreign-born survey 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-

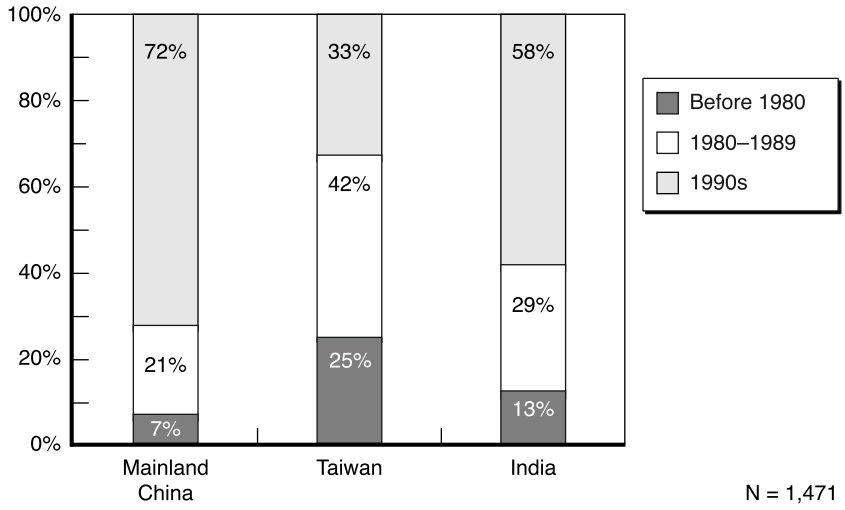

Figure 3.1—When Did You Settle in the United States?

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 3.2).

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 (Figure 3.3a). Sixty percent of Indian respondents report being 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 report experience working in start-ups, either part-time or full-time (Figure 3.3b). Our analysis shows that involvement in founding or running a start-up is strongly correlated

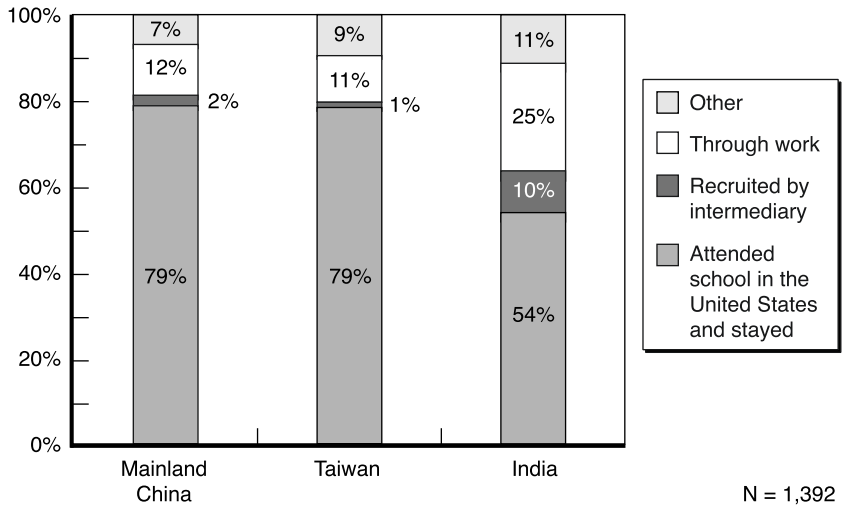

Figure 3.2—How Did You Come to Work in the United States?

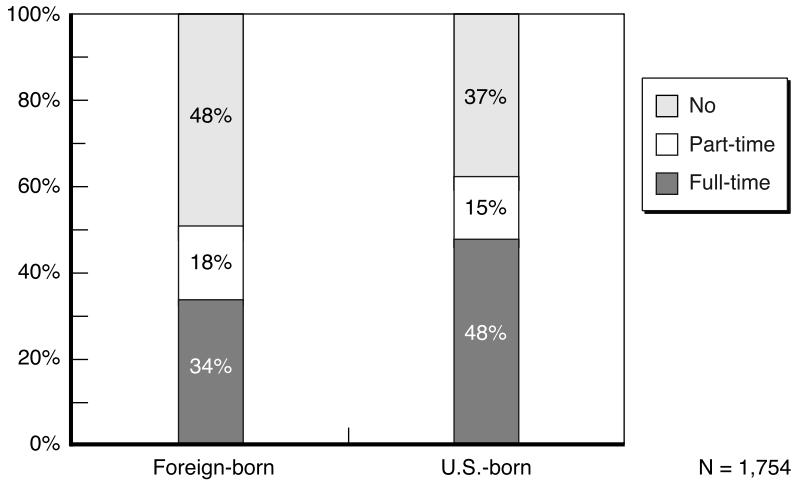

Figure 3.3a—Have You Been Involved in Founding or Running a Start-Up Company?

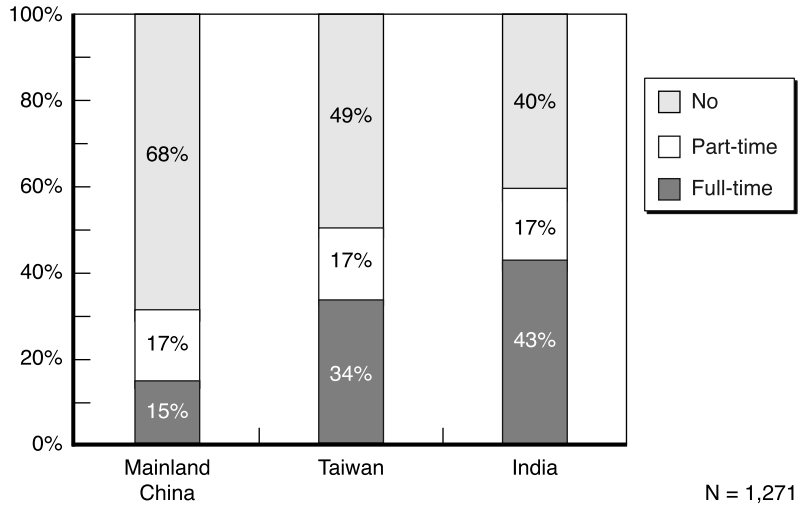

Figure 3.3b—Have You Been Involved in Founding or Running a Start-Up Company?

with age, gender (male), and business education. It also confirms, all other factors held constant, the lesser involvement of Mainland Chinese relative to that of those born in Taiwan, India, or the United States (see the columns labeled "FOUNDING" in Appendix Table E.1).

The 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: Those who join local professional associations may be more likely to become entrepreneurs, and participation in an association provides exposure to the role models and social networks that encourage and support entrepreneurship. All the associations surveyed for this report provide services and programs that foster entrepreneurship; some (like The Indus Entrepreneur—TiE) make it central to their mission whereas others do it to complement other professional and technical activities.

Associational Activities

Starting a company in today's high-technology business environment requires ongoing access to external sources of information. So it is perhaps no surprise that the professionals surveyed participate actively in local social and professional networks. Nineteen percent of the survey's foreign-born respondents report attending 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. Because our sample is drawn from association lists, and thus heavily biased toward those who participate often, the overall foreign-born professional population is probably less involved in such activities. Compared to their U.S.-born counterparts, the Chinese and Indian respondents report lower rates of association attendance. Respondents from Taiwan and Mainland China report more frequent attendance than those born in India. Regardless of these differences, the results suggest that the most active immigrants to Silicon Valley rapidly adopt the pattern of external networking and information exchange that distinguishes the region (Figure 3.4a).

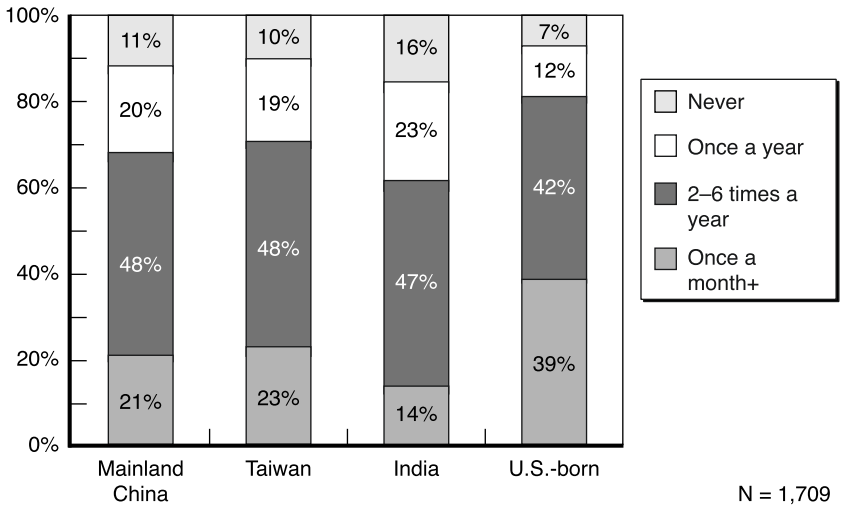

Figure 3.4a—How Often Do You Attend Meetings of Professional, Immigrant, or Alumni Associations?

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, with the most frequently cited being the Silicon Valley Chinese Engineers Association (23 percent), the Monte Jade Science and Technology Association (17 percent), the Chinese Information and Networking Association (15 percent), and the Asian American Manufacturers Association (14 percent). Indian associational activity, by contrast, is heavily concentrated; TiE was cited by 66 percent of all respondents born in India.

These differences are also reflected in the reported 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 officers 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 (Figure 3.4b). An ordinary least square regression confirms that age is a significant predictor of association attendance and that, holding age and all other variables constant, U.S.-born respondents are more likely than foreign-born respondents to attend association meetings. That analysis also indicates that among foreign-born respondents, Indians attend association meetings the least frequently (see the columns labeled "MEETING" in Appendix Table E.1).

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.-

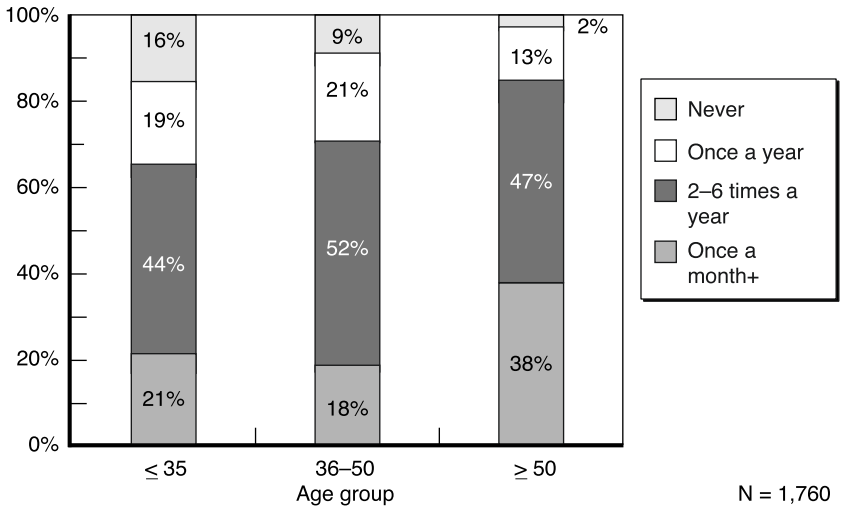

Figure 3.4b—How Often Do You Attend Meetings of Professional, Immigrant, or Alumni Associations?

born and 67 percent of foreign-born respondents ranked "business associates" as a very important source of information.[1] This finding appears to confirm the importance of informal networking in the region—particularly its high ranking as a source of information for U.S.-born respondents. The rankings of other sources of information are similar for both 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." Very few foreign-born or U.S.-born respondents found "media targeted toward immigrants" as an important source of information (Figure 3.5a).

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. This difference could well be due to the language difficulties that

[1]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.

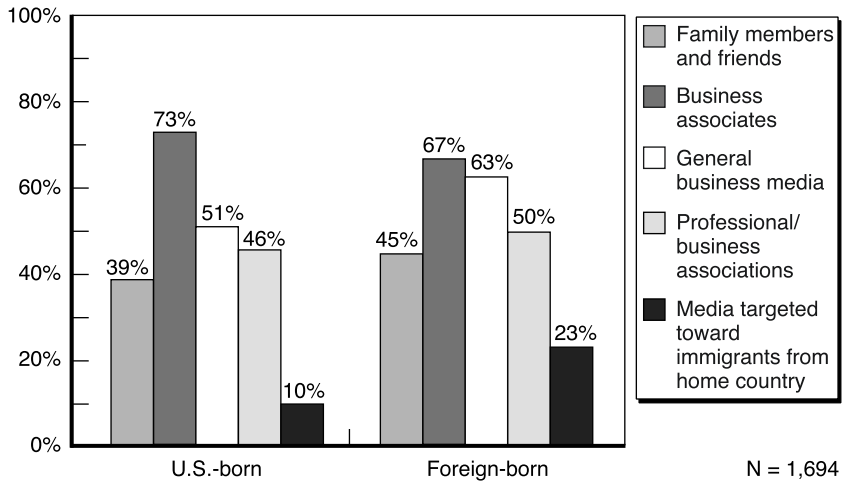

Figure 3.5a—Very Important Sources of Technology and Business Information

recent Chinese arrivals face in the United States. However, business associates are the top-rated source of information for Chinese as well, even though the absolute rankings differ (Figure 3.5b). 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.

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." Once again, this finding should be taken in the context of a sample that is biased toward active association members and unlikely to represent the population as a whole accurately.

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 friends 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

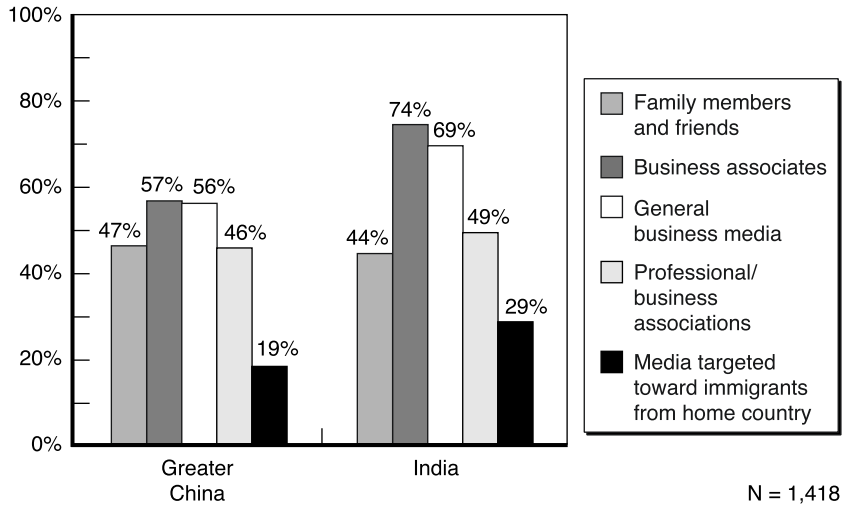

Figure 3.5b—Very Important Sources of Technology and Business Information

literature, which stresses the relative importance of family in Chinese business and social life. However, it is worth noting that only 37 percent of Taiwan-born respondents rank family and friends as "very important," slightly lower than reported by the U.S.-born population (Figure 3.6).

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 born 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 (Figures 3.7a and 3.7b).

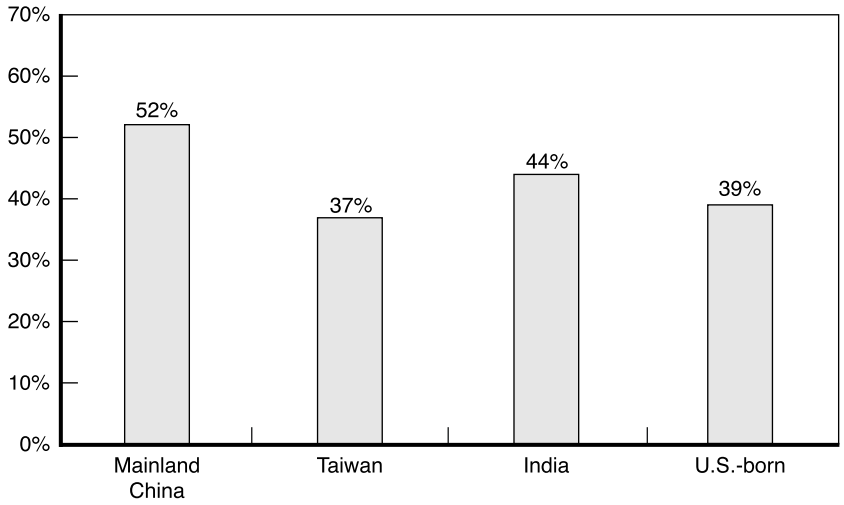

Figure 3.6—Percentage of Respondents Ranking Family Members and Friends as a Very Important Source of Technology and Business Information

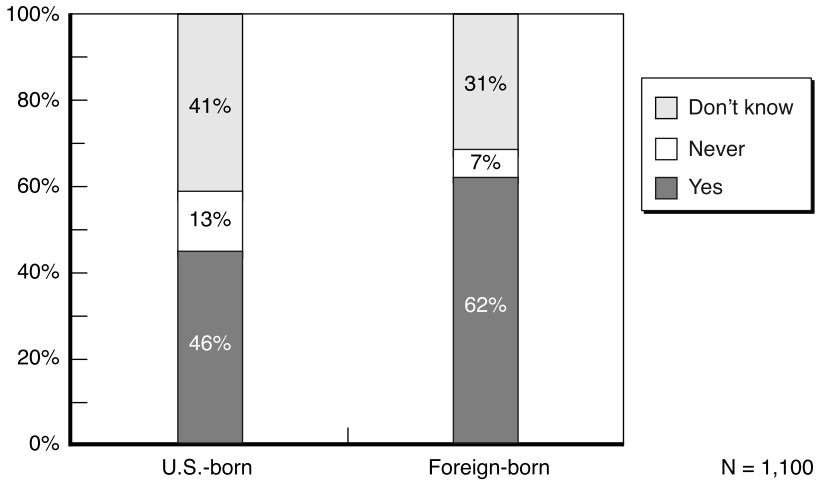

Figure 3.7a—Do You Have Plans to Start Your Own Business on a Full-Time Basis?

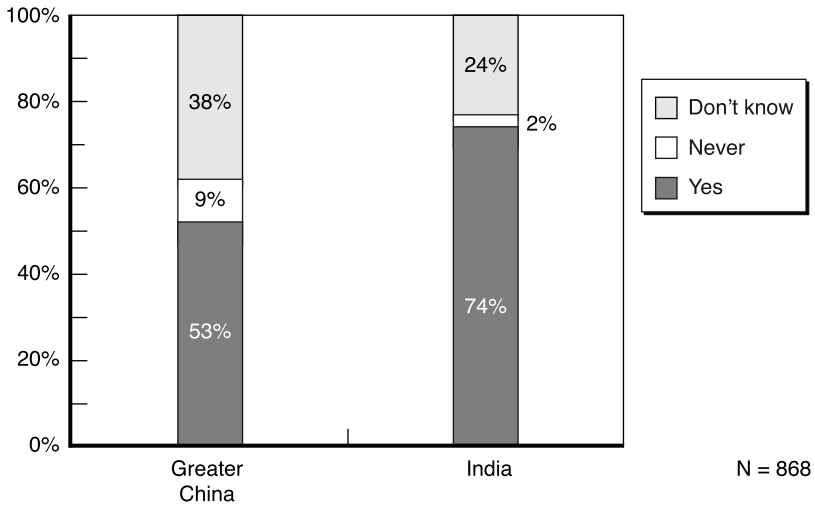

Figure 3.7b—Do You Have Plans to Start Your Own Business on a Full-Time Basis?

Not only are these immigrants entrepreneurial but they also appear to be interested in becoming transnational 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 of Indian respondents would consider locating their businesses in their native countries. Although these stated intentions have little predictive power, they indicate the extent to which Silicon Valley's immigrants continue to feel ties to their native countries. The next chapter explores the nature of these ties in greater detail.

4. 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 the 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.

Returnees, 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 (Figure 4.1a). Forty-five percent of the other foreign-born respondents know of no such returnees. This finding suggests that 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 populations in Silicon Valley.

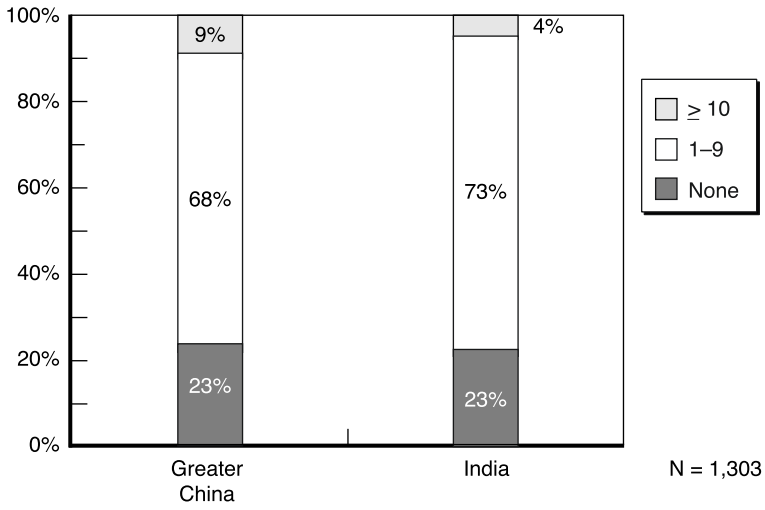

Figure 4.1a—How Many of Your Friends or Colleagues Have Returned to Their Country of Birth to Work or Start a Company?

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, 26 percent of Mainland Chinese surveyed know no returnees and only 6 percent know ten or more (Figure 4.1b). 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.

Ordinary least squares regression confirms that, controlling for all other variables, Chinese and Indians are more likely than other foreign-born professionals to know people who have returned to their native countries to work or start a company. Likewise, it confirms that Taiwanese nativity is a stronger predictor of knowing returnees than is Mainland Chinese or Indian nativity, although both of those have positive coefficients as well. Education level is also positively related to knowing returnees (see the columns labeled "RETKNOW" in Appendix Table E.1).

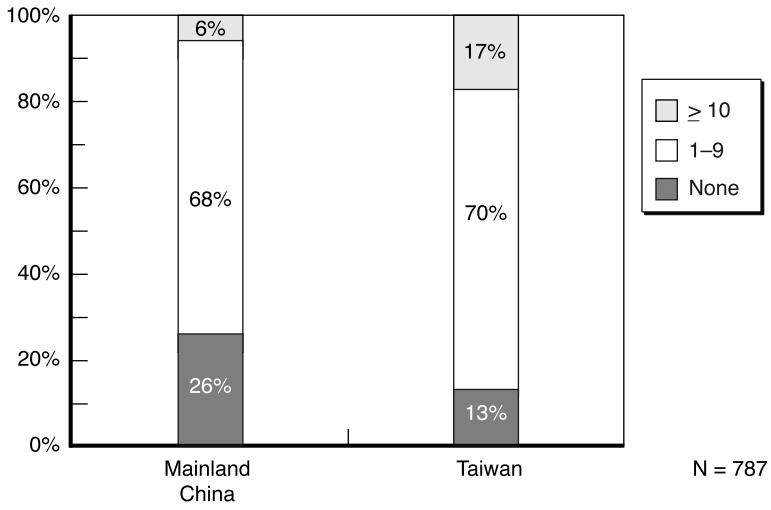

Figure 4.1b—How Many of Your Friends or Colleagues Have Returned to Their Country of Birth to Work or Start a Company?

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 of them report returning home for business two to four times a year compared to 9 percent of Indians and 8 percent of Mainland Chinese (Figure 4.2). Regression analysis confirms these relationships as well as a strong correlation between age and travel (see the columns labeled "TRAVEL" in Appendix Table E.1).

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

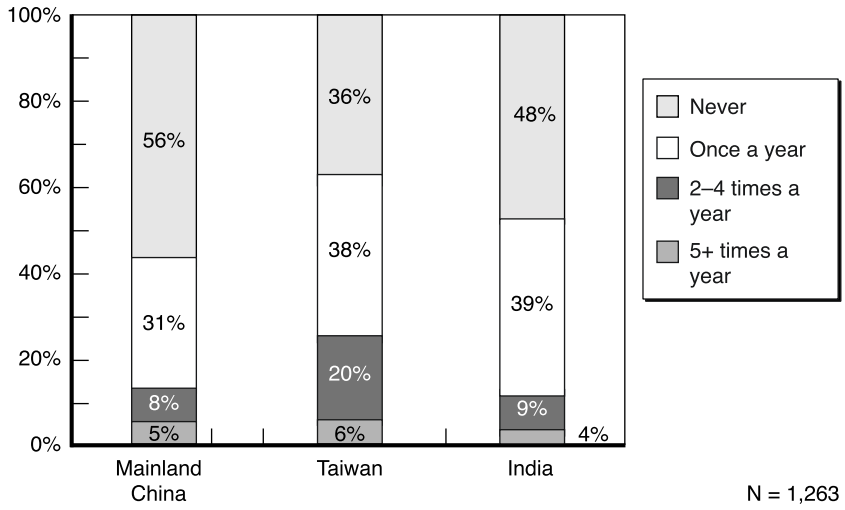

Figure 4.2—How Often Have You Traveled to Your Country of Birth for Business Purposes, on Average, in the Past Three Years?

percent share information about jobs or business opportunities in their native country (14 percent regularly)[1] (Figure 4.3).

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 (Figure 4.4). Chinese and Indians exchange information about jobs and business opportunities in their native countries the least frequently; 30 percent never exchange such information.

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

Silicon Valley immigrants' connections to their countries of birth go beyond travel and information exchange. Twenty-seven percent of all foreign-born respondents report serving as an advisor or consultant

[1]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.

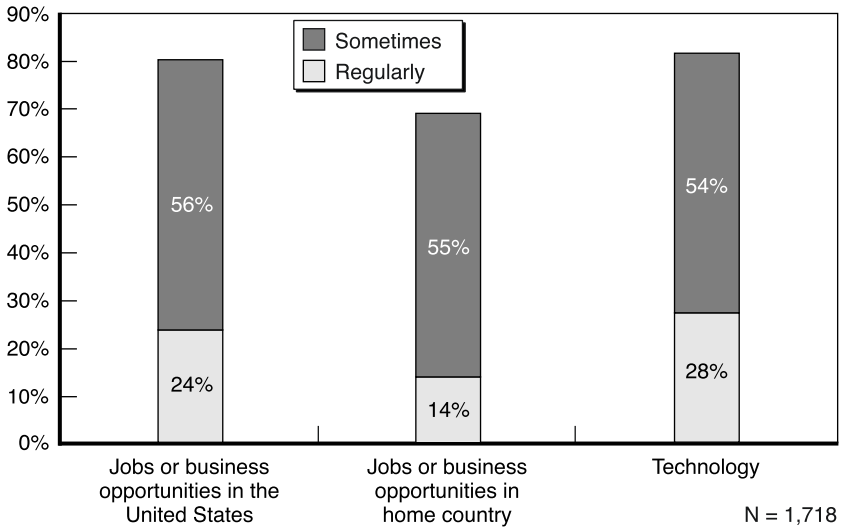

Figure 4.3—How Often Do You Exchange the Following Types of Information with Friends, Classmates, or Business Associates in Your Country of Birth?

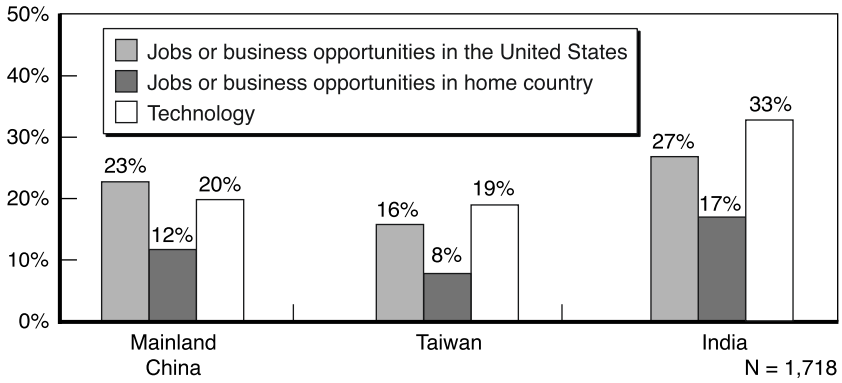

Figure 4.4—Percentage of Respondents Reporting Regular Exchanges of Information with Friends, Classmates, or Business Associates in Their Country of Birth

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 (Figure 4.5). Legal and business training are important predictors of service as an advisor, but once education is controlled for, the differences noted above between Indians and Chinese are statistically significant (see the columns labeled "ADVISOR" in Appendix Table E.1).

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 34 percent of Mainland Chinese. The nature of the sample means that 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 economies 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 4.6). For statistical confirmation of this relationship, see the columns labeled "CONTRACT" in Appendix Table E.1.

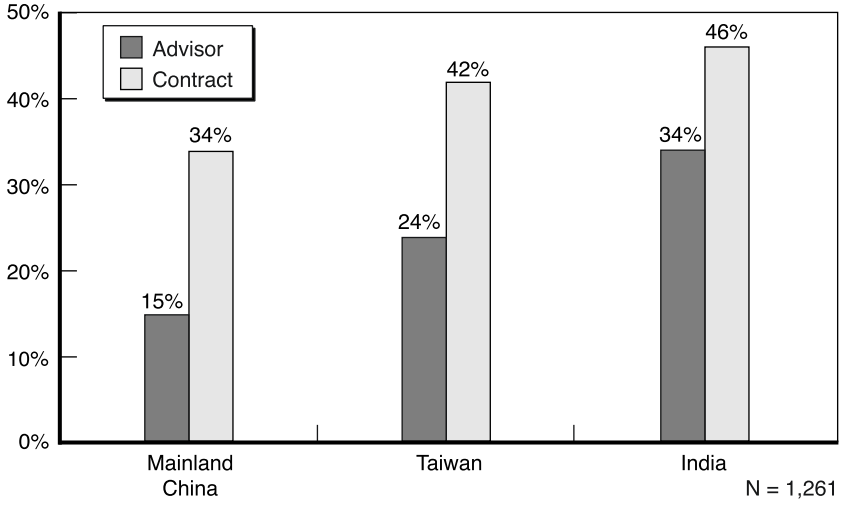

Figure 4.5—Have You Ever Helped Businesses in Your Country of Birth by Serving as an Advisor or Arranging a Contract?

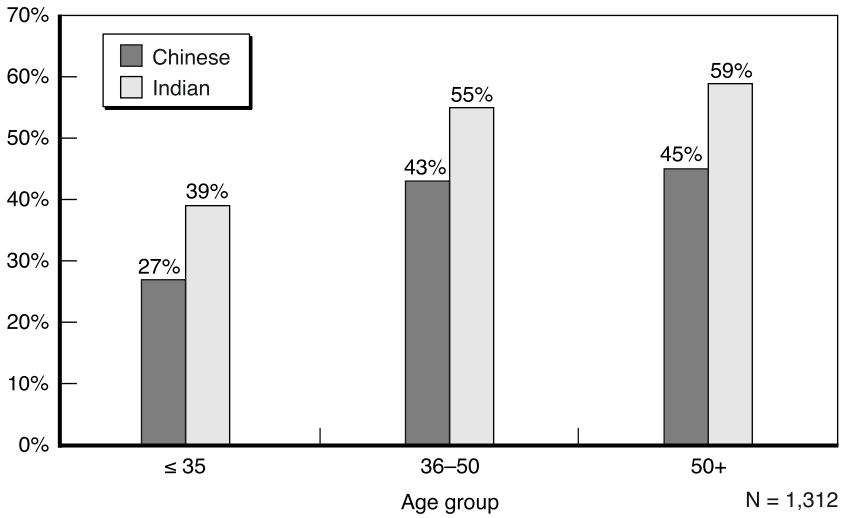

Figure 4.6—Percentage of Respondents Who Have Helped Arrange Contracts for Companies in Their Country of Birth

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) (Figure 4.7a).

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 (Figure 4.7b). For statistical confirmation, see the columns labeled "INVESTMENT" in Appendix Table E.1.

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

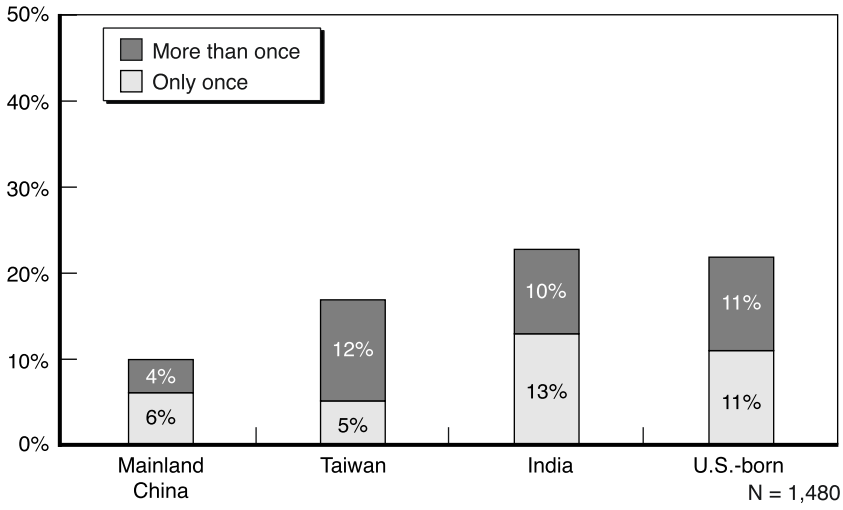

Figure 4.7a—Percentage of Respondents Who Have Invested Their Own Money in Start-Ups or Venture Funds in Their Country of Birth

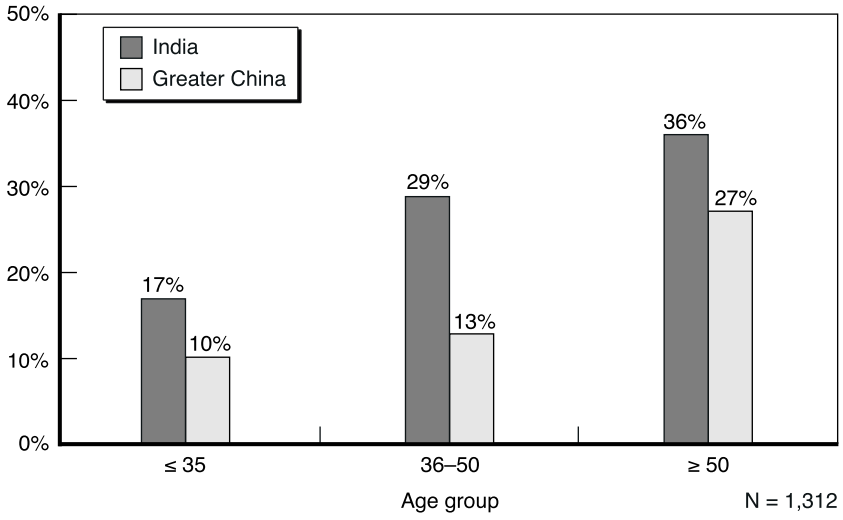

Figure 4.7b—Percentage of Respondents Who Have Invested Their Own Money in Start-Ups or Venture Funds in Their Country of Birth

regularly with government officials compared to 26 percent of Taiwanese and 27 percent of Indian immigrants (Figure 4.8).

Although the survey did not ask specifically about the substance of these meetings, our 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 (Figure 4.9). For statistical confirmation that age is a significant determinant of the tendency to meet with government officials, as well as that Mainland-born professionals are more likely to meet with government officials than are their counterparts born in Taiwan and India, see the columns labeled "GOVERNMENT" in Appendix Table E.1.

The data presented so far suggest that 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

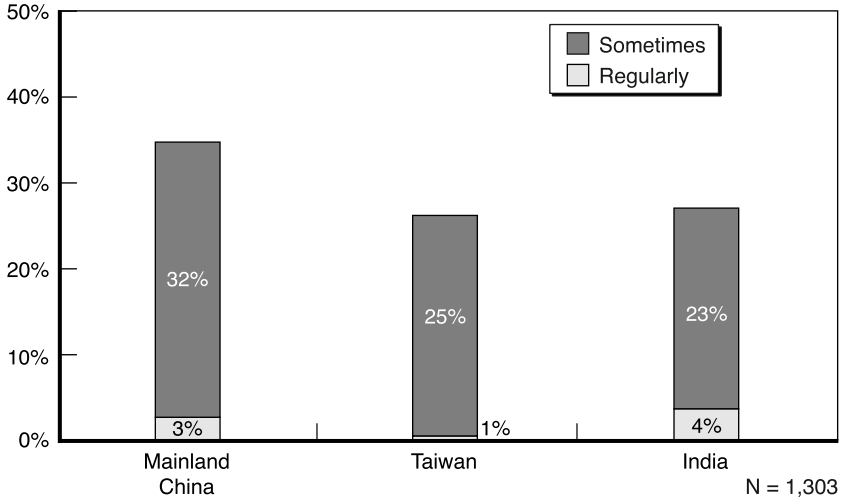

Figure 4.8—How Often Do You Meet with Government Officials from Your Country of Birth?

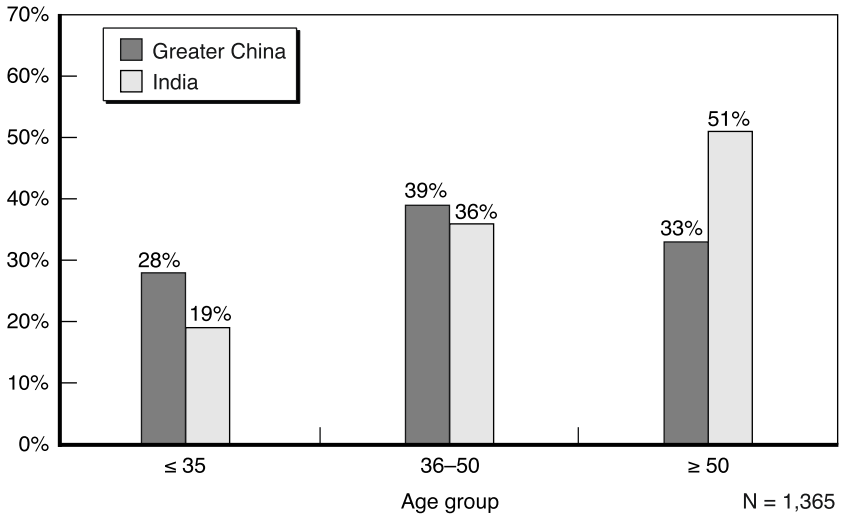

Figure 4.9—Percentage of Respondents Who Meet with Government Officials from Their Country of Birth

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.

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 (Figure 4.10a).

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. This result is not surprising: The older an immigrant, the more difficult it is

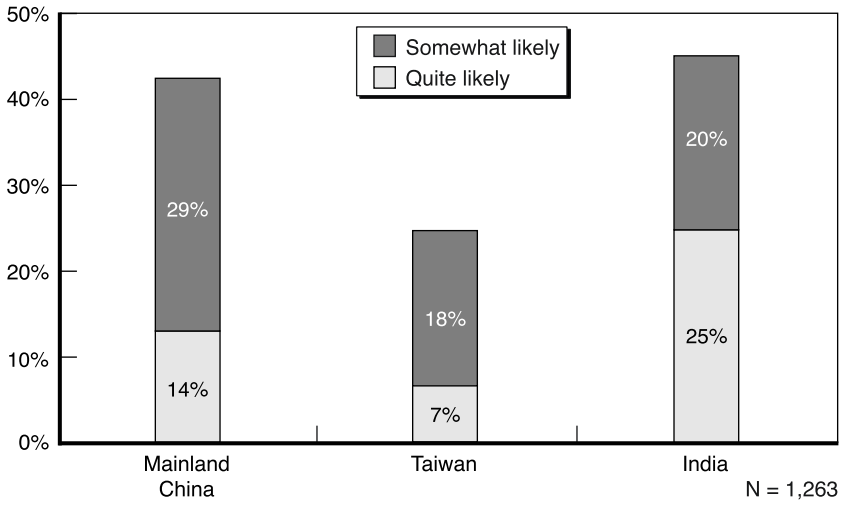

Figure 4.10a—Would You Consider Returning to Live in Your Country of Birth in the Future?

to return to his or her country of birth to live because of the accumulation of family and other commitments in the United States (Figure 4.10b). The negative relationship between age and willingness to return to the home country is statistically significant at the 95 percent level. Controlling for age and other individual characteristics also reveals that those from Greater China and India are more likely to consider returning home in the future than are those from Taiwan or other foreign locations (see the columns labeled "RETNFUT" in Appendix Table E.1).

Nor are these results significantly altered by immigration status. Whereas U.S. citizens are less 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 (Figure 4.10c). 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.

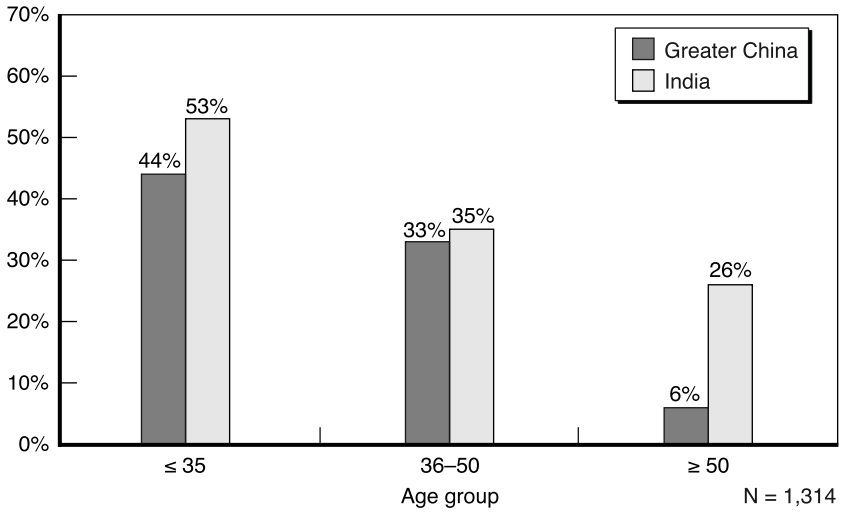

Figure 4.10b—Would You Consider Returning to Live in Your Country of Birth in the Future?

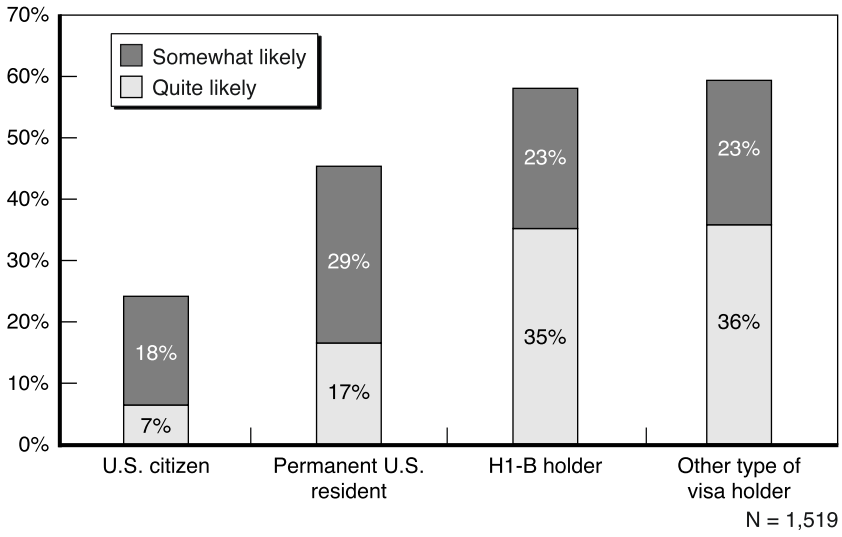

Figure 4.10c—Would You Consider Returning to Live in Your Country of Birth in the Future?

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.[2] 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 (Figure 4.11).

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.

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[2]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.

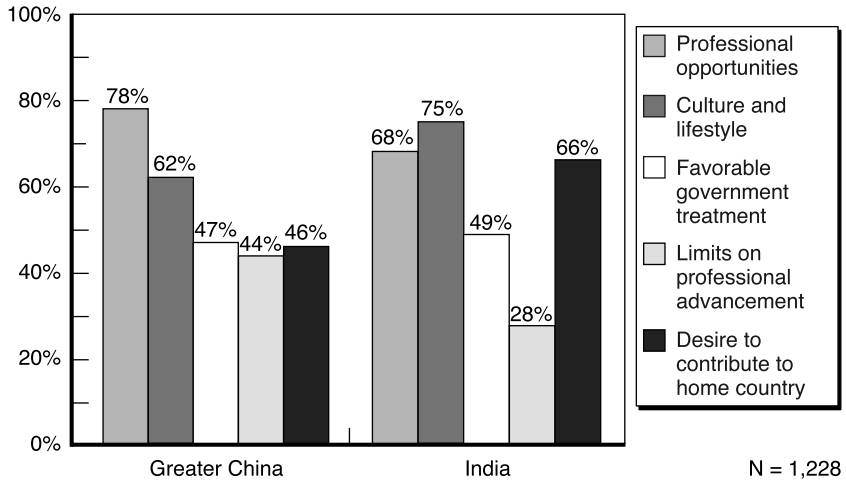


Figure 4.11—Factors Ranked as Very Important in the Decision to Return to Live in Country of Birth

5. 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 chapter focuses on the one-quarter of the survey respondents who are running start-up companies, 83 percent of whom are foreign-born. It appears that 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 most of the 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 exploiting their linguistic and cultural advantages, they are ideally positioned to draw on the distinctive skill 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 (Figure 5.1). The great majority (91 percent) of companies founded by foreign-born immigrants have been incorporated in the United States (Figure 5.2).

And whereas 40 to 50 percent of these entrepreneurs report starting businesses with two to 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 (Figure 5.3).

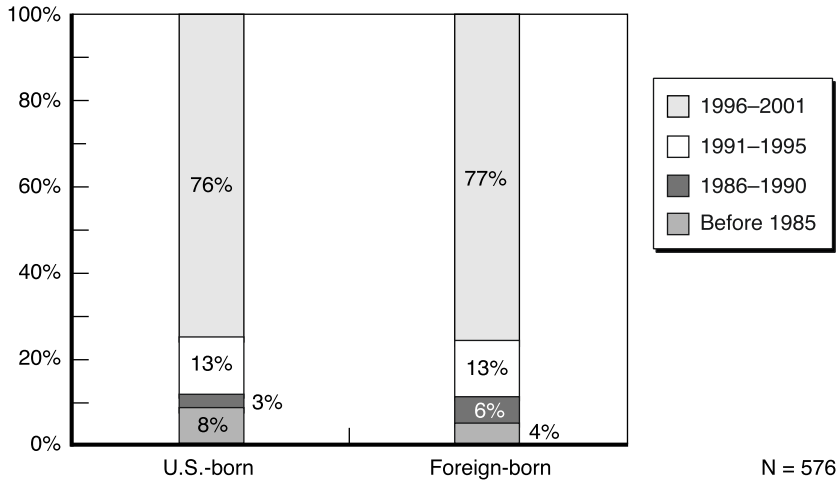


Figure 5.1—In What Year Was Your Company Incorporated?

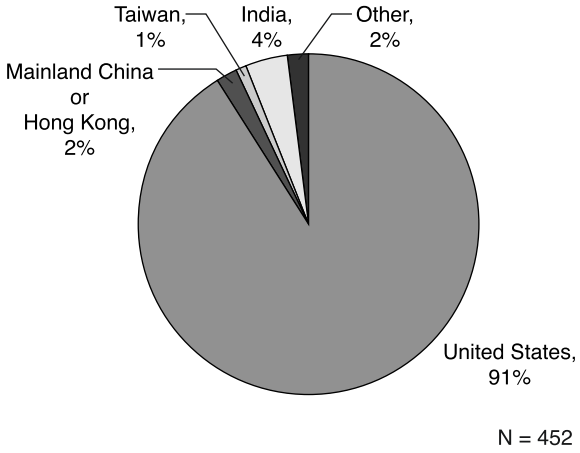


Figure 5.2—Where Was Your Company Incorporated?

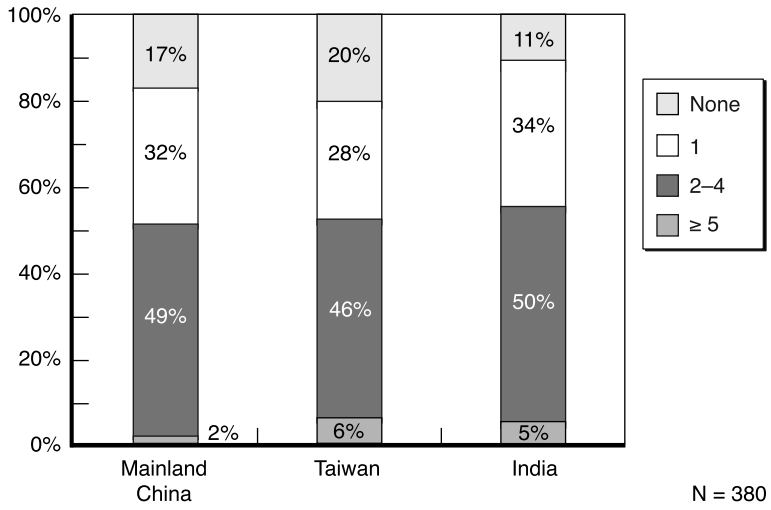


Figure 5.3—How Many of the Original Founders of the Company Are from Your Country of Birth?

Although immigrants may rely heavily on friends and colleagues from their native countries to start companies—this seems to be especially true of the Indian community—this ethnic dominance decreases steadily as companies grow (Figure 5.4).

The financing of start-ups for immigrants appears quite similar to that for U.S.-born entrepreneurs. Both groups rely heavily on personal savings and angel investors for their initial funding and primarily on venture capital for subsequent rounds of funding (Figures 5.5 and 5.6).

There is also little difference in the amounts of money raised. If anything, it appears that foreign-born entrepreneurs have been more successful fund-raisers, although the differences between groups are quite small (Figure 5.7).

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 5.8).

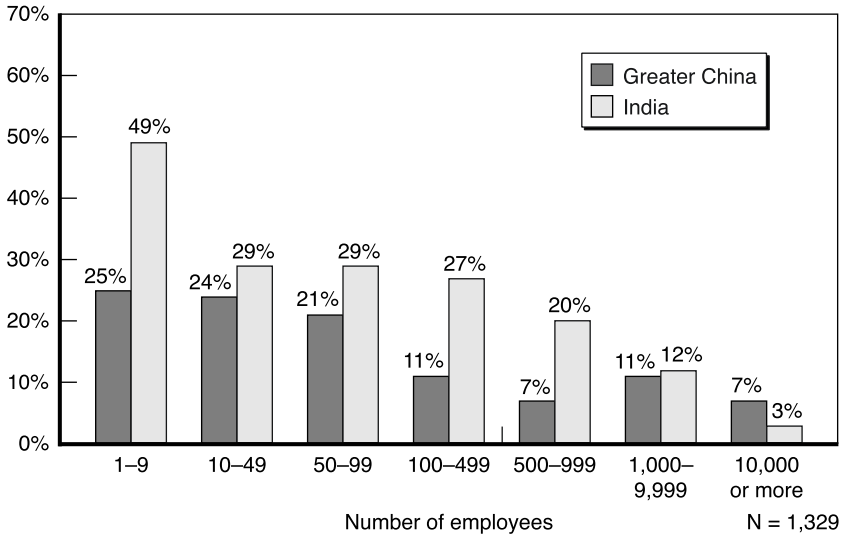
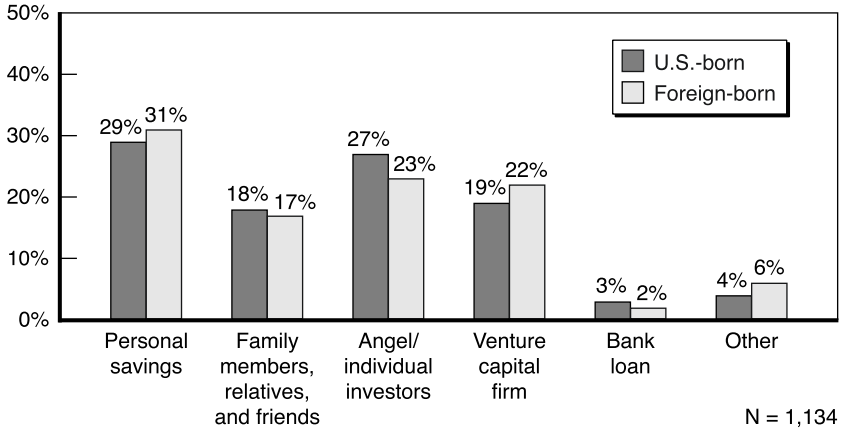
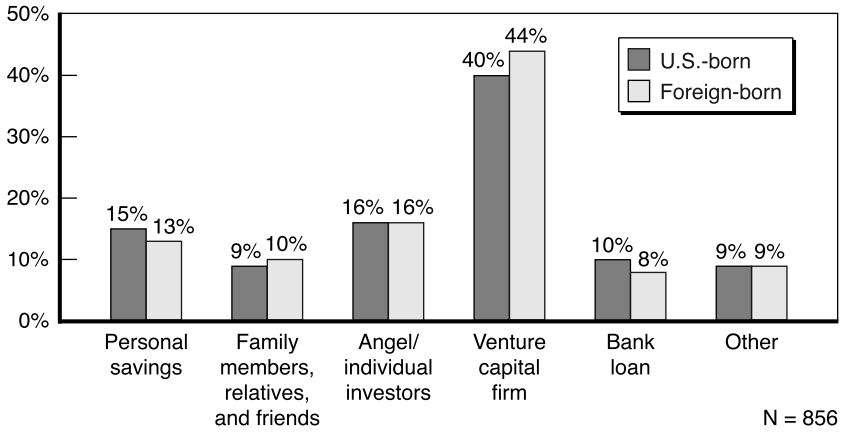


Figure 5.4—Percentage of Companies with More Than 50 Percent of Its Full-Time Employees from Founder's Country of Birth



NOTE: "Other" includes corporate and government funding.

Figure 5.5—Sources of Initial Capital for Start-Up Companies



NOTE: Other includes corporate and government funding as well as funds raised through an Initial Public Offering (IPO).

Figure 5.6—Sources of Subsequent Funding for Start-Up Companies

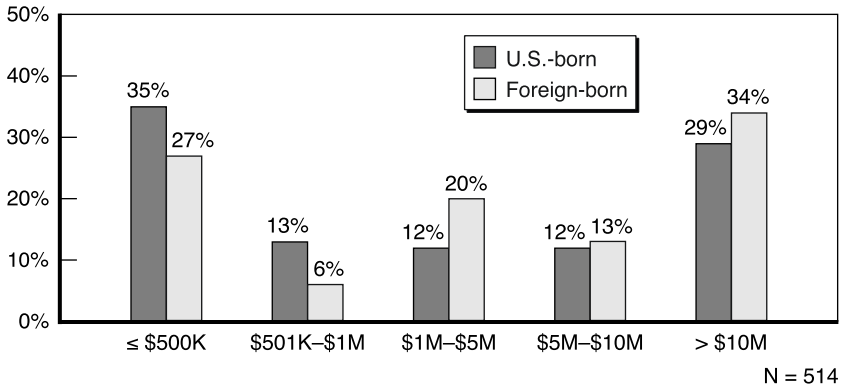


Figure 5.7—How Much Capital Has the Company Raised to Date?

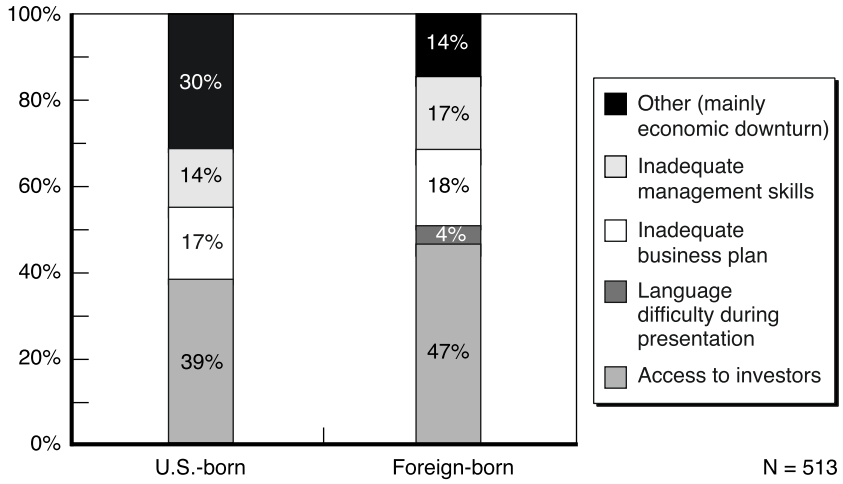


Figure 5.8—What, If Any, Difficulties Have You Faced Raising Capital?

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 (Figure 5.9).

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.

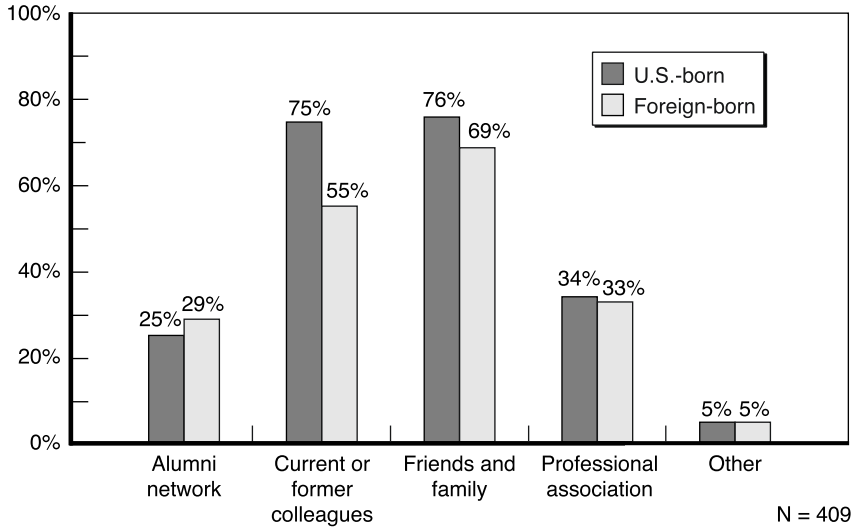


Figure 5.9—Have Any of the Following Networks Helped You Overcome These Difficulties in Raising Capital?

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. The great majority (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 the 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 of Indians who have been involved in start-ups travel to their native country for business five or more times per year (Figure 5.10).

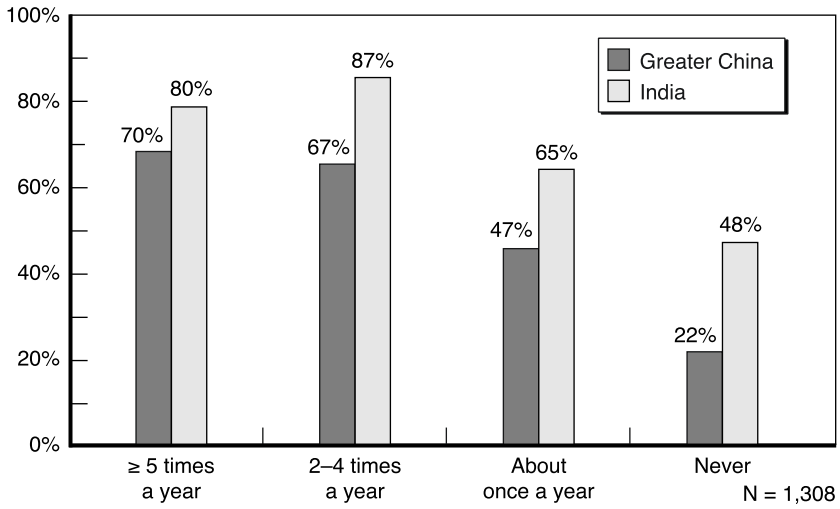
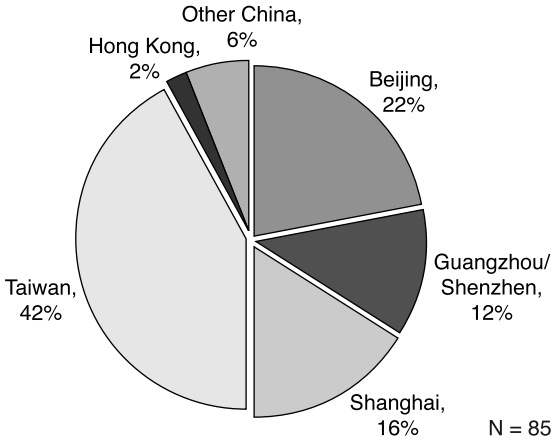


Figure 5.10—Percentage of Respondents Involved in Founding or Running a Start-Up Company, by Frequency of Business Travel to Country of Birth

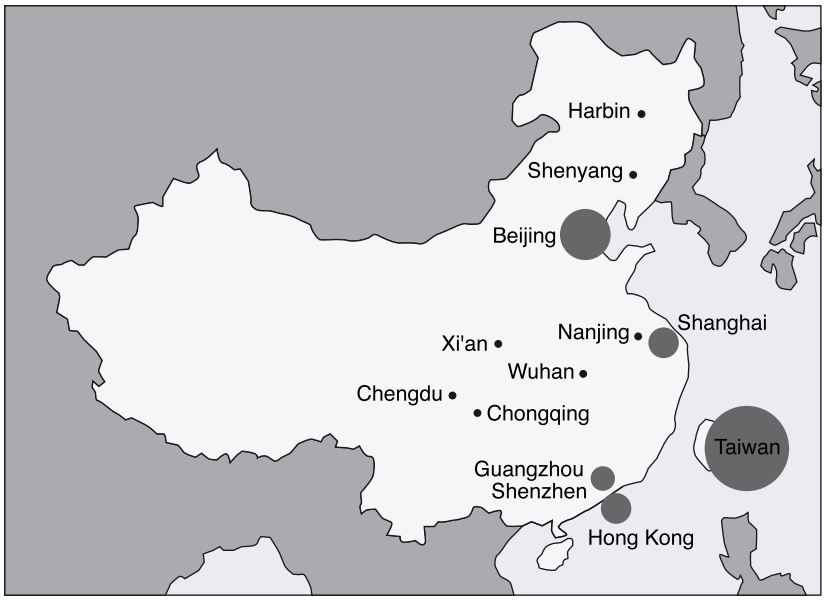
Greater China

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 economies 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/Shenzhen (12 percent) (Figures 5.11a and 5.11b).

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



Figures 5.11a—Location of Business Relationships, Greater China



NOTE: The size of bubbles corresponds to the proportion of business relationships established by Silicon Valley-based immigrant entrepreneurs in the region.

Figures 5.11b—Location of Business Relationships, Greater China

(19 percent), and software services (16 percent). It also includes smaller amounts of software or content development (14 percent) and research and development (10 percent) (Figure 5.12).

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) (Figure 5.13).

The survey asked respondents to list the three main problems that their businesses 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.

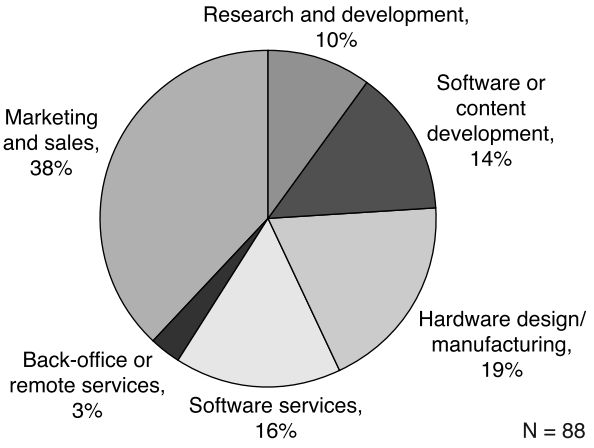


Figure 5.12—Nature of Business Operations in Greater China

India

Indian entrepreneurs from Silicon Valley have concentrated their business relationships in five major urban areas in the south of India:

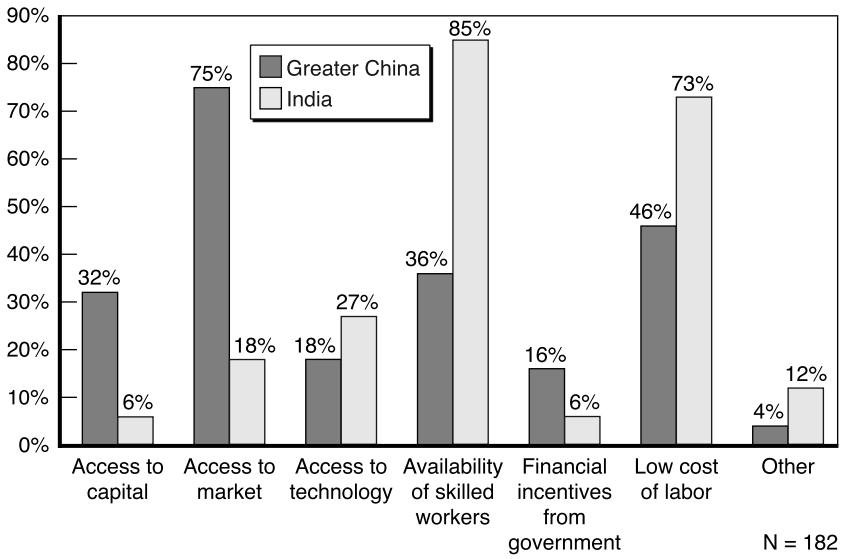


Figure 5.13—Select the Key Factors That Influenced Your Decision to Set Up Business Relationships in Your Country of Birth

Bangalore (28 percent), Bombay (17 percent), Chennai (13 percent), Hyderabad (13 percent), and Pune (9 percent) (Figures 5.14a and 5.14b).

Most of these 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) (Figure 5.15).

The main factors influencing the decision to establish business relationships in India were overwhelmingly the 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 (Figure 5.13).

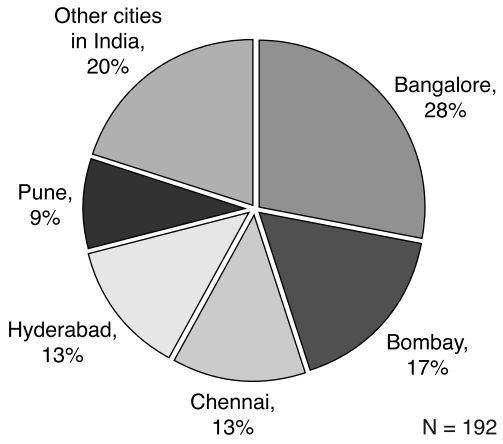


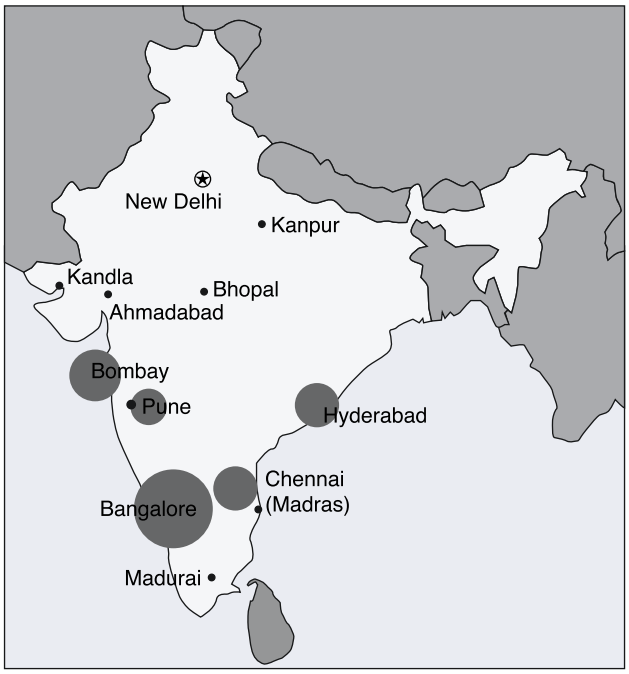
Figure 5.14a—Location of Business Relationships, India

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). This pattern suggests that the 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



NOTE: The size of the bubbles corresponds to the proportion of business relationships established by Silicon Valley-based immigrant entrepreneurs in the region.

Figure 5.14b—Location of Business Relationships, India

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).

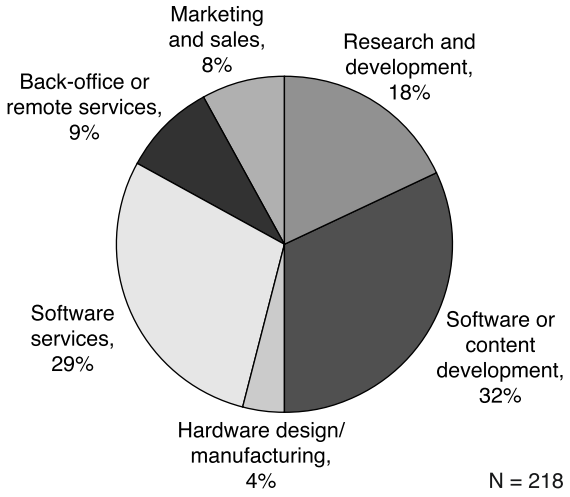


Figure 5.15—Nature of Business Operations in India

6. Conclusion

There is extensive evidence of brain circulation, or two-way flows of highly skilled professionals, between California and fast-growing regions in India and Greater China. Although there is little evidence of a reversal of the brain drain, as Taiwan experienced a decade ago, Silicon Valley's highly skilled Chinese and Indian immigrants have established a wide variety of transnational connections to their native countries. The most active of these first-generation immigrants frequently exchange information about technology, jobs, and business opportunities with friends and colleagues at home. Many invest their own money in start-ups and venture funds, help arrange business contracts, and advise companies or government officials in their countries. And a core group of transnational entrepreneurs have established business operations in emerging technology regions—especially Bangalore, Bombay, Taiwan, Beijing, and Shanghai—and travel between these regions and Silicon Valley frequently.

These transnational activities are likely to expand in the future. One of the most striking possibilities raised by the survey is 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—report that they would consider starting a business in their country of birth in the future. This does not mean that they will do so, of course, but most identify important advantages to starting a business outside the United States.

Most foreign-born respondents (65 percent) cite the 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) (Figure 6.1). 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 search for skilled labor than by the search for 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

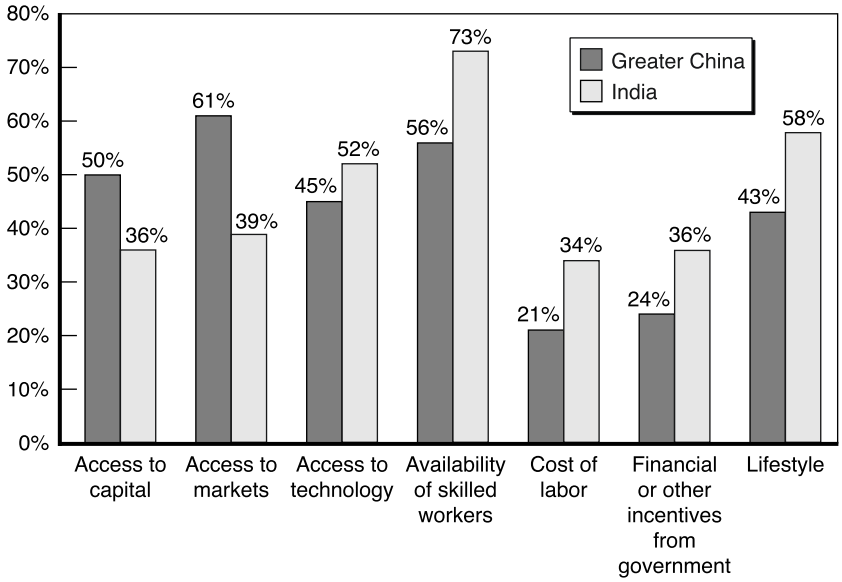


Figure 6.1—Which Factors Would Figure Most Importantly in Your Decision to Start a Business in Your Country of Birth?

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 6.2).

These data suggest that 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

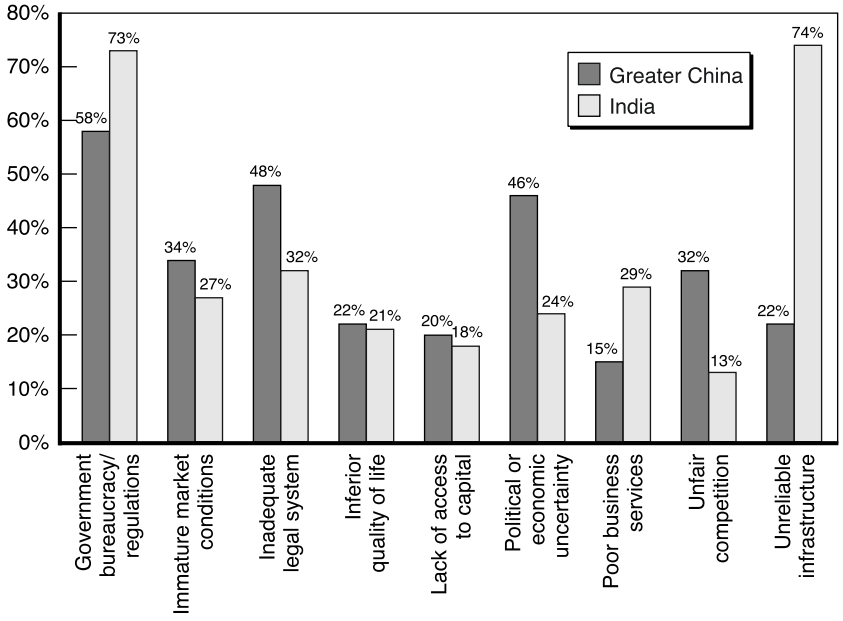


Figure 6.2—What Problem Areas Would Deter You from Starting a Business in Your Country of Birth?

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.

Directions for Policy

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 businesses. 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 suggests 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.

Directions for Future Research

The results of this survey suggest that transnational entrepreneurs and their communities are becoming important vehicles for the transfer of organizational as well as technical know-how between California and distant regional economies. However, the literature on technology transfer focuses almost exclusively on either the market or multinational corporations as mechanisms for transferring knowledge. We know little

about the organization and internal dynamics of these networks of immigrant entrepreneurs, venture capitalists, managers, and other professionals and service providers (such as lawyers, bankers, and consultants). It is also important to understand how transnational entrepreneurs and their communities relate to established corporations and other economic actors and the extent of their contributions to the transfer of technology, knowledge, capital, and other resources across national boundaries.

Future research should consider the effects of brain circulation on both sending and receiving economies. In particular, how do transnational entrepreneurs and their communities interact with existing domestic actors and institutions both in the United States and in developing countries? To what extent are hybrid models of production emerging in China and India as the Silicon Valley business model is integrated into and adapted to different economic contexts? And how do returning engineers and entrepreneurs integrate into and transform the local social and political structures in these countries?

And perhaps most important for California and the United States, what are the consequences of increased brain circulation and the globalization of entrepreneurship for economies such as that in Silicon Valley and for broader national political and security considerations? We need to understand and evaluate such positive factors as the expanded access to distant markets, sources of skill and capital, and growth in distant regions against the potential dangers posed by outflows of technology and know-how to this country's workforce, economy, and national security. These and related issues will likely become the subject of intense political debate in coming decades.

The role of second-generation immigrants in the emerging global networks is a subject that merits additional research. It is interesting to note, for example, that U.S.-born Chinese respondents are concentrated in a few associations, including AAMA, CITA, and Monte Jade, and minimally represented in others. And although our sample is not large enough to make reliable generalizations, the data suggest several hypotheses. It appears, for example, that second-generation Indian and Chinese professionals in Silicon Valley are as involved in business travel and investments in their countries of origin as are the most active of their

first-generation counterparts; but they are less likely to start companies with co-ethnics or to consider locating a business abroad.

The survey also leaves unanswered important questions about the other foreign-born groups in Silicon Valley. How do the experiences of the highly skilled Korean, Japanese, Vietnamese, and European immigrants compare to those of the Indians and Chinese? What are their immigration trajectories? To what extent are they building local networks and transnational connections to their native countries? The answers to these and related questions will provide scholars and policymakers with a clearer picture of changing local and global labor markets and professional networks.

Appendix A

Survey Questionnaire

Respondent Profile

Please specify your age.
Please specify your gender.
Were you born in the United States?
Where were you born?
What is your ethnicity?
When did you settle in the United States? Select one: before 1980, 1980–1989, 1990–1999, after 2000.
What best describes your current status in the United States? Choose one: U.S. citizen, permanent resident (green card holder), foreigner with H1-B visa, foreigner with other visa, other, please specify.
How did you come to work in the United States?
Where did you obtain your highest educational degree?
Please describe your current job.
Where is your company based?
What industry does your company belong to?
How many employees work in your company at all locations?

Local Networking

How often do you attend meetings of professional, immigrant, or alumni associations?
Please select all of the associations whose meetings you have attended in the past 2 years. (Association list provided based on country of birth and ethnic background.)
Have you ever served as an officer or a board member for the organizations listed above?
How important is each of the following sources in providing technology and business information? Rank each: family members and friends,

business associates, general business media, media targeted toward immigrants, professional or business associations.

Contacts with Country of Birth

How often have you traveled to *COUNTRY* for business purposes on average during the past three years?

How often do you exchange the following information with friends, classmates, or business associates in *COUNTRY*? Rank each: jobs or business opportunities in the United States, jobs or business opportunities in *COUNTRY*, technology.

Have you ever helped others arrange business contracts in *COUNTRY*?

Have you served as advisor or consultant for companies in *COUNTRY*?

How often do you meet with government officials from *COUNTRY*?

Would you consider returning to live in *COUNTRY* in the future?

Please rate the importance of each factor that might influence your decision to return to work in *COUNTRY*? Rank each: professional opportunities in *COUNTRY*, culture and lifestyle in *COUNTRY*, favorable government treatment of returnees in *COUNTRY*, limits on professional advancement in the United States, desire to contribute to the economic development of *COUNTRY*.

How many of your friends and/or colleagues have returned to *COUNTRY* to work or start a company?

Have you invested your own money in start-ups or venture funds in *COUNTRY*?

Current or Future Involvement in Start-Ups

Have you been involved in founding or running a start-up company?

Do you have plans to start your own business on a full-time basis?

Would you consider locating your business in *COUNTRY*?

If yes, please state your preferred location for the business. (Locations specified based on country of birth.)

Select up to three factors that would figure most importantly in your decision to start a business in the above location: Select up to three: access to markets, access to capital, access to technology, availability of skilled workers, cost of labor, infrastructure (power, transportation, telecommunications, etc.), lifestyle, financial or other incentives from the government.

Select up to three problem areas that would deter you from starting a business in *COUNTRY* Select up to three: immature market conditions, unreliable infrastructure (power, transportation, telecommunications, etc.), lack of access to capital, unfair competition, poor business services, government bureaucracy/regulation, inadequate legal system (such as protection of intellectual property rights), inferior quality of life, quality or cost of manpower.

About Your Start-Up Company

What year was your firm incorporated?

Where was it incorporated?

If your firm is publicly listed, indicate where.

How many of the original founders are from *COUNTRY*?

Select up to three initial sources of capital for financing the start-up: Select up to three: personal savings, family members, relatives and friends, angel/individual investors, venture capital company, commercial bank loan, government funding, other, please specify.

Select up to three sources of capital for subsequent rounds of funding: Select up to three: personal savings, family members, relatives and friends, angel/individual investors, venture capital company, commercial bank loan, government funding, other, please specify.

If your firm is currently located or was ever located within an incubator or part of an entrepreneur-in-residence program, specify the number of months.

How much capital has your firm raised to date?

What, if any, difficulties have you experienced in raising capital? Access to investors, language difficulty during presentation, inadequate business plan, inadequate technical skills, inadequate management skills, other, please specify.

Have any of the following networks helped you to overcome these difficulties? Friends and family, current or former colleagues, alumni networks, professional associations, other, please specify.

Approximately what percentage of the full-time employees in your company are from *COUNTRY*?

Business Relationships with Country of Birth

Does your company have business relationships in *COUNTRY*?

What year were the business relationships first established?

Where are the business relationships located?

What is the nature of the business relationships your company has in *COUNTRY*? Check all that apply: partially or fully owned subsidiary, joint venture or partnership with local company, subcontractor or materials/parts supplier, sales/marketing office, distributor, other, please specify.

What is the nature of the work done for your company in *COUNTRY*? Check all that apply: research and development, software or content development, hardware design, hardware manufacturing/assembly, software services (coding, programming, maintenance, etc.), back-office or remote services, marketing and sales, other, please specify.

Select up to three key factors that influenced your decision to set up business relationships in *COUNTRY* Select up to three: access to market, access to capital, access to technology, availability of skilled workers, low cost of labor, reliable infrastructure (power, transportation, telecommunications, etc.), financial incentives offered by the government, other, please specify.

Select up to three key problem areas that your company faces in *COUNTRY* Select up to three: immature market conditions, lack of access to capital, unreliable infrastructure (power, telecommunications, transportation, etc.), unfair competition, poor business services (banks, accounting, legal services, etc.), government bureaucracy/regulation, inadequate legal system (such as protection of intellectual property rights), political or economic uncertainty, poor quality of manpower, other, please specify.

If you do not have business relationships or operations in *COUNTRY* would you consider setting up these relationships in the future?

Where would you consider locating your company's future business relationships or operations in *COUNTRY*?

Common Question Before Thank You Page

What are your key concerns with quality of life in Silicon Valley?

Appendix B

Source of Survey Sample

Name of Association	No. of Members Surveyed	Response Rate (%)
Asian American Manufacturers Association (AAMA)	1,369	17
Chinese American Semiconductor Professionals Association (CASPA)	1,071	4
Chinese Information and Networking Association (CINA)	1,200	11
Chinese Institute of Engineers, San Francisco Bay (CIE-SF)	400	1
Chinese Internet Technology Association (CITA)	929	12
Chinese Software Professionals Association (CSPA)	1,809	52
Cnetwork	2,500	4
Hua Yuan Science and Technology Association	460	14
Korean Information Technology Network (KIN)[a]	70	27
Korean American Professionals Association (KASE)[a]	550	2
Monte Jade Science and Technology Association (MJSTA)	567	12
National Taiwan University Alumni Association (NTUAA)	1,200	5
North America Chinese Semiconductor Association (NACSA)	1,000	3
Peking University Alumni Association of Northern California (PKUAANC)	351	19
Silicon Valley Chinese Engineers Association (SCEA)	3,400	3
Silicon Valley Indian Professionals Association (SIPA)	1,000	N.A.
The Indus Entrepreneur (TiE)[b]	6,461	17

[a]KIN and KASE joined the survey late and their members did not receive prior notification of the survey and its importance from association leadership (which Indian and Chinese associations provided). This may explain the small number of responses.

[b]TiE membership in the San Francisco Bay Area is 2,200; however, the organization provided almost three times as many email addresses. Their list included names of many nonmembers and it duplicated all of the names on the SIPA list.

Appendix C

Demographic Profile of Survey Respondents

This profile provides an overview of the demographic, educational, employment, and immigration status of the survey respondents. Although this sample is likely biased toward the most active of Silicon Valley's foreign-born professionals, it confirms a prior research finding that highly skilled immigrants are more highly educated than their U.S.-born counterparts and that Indian immigrants tend to be concentrated in the software industries and Chinese immigrants in the semiconductor industries. There are also unexpected findings, such as the large proportion of Chinese women in the workforce and the concentration of Indians in executive and managerial positions.

Figure C.1 details the place of birth of the foreign-born respondents to the survey. The "Other foreign" category includes respondents from

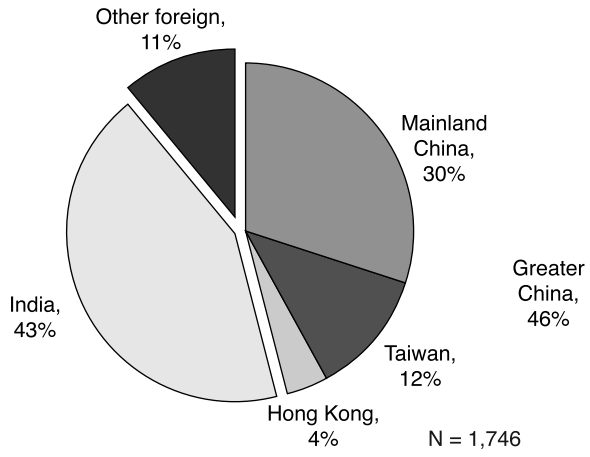


Figure C.1—Foreign-Born Respondents, by Place of Birth

elsewhere in Asia (55 percent) as well as from Europe (19 percent), Africa (11 percent), Canada (8 percent), and elsewhere.

Age and Gender

The immigrants surveyed are, on average, younger than their U.S.-born counterparts. And although the majority of these foreign-born professionals are men, women are more highly represented among Chinese than among Indian immigrants.

- Taiwanese are older than other immigrants, with the majority age 36 or older, whereas more than half of the Mainland Chinese and Indians are age 18–35 (Figure C.2). As noted above, this age distribution reflects their earlier arrival in the United States.
- Thirty-three percent of the Mainland Chinese immigrants surveyed are women, compared to 9 percent of the Indians and 29 percent of the U.S.-born workers (Figure C.3).

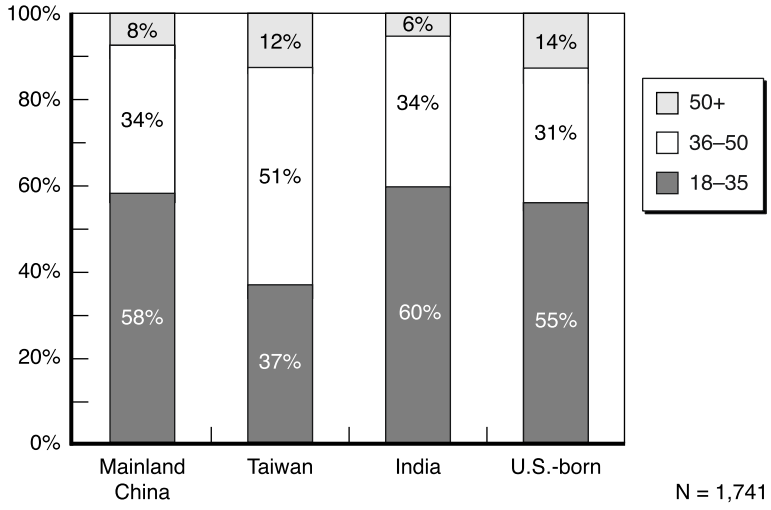


Figure C.2—Age of Respondents, by Country of Birth

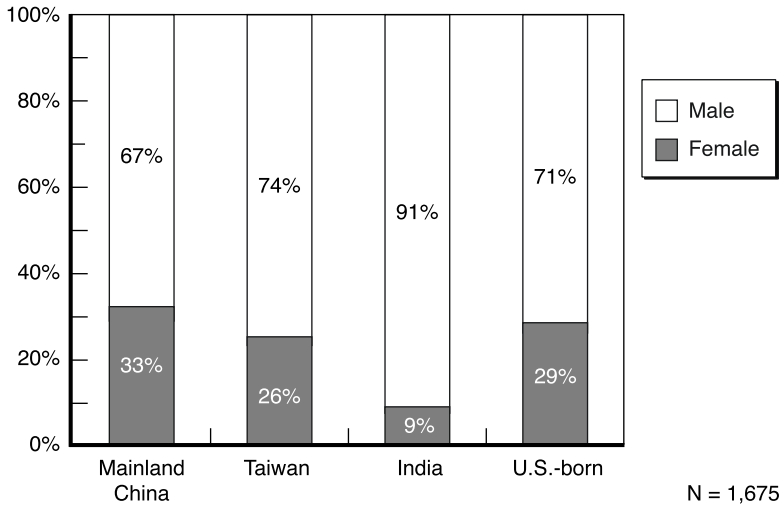


Figure C.3

Figure C.3—Gender of Respondents, by Country of Birth

Education

The immigrant professionals surveyed are more highly educated than their U.S.-born counterparts. The Indians are more likely to hold MBAs and to have earned their highest degree from their native country, whereas a majority of the Chinese hold graduate degrees from the United States in scientific, technical, or engineering fields.

- Eighty-five percent of the foreign-born workers surveyed hold scientific, technical, or engineering degrees, compared to only 43 percent of the U.S.-born workers (Figure C.4).
- Eight-six percent of the Mainland Chinese in the survey hold postgraduate degrees, as do 84 percent of the Taiwanese and 78 percent of workers born in India. This compares to 55 percent of the U.S.-born population (Figure C.5).
- Chinese immigrants are most likely to have Ph.D.s: 28 percent of Mainlanders and 16 percent of Taiwanese hold Ph.D.s compared to 19 percent of those U.S.-born and 9 percent of Indians (Figure C.5).

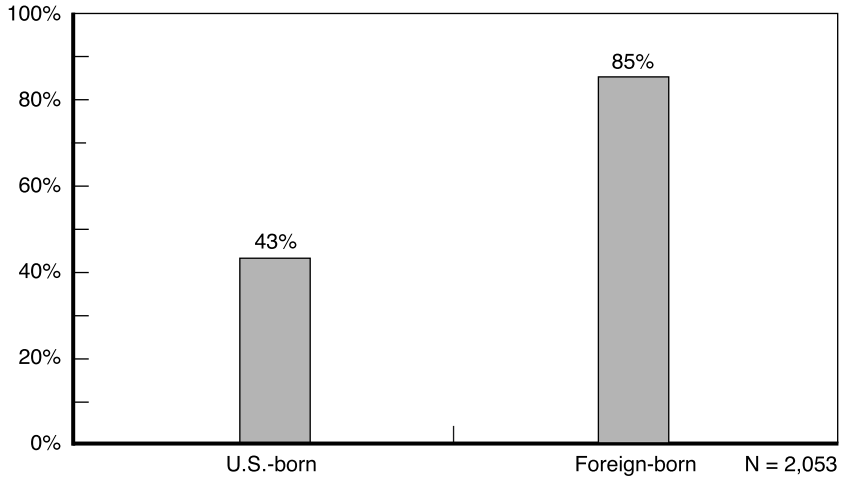
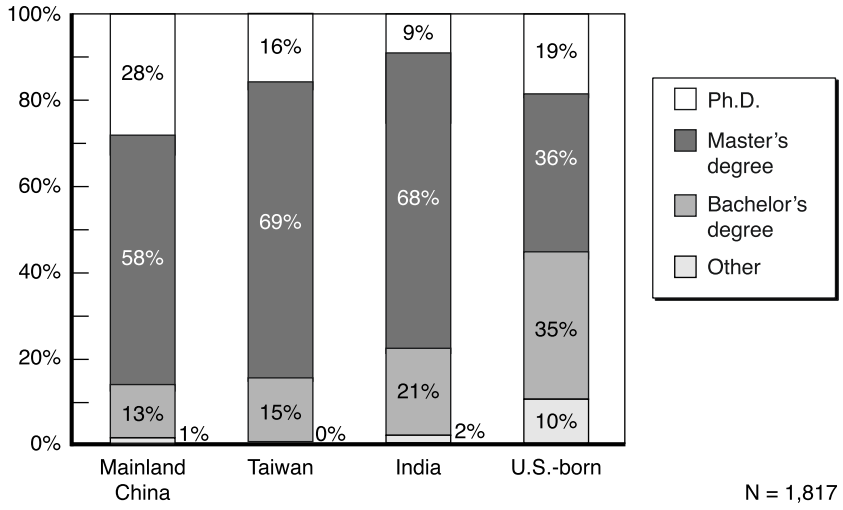


Figure C.4—Percentage of Respondents with Scientific, Technical, or Engineering Degrees



NOTE: The category "other" includes high-school and two-year college graduates as well as no-answers.

Figure C.5—What Is Your Highest Educational Degree?

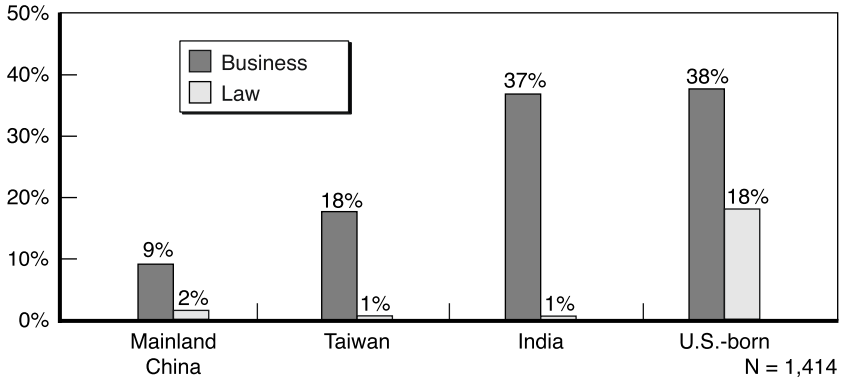


Figure C.6—Percentage of Respondents with Professional Degrees

- Indian immigrants are most likely to hold MBAs: 37 percent of the region's Indians hold MBA degrees compared to 38 percent of those U.S.-born, 18 percent of Taiwanese, and 9 percent of Mainland Chinese (Figure C.6).
- Over 80 percent of the foreign-born Chinese surveyed earned their highest degree in the United States compared to 63 percent of Indians. One-third of Indian immigrants surveyed earned their highest degree in India (Figure C.7).

Employment Status

The Mainland Chinese immigrants surveyed are concentrated in nonmanagerial technical occupations in the semiconductor, computer, and communications industries. The Indians, by contrast, are far more likely to be in either executive or managerial occupations in the software or communications industries.

- Twenty-three percent of Mainlanders report their positions as executive or managerial, compared to 67 percent of Indians, 55 percent of Taiwanese, and 60 percent of U.S.-born workers (Figure C.8).

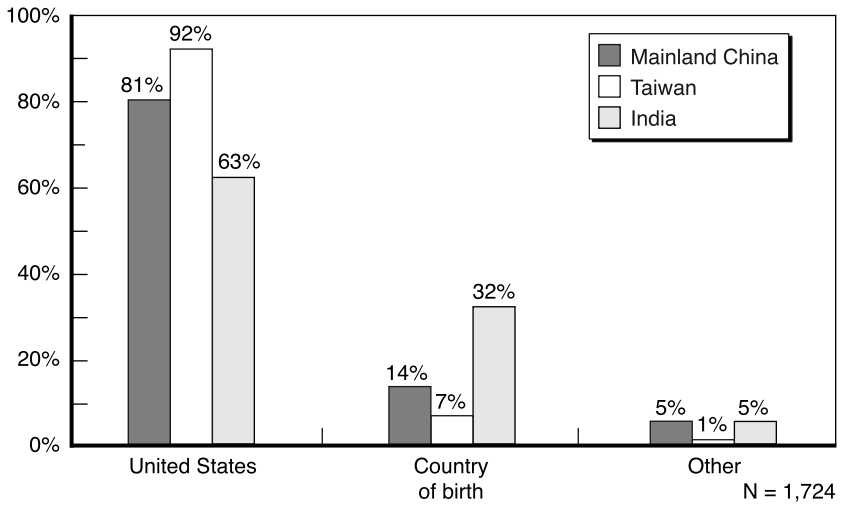


Figure C.7—Where Did You Earn Your Highest Educational Degree?

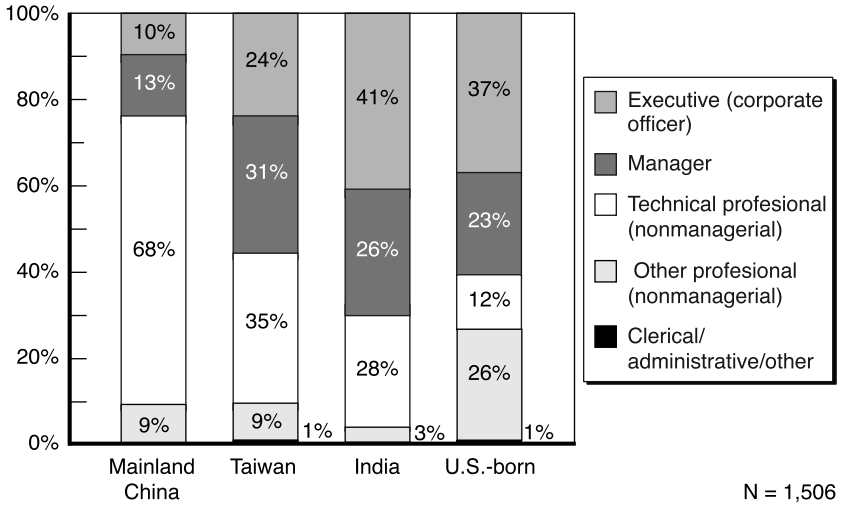


Figure C.8—Please Describe Your Current Job

- Thirty-eight percent of Indian immigrants work in the software industry compared to 26 percent of Mainland Chinese, 19 percent of Taiwanese, and 18 percent of U.S.-born workers. Twenty percent of Taiwanese and 18 percent of Mainland Chinese immigrants work in the semiconductor industry, compared to 9 percent of Indian and 5 percent of U.S.-born workers (Figure C.9).
- Foreign-born engineers are less likely to work in small companies (companies with fewer than 100 employees) than their U.S.-born counterparts. Twenty-seven percent of Mainland Chinese, 42 percent of Taiwanese, and 43 percent of Indians work in small companies, compared to 54 percent of U.S.-born workers (Figure C.10).

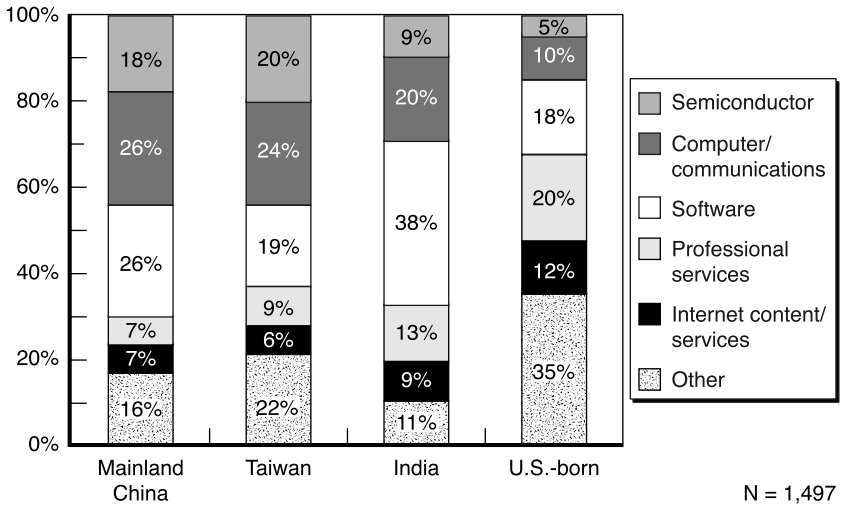


Figure C.9—What Industry Does Your Company Belong To?

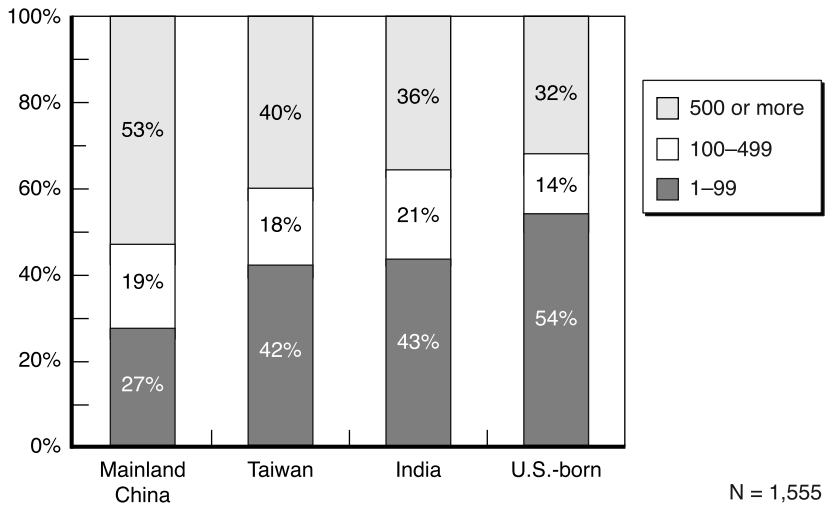


Figure C.10—How Many Employees Work at Your Company at All Locations?

Immigration Status

The foreign-born professionals surveyed fall into three main categories: U.S. citizens, permanent residents of the United States (green card holders), and those who are here on temporary H1-B visas (for a maximum of six years) or other visas (Figures C.11a and C.11b).

- Thirty-eight percent of those surveyed are U.S. citizens, 30 percent are permanent residents, and 24 percent hold H-1B visas.
- The Chinese surveyed are more likely to be U.S. citizens (45 percent) than their Indian counterparts (32 percent) whereas the Indians are more likely to be permanent residents (34 percent) or H1-B visa holders (29 percent).

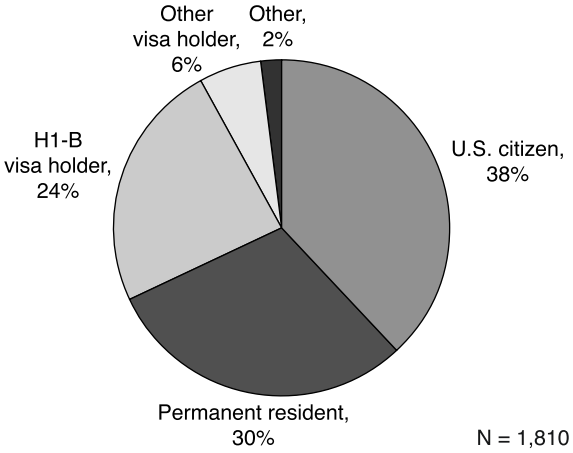


Figure C.11a—Immigration Status of Foreign-Born Professionals

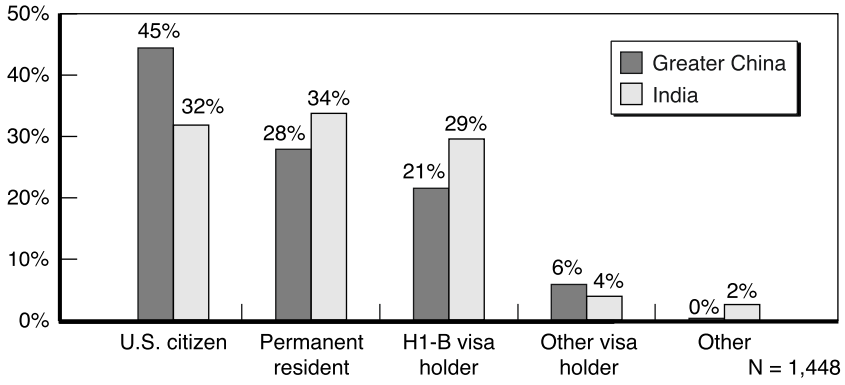


Figure C.11b—Immigration Status of Foreign-Born Professionals

Appendix D

Technical Note for Analyzing Multiple-Answer Questions

Analyzing the percentage of people who checked a multiple-answer question is complex. People may check several responses; therefore, the simple calculation of dividing by the number of checked responses will provide a different result from the calculation of dividing by the number of respondents. That is, the magnitude of answers would be different. In our case, most of the multiple-answer questions were asking about problem areas, such as "Select up to three key problem areas that would deter you from starting a business in your home country." With a different magnitude, the severity of problems would appear differently as well.

Having the original dataset in spreadsheet format, we conducted the following procedure to obtain the correct magnitude in responses. The more detailed explanation in Microsoft Excel is provided in Table D.1.

Table D.1

Detailed Procedure in Excel

Step	Procedure	Remark
1	Replace '.' to '1'	No response is shown as '.'
2	Count sum of '1's in a new column	
3	Sort all responses by the new column (from Step 2)	
4	Delete all rows with the highest number	To exclude no-answer respondents
5	Count the number of people who answered	
6	Merge all the columns into one column	To apply Excel's Pivot Table
7	Use Pivot Table to count responses by types	
8	Divide the numbers of Step 7 by the number of respondents	

1. Identify the number of respondents (in contrast to those who did not respond to that question),
2. Count the number of responses by using the Pivot Table, and
3. Obtain the percentage of respondents by dividing (2) by (1).

Appendix E

Results of Regression Analysis

Table E.1

Results of Regression Analysis

	Dependent Variable: FOUNDING		
Independent Variable	B	Wald	Significance
Constant	–0.6333	6.8022	0.0091
AGE	0.6115	50.0129	0.0000
SEX	–0.7717	24.8485	0.0000
BORNUSA			
EDUCATION	0.2662	7.4806	0.0062
MBA dummy	0.6321	19.0411	0.0000
LAW dummy	–0.6980	1.9613	0.1414
MAINLAND	–1.4167	52.5474	0.0000
TAIWAN	–0.8174	12.2218	0.0005
INDIA	–0.4183	5.5202	0.0188
Model		Binary Logit	
R-square			
No. of observations		1524	
	Dependent Variable: MEETING		
Independent Variable	Coefficient	T–statistics	Significance
Constant	2.1993	16.4275	0.0000
AGE	0.1521	3.4119	0.0007
SEX	–0.1079	–1.3600	0.1740
BORNUSA	0.2322	1.8633	0.0626
EDUCATION	–0.0008	–0.0160	0.9873
MBA dummy	0.2914	3.7862	0.0002
LAW dummy	0.4933	2.2861	0.0224
MAINLAND	–0.2543	–2.3100	0.0210
TAIWAN	–0.1601	–1.1802	0.2381
INDIA	–0.5403	–5.3203	0.0000
Model		OLS	
R-square		0.0606	
No. of observations		1748	

Table E.1 (continued)

	Dependent Variable: RETNKNOW		
Independent Variable	Coefficient	T–statistics	Significance
Constant	0.4524	7.0119	0.0000
AGE	0.0244	1.0923	0.2749
SEX	–0.0591	–1.4741	0.1407
BORNUSA			
EDUCATION	0.0893	3.4610	0.0006
MBA dummy	0.0317	0.8464	0.3975
LAW dummy	–0.1508	–1.1102	0.2671
MAINLAND	0.1430	2.8388	0.0046
TAIWAN	0.4480	7.2723	0.0000
INDIA	0.1672	3.6306	0.0003
Model		OLS	
R-square		0.0519	
No. of observations		1509	
	Dependent Variable: TRAVEL		
Independent Variable	Coefficient	T–statistics	Significance
Constant	0.7595	8.0947	0.0000
AGE	0.2218	6.8395	0.0000
SEX	–0.2226	–3.8507	0.0001
EDUCATION	–0.0191	–0.5079	0.6116
MBA dummy	0.1386	2.5557	0.0107
LAW dummy	0.0226	0.1175	0.9065
MAINLAND	–0.3730	–5.1069	0.0000
TAIWAN	–0.1251	–1.4025	0.1610
INDIA	–0.3692	–5.5206	0.0000
R-square		0.0808	
No. of observations		1518	
	Dependent Variable: CONTRACT		
Independent Variable	B	Wald	Significance
Constant	–0.7734	10.9157	0.0010
AGE	0.4692	32.7435	0.0000
SEX	–0.3185	4.5447	0.0330
EDUCATION	–0.0154	0.0267	0.8702
MBA dummy	0.4212	9.9605	0.0016
LAW dummy	0.6157	1.7073	0.1913
MAINLAND	–0.5570	9.3592	0.0022
TAIWAN	–0.3842	3.0038	0.0831
INDIA	–0.1336	0.6611	0.4162
R-square			
No. of observations		1515	

Table E.1 (continued)

	Dependent Variable: ADVISOR		
Independent Variable	B	Wald	Significance
Constant	–1.2859	24.6576	0.0000
AGE	0.5301	34.6522	0.0335
SEX	–0.3887	4.5224	0.9452
EDUCATION	–0.0073	0.0047	0.2254
MBA dummy	0.1745	1.4694	0.0005
LAW dummy	1.7432	12.1077	0.0000
MAINLAND	–1.1885	33.4104	0.0023
TAIWAN	–0.7446	9.2867	0.3315
INDIA	–0.1661	0.9432	0.0000
R-square			
No. of observations		1514	
	Dependent Variable: INVESTMENT		
Independent Variable	Coefficient	T–statistics	Significance
Constant	0.1414	2.2168	0.0268
AGE	0.1192	5.5954	0.0000
SEX	–0.0751	–1.9798	0.0479
BORNUSA	0.0540	0.9088	0.3636
EDUCATION	–0.0146	–0.5863	0.5577
MBA dummy	0.0629	1.7148	0.0866
LAW dummy	0.0651	0.6341	0.5261
MAINLAND	–0.1017	–1.9345	0.0532
TAIWAN	–0.0334	–0.5144	0.6070
INDIA	0.0242	0.5006	0.6167
Model		OLS	
R-square		0.0358	
No. of observations		1731	
	Dependent Variable: GOVERNMENT		
Independent Variable	B	Wald	Significance
Constant	–1.5787	38.6449	0.0000
AGE	0.6009	47.4790	0.0000
SEX	–0.1406	0.7972	0.3719
BORNUSA			
EDUCATION	0.0068	0.0046	0.9458
MBA dummy	0.0636	0.1922	0.6611
LAW dummy	0.7423	2.4503	0.1175
MAINLAND	0.0616	0.1064	0.7443
TAIWAN	–0.5190	4.6125	0.0317
INDIA	–0.3421	3.7999	0.0513
Model		Binary Logit	
R-square			
No. of observations		1512	

Table E.1 (continued)

	Dependent Variable: RETNFUT		
Independent Variable	Coefficient	T–statistics	Significance
Constant	1.9299	13.5003	0.0000
AGE	–0.4119	–8.3912	0.0000
SEX	–0.1198	–1.3296	0.1839
BORNUSA			
EDUCATION	0.0344	0.6049	0.5454
MBA dummy	–0.0657	–0.8193	0.4128
LAW dummy	–0.3590	–1.2292	0.2193
MAINLAND	0.2107	1.9054	0.0570
TAIWAN	–0.1694	–1.2275	0.2199
INDIA	0.2750	2.7466	0.0061
Model		OLS	
R-square		0.0865	
No. of observations		1121	

Table E.2

Definition of Variables Used in Regression

Name	Question	Coding				
TRAVEL	How often have you traveled to *COUNTRY* for business purposes, on average during the past three years?	0=never	1=about once a year	2=2–4 times a year	3=5+ times a year	
MEETING	How often do you attend meetings of professional, immigrant, or alumni associations?	0=never	1=once a year	2=2–3 times a year	3=4–6 times a year	4=Once or more a month
CONTRACT	Have you helped others arrange business contracts in *COUNTRY*?	0=no	1=yes			
ADVISOR	Have you ever served as an advisor or consultant for companies from *COUNTRY*?	0=no	1=yes			
GOVERNMENT	How often do you meet with government officials from *COUNTRY*?	0=never	1=sometimes + regularly			
RETNKNOW	How many of your friends or colleagues have returned to *COUNTRY* to work or start a company?	0=none	1=1–9	2=10–19	3=21 or more	

Figure E.2 (continued)

Name	Question	Coding				
INVESTMENT	Have you invested your own money in start-ups or venture funds in *COUNTRY*?	0=no	1=yes, only once	2=yes, more than once		
FOUNDING	Have you been involved in founding or running a start-up company?	0=no	1=yes part and full			
RETNFUT	Would you consider returning to live in *COUNTRY* in the future?	0=quite unlikely	1=somewhat unlikely	2=somewhat likely	3=quite likely	4=don't know
AGE	Please specify your age.	0=18–25	1=26–35	2=35–50	3=50+	
SEX	Please specify your gender.	0=male	1=female			
BORNUSA	Were you born in the United States?	0=no	1=yes			
MAINLAND	Born in Mainland China	0=non-Mainland	1=Mainland			
TAIWAN	Born in Taiwan	0=non-Taiwan	1=Taiwan			
INDIA	Born in India	0=no	1=yes			
EDU	What is the highest educational degree that you have attained?	0=High school	1=bachelor's	2=master's and MBA	3=Ph.D., JD, MD	
MBA	MBA dummy	0=non-MBA	1=MBA			
LAW	Law dummy	0=non-law degree	1=JD or LLM			

About the Author

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AnnaLee Saxenian is a professor at the University of California at Berkeley with a joint appointment in the School of Information Management and Systems and the Department of City and Regional Planning. She is an internationally recognized expert on regional economies and the information technology sector, and she has written extensively about entrepreneurs and innovation in Silicon Valley and elsewhere. Her publications include *Silicon Valley's New Immigrant Entrepreneurs* and *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. She holds a Ph.D. in political science from MIT, a master's degree in regional planning from the University of California at Berkeley, and a bachelor's degree in economics from Williams College in Massachusetts.

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