

IMMIGRANT ENTREPRENEURS IN SILICON VALLEY

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This article documents the growing presence of highly educated and technically skilled Indian and Chinese immigrants in the Silicon Valley workforce. These immigrants are employed in the high-tech sectors of the economy at greater rates than the general population, are more likely to work in manufacturing than services, and have a greater degree of professional employment than the norm. Census and corporate data suggest that Indian- and Chinese-run businesses are already a substantial force in the Silicon Valley economy comprising almost one-quarter of high-tech firms. Finally this article provides examples of local networks that support entrepreneurial dynamism among these immigrant groups and explores the implications of this research for economic development policy.

After graduating from the University of California at Berkeley, Alex Au worked for more than a decade in a series of Silicon Valley technology companies. By 1983, he felt that he had reached a glass ceiling and started the Vitelic Semiconductor Corporation in his garage. Au initially drew on connections in his native Hong Kong to raise capital and later to develop the Asian market for the firm's products. When Vitelic merged with Taiwan based Mosel in 1991, the combined business had over \$150 million in sales and hundreds of employees in San Jose, Taiwan, and Hong Kong.

Prabhu Goel sold Gateway Design Automation, the firm he had started on a shoestring budget in 1982, to another Silicon Valley software company in 1991 for \$80 million and decided to become a venture capitalist. Today Goel divides his time between Silicon Valley and his native India, investing in the projects of promising Indian entrepreneurs in California through a group called The Indus Entrepreneur, while also funding and advising start-ups in places like Bangalore and Bombay.

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Silicon Valley is widely known for its most revolutionary product, the integrated circuit, or IC. However the saying in the local technology community that "Silicon Valley is run by ICs" refers not to semiconductors, but to Indians and Chinese. Immigrants make up a growing share of the professional and technical workforce in Silicon Valley, and many of these skilled immigrants are becoming active entrepreneurs. Chinese and Indian engineers, in particular, have started some of the region's most successful technology companies, including Sun Microsystems, Cirrus Logic, Vitelic, Gateway Design, Solectron and Network Peripherals, as well as hundreds of less well-known firms that make up the region's dense industrial infrastructure.

This highly skilled immigrant workforce is one of Silicon Valley's least understood assets. And its significance has increased unexpectedly in the past decade as Chinese and Indian engineers, like Au and Goel, have returned to their home countries or exploited their ties to Asia by building careers that allow them to operate simultaneously on both sides of the Pacific. These newly mobile immigrants are building powerful social and business networks that offer access to sources of capital, information, skills, and contacts — both local and distant — that support entrepreneurial success and the integration of Silicon Valley into fast growing Asian markets.

There is a large scholarly literature on ethnic entrepreneurs that documents the growing presence of immigrant businesses in industrial societies and theorizes about non-market mechanisms, or "ethnic strategies", ranging from ethnic social ties to rotating credit associations, that allow immigrants to mobilize the resources needed to build successful businesses (Waldinger and Bozorgmehr 1996; Waldinger, et al. 1990; Light and Bonacich 1988). However, this literature locates immigrants almost exclusively in businesses that are marginal to the mainstream economy such as small-scale restaurants, retail, and sweatshop manufacturing. Moreover, it documents the tendency to create largely self-contained immigrant niches, or "ethnic enclaves" (Portes 1995) that have minimal ties to the outside economy. Even scholars who focus on global capital and labor flows (Sassen 1988) see immigrant social networks reproducing third-world conditions in advanced economies, rather than contributing to opportunities for entrepreneurship among more highly skilled groups.

In contrast, Silicon Valley's new immigrant entrepreneurs are highly skilled engineers who are active in the most technologically sophisticated sectors of the economy. Moreover, while they benefit from supportive ethnic networks that offer access to local sources of skill, capital, technology, and information, they are also creating comparable business ties to fast-growing regions in Asia. These "transnational entrepreneurs" provide an important but largely unrecognized source of competitive advantage by linking dynamic regions in an increasingly global economy.

This article reports on the results of the first phase of a longer term research project on the new immigrant entrepreneurs in Silicon Valley.¹ It documents the growing presence of highly educated and technically skilled immigrants (largely Asian-born) in the Silicon Valley workforce in recent decades, and presents data that suggest that Indian and Chinese-run businesses are already a substantial force in the Silicon Valley economy. Finally, it provides examples of local networks that support this entrepreneurial dynamism among these immigrant groups. Future work will document the way that these immigrants are becoming transnational entrepreneurs by extending their social and professional networks to distant regions such as Taipei and Bangalore.

Data and Methodology

This research draws on two different types of data. First, we analyze available quantitative data documenting demographic and employment trends among Asians in Silicon Valley. Our analysis of education, sectoral employment, and occupations draws from the Public Use Microdata Sample (PUMS) of the 1990 Census, which includes information from five percent of the total census sample. These are the only comprehensive data available on immigrants and industry in the U.S. and unfortunately are quite dated. All of the anecdotal evidence suggests that the Asian presence in Silicon Valley has increased substantially since 1990. We thus believe that the data presented here represent a significant undercount but will need to await the 2000 census for empirical confirmation.²

Our analysis of ethnic entrepreneurship is drawn from a customized Dun & Bradstreet corporate database of all high-tech firms founded in the Silicon Valley region between 1980 and

1996. In addition, we cross-check these findings with two other corporate databases of high-tech firms, one from CorpTech and the other from Venture One.

The findings on ethnic networks draw from a series of over 100 in-depth interviews with ethnic entrepreneurs and engineers in Silicon Valley high-tech firms. These interviews were conducted during 1996 and 1997.

The New Asian Immigrants

Asian immigration to the U.S. reaches as far back as the latter part of the 18th century, but the modern history of immigration started with the Immigration Act of 1965.³ Before this act, Asians were excluded through a variety of Acts based on their race.⁴ The Act of 1965 mandated the admission of immigrants based on skill rather than race. Although the Act maintained quotas for each country, immigration from Asia rose dramatically after this Act was passed because Asians could now immigrate based on skilled labor preferences. While earlier immigrants tended to be drawn from a wide range of backgrounds, the new Asian immigrants are almost all highly educated professionals.

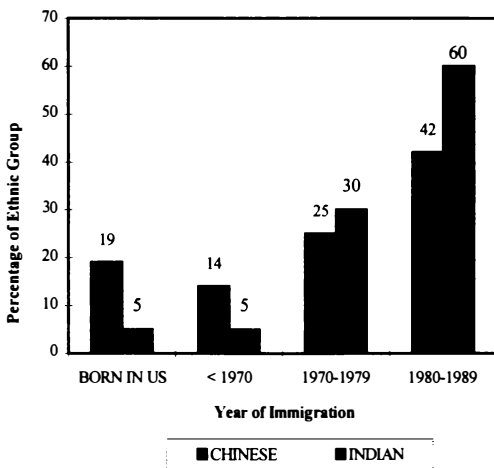
The foreign born population in the San Francisco Bay Area has grown significantly in the past two decades. The immigrant population of Santa Clara County, in the heart of Silicon Valley, doubled to 347,000 (or 23 percent of the total) between 1980 and 1990, thereby surpassing San Francisco county for the largest concentration of immigrants in the entire Bay Area (Alarcon 1997). The concentration of immigrants is even greater within the high-tech sector of the economy. In 1990, 30 percent of Silicon Valley's high-tech workforce was foreign born, and of those, 64 percent were of Asian origin.⁵ Moreover, Asian immigrants are even more highly concentrated in the professional occupations: in 1990, a third of all scientists and engineers in high-tech industries were foreign born, and 67 percent of those were Asian. Because the majority (62 percent) of these skilled immigrants are of Chinese⁶ or Asian Indian origin, the rest of this article focuses primarily on those two groups.

Chinese and Indian (im)migration into the Silicon Valley region is a relatively recent phenomenon. In 1990 there were 28,520 people of Asian Indian descent and 92,020 of Chinese

descent in the region. As Figure 1 shows, only 5 percent of the Indians and 19 percent of the Chinese were born in the U.S.⁷, 90 percent of the Indians immigrated after 1970 and 60 percent immigrated after 1980. Compared to the Indians, the Chinese are less recent immigrants: 67 percent immigrated after 1970; 42 percent after 1980. Thus, the bulk of Silicon Valley's population of Chinese and Indian ethnic origin are recent immigrants.

Figure 1

Year of Immigration by Ethnicity



Source: U.S. Census 1990.

The Indian and Chinese population in Silicon Valley is highly educated. Fifty-six percent of the adult Indians and 47 percent of the Chinese have at least Bachelor's degrees, compared to only 30 percent for the white population. More strikingly, these immigrant populations hold graduate degrees (M.S. and Ph.D.) at far greater rates than their Caucasian counterparts: 32 percent of the Indian and 23 percent of the Chinese hold advanced degrees, compared to only 11 percent for the white

population.⁸ The superior educational attainment of these groups is even more pronounced among workers in high-tech industries: 54 percent of the Indians and 41 percent of the Chinese have graduate degrees, compared to 18 percent for the whites.

By contrast, other Asian groups tend to be less educated than the Indians and Chinese, both in the general adult population and among high-tech workers. While Japanese and Koreans have levels of higher education comparable to the white population, Filipinos and Vietnamese tend to be significantly less educated. Even among the high-tech workforce, only 3 percent of the Filipinos and 5 percent of the Vietnamese have graduate degrees.

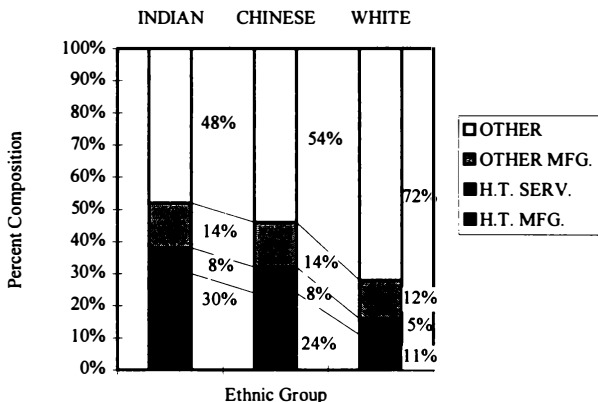
We have seen that Silicon Valley has a large highly-educated, foreign born workforce. Not surprisingly, the demand for these new immigrants is particularly high in the region's technology industries. While a quarter of the total workforce in Silicon Valley is foreign born, almost one-third of the region's high-tech workers are foreign born; and of these foreign born workers, 64 percent are of Asian descent.

Given their high levels of education it is not surprising that Indian and Chinese workers are employed in the high-tech sectors of the economy at greater rates than the general population. As Figure 2 shows, 38 percent of the Indian workers and 32 percent of the Chinese workers are employed in high-tech, compared to 16 percent for the white population. In other words, while only 1 percent of the Silicon Valley adult population is Indian and 4 percent is Chinese, of the engineers and scientists in high-tech industries, 5 percent are Indian and 11 percent are Chinese. While Vietnamese (33 percent) and Filipinos (25 percent) are also relatively well represented in the total high-tech workforce, we shall see that their relatively lower educational attainment is reflected in their occupational status.

Figure 2 also shows that within the high-tech sectors of the economy, both Indians and Chinese are more likely to be employed in manufacturing than in services. While only 11 percent of the white population is employed in high-tech manufacturing, 30 percent of the Indian workers and 24 percent of the Chinese workers work in this sector. High-tech services employ 8 percent of both Indian and Chinese, and 5 percent of the white workers.

Figure 2

Sectoral Employment by Ethnicity



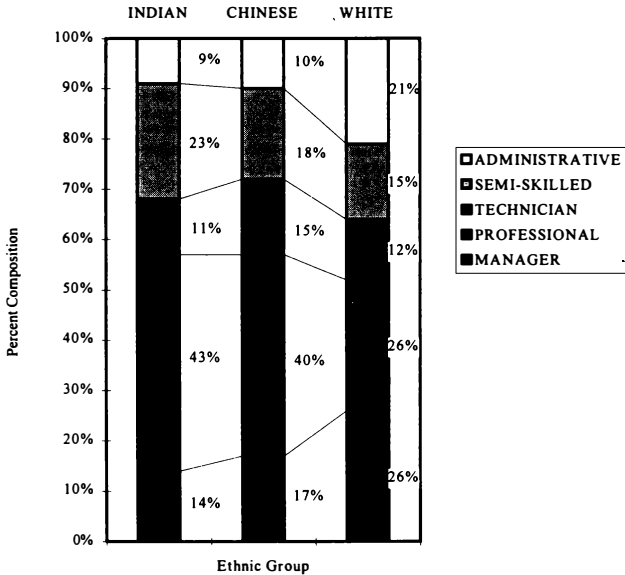
Source: U.S. Census 1990.

The relatively higher educational attainment of Indians and Chinese is reflected in their occupational status.⁹ Forty-two percent of all working Indians and 44 percent of working Chinese in Silicon Valley are professionals or managers, compared to only 36 percent of the region's whites. The relatively greater representation of Indians and Chinese in the professional and managerial categories is even more pronounced in the high-tech sectors, where 57 percent of both the Indians and Chinese are in professional/managerial occupational categories, compared to 52 percent of whites (see Figure 3). Among other Asians, the Japanese are relatively well represented in professional and managerial occupations in Silicon Valley, whereas Filipinos and Vietnamese are predominantly found in the semi-skilled and administrative occupations.

It is worth noting that both Indians and Chinese are more highly concentrated in professional than managerial occupations within high-tech firms. While 43 percent of the Indians, 40

Figure 3

Occupation by Ethnicity



Source: U.S. Census 1990.

percent of the Chinese, and 26 percent of the whites are professionals, only 14 percent of the Indians and 17 percent of the Chinese are managers, compared to 26 percent of the whites (see Figure 3). Put another way, while Indians account for 2 percent of Silicon Valley's high-tech professionals, they represent less than 1 percent of the managers. Similarly, while 6 percent of the region's high-tech professionals are Chinese, only 4 percent of them are managers.

The relatively low representation of Chinese and Indians in managerial positions could be due to a bias among these groups towards a technical education (as opposed to business), and/or

the existence of subtle forms of discrimination based on race, i.e., the "glass ceiling." The predominance of Chinese and Indians in technical as opposed to broader managerial positions is also borne out by Table 1 which classifies the senior executives of the region's high-tech companies.¹⁰ Both Chinese and Indians are better represented in R&D than in any of the other managerial functions.

Table 1

Chinese and Indian Executives in Different Functions in Silicon Valley High-technology Firms

| | FINANCE | MARKETING | SALES | R&D |
|---------|---------|-----------|-------|-----|
| CHINESE | 208 | 158 | 152 | 224 |
| INDIAN | 61 | 53 | 50 | 80 |

Source: Corptech 1996.

The New Immigrant Entrepreneurs

Silicon Valley's Chinese and Indian engineers are increasingly starting technology companies. In contrast to their predecessors in low technology services and manufacturing sectors, these "new" immigrant entrepreneurs are a growing presence in the technologically dynamic and globally competitive sectors of the Silicon Valley economy.

Almost one-quarter (23 percent) of Silicon Valley's high-tech firms are run by Chinese or Indians.¹¹ As Table 2 shows, of the 7,769 high-tech firms started in Silicon Valley from 1980 through 1996, 1,350 (17 percent) were run by Chinese executives and 436 (6 percent) by Indians. Moreover, this likely understates the scale of immigrant entrepreneurship because firms that were started by Chinese or Indians but have a non-Chinese or non-Indian CEO are not included. Our interviews suggest that this has often been the case in Silicon Valley, and is a more likely source of bias than the opposite scenario, i.e., firms started by someone other than a Chinese or Indian and having a Chinese or Indian CEO. All told, Chinese- and Indian-run firms accounted for a total of \$12.5 billion in sales and 46,290 jobs in Silicon Valley in 1996.

Table 2

*Silicon Valley's High-technology Companies
Started from 1980 to 1996*

| | ALL FIRMS | CHINESE (%) | INDIAN (%) |
|------------------------|-----------|---------------|--------------|
| NUMBER OF FIRMS | 7,769 | 1,350 (17%) | 436 (6%) |
| TOTAL SALES (MILLIONS) | \$ 83,367 | \$9,541 (11%) | \$2,961 (4%) |
| TOTAL EMPLOYMENT | 344,028 | 35,214 (10%) | 11,076 (3%) |

Source: Dun & Bradstreet 1996.

Temporal breakdowns of the data suggest that the rate of immigrant entrepreneurship in Silicon Valley is also increasing rapidly. While Chinese and Indians started 13 percent of Silicon Valley's high-tech companies between 1980 and 1985, they started 21 percent in the next five years. And between 1991 and 1996, they accounted for more than one-fourth (27 percent) of the region's high-tech startups.

Table 3

Silicon Valley High-technology Firms Started by Period

| | 1980-85 | 1986-90 | 1991-96 |
|----------------------|-----------|-----------|-----------|
| ALL FIRMS | 1560 | 2149 | 4060 |
| CHINESE (%) | 162 (10%) | 364 (17%) | 824 (20%) |
| INDIAN (%) | 52 (3%) | 90 (4%) | 294 (7%) |
| CHINESE + INDIAN (%) | 13% | 21% | 27% |

Source: Dun & Bradstreet 1996.

These Chinese and Indian firms remain small relative to the high-tech sector as a whole, with an average of 25 and 26 employees per firm compared to 44 employees per firm for all firms. However, the relatively smaller size of the firms could be because they are more recently founded. While the firms are

relatively smaller in terms of employment, they are more productive in terms of sales per employee: both Chinese and Indian firms have sales of \$270,000 per employee, compared to sales of \$240,000 per employee for all of the firms in our database.

Table 4

Sectoral Distribution of Silicon Valley High-technology Firms

| | <i>ALL FIRMS</i> | <i>CHINESE (%) FIRMS</i> | <i>INDIAN (%) FIRMS</i> |
|---|----------------------|------------------------------|-----------------------------|
| 35 - Industrial Machinery And Equipment | 1032 | 182 (17.6) | 42 (4.1) |
| 36 - Electronic and Other Electric Equipment | 986 | 201 (20.4) | 42 (4.3) |
| 38 - Instruments And Related Products | 263 | 29 (11.0) | 6 (2.3) |
| 50 - Wholesale Trade— Durable Goods | 1660 | 536 (32.3) | 81 (4.9) |
| 73 - Business Services | 2584 | 292 (11.3) | 208 (8.0) |
| 87 - Engineering and Management Services | 1244 | 110 (8.8) | 57 (4.6) |

Source: Dun & Bradstreet 1996.

Chinese-run firms tend to be concentrated in computer hardware related sectors, while Indians are disproportionately represented in software. The Chinese firms are most heavily concentrated in industrial machines, electronic equipment, and wholesale trade (primarily computers, peripherals, and software). By contrast, Indian firms are primarily found in the business services sector, and within that sector 50 percent of the firms are in the computer programming (software) sub-sector. This is likely due to the differences between the two groups in language skills. While Indians tend to be proficient in the English language, most Chinese immigrants are not — hence they gravitate towards sectors where language skills are less important.

Having documented the important and growing presence of highly-skilled Indian and Chinese immigrants in the Silicon Valley workforce, this article now turns to an analysis of the formal and informal networks which bind them together.

The New Immigrant Networks

In April 1997, the Monte Jade Science and Technology Association held its annual meeting in Silicon Valley. There were over 1,000 attendees at this meeting of Chinese high-technology executives, which meant that there was standing room only in the Santa Clara Convention Center. The language spoken at the meeting was English (for the first time), but virtually all of the audience was of Chinese descent. The speakers at the meeting were leading executives in the semiconductor industry who had flown in from Taiwan, China, Singapore, and South Korea.

The next month, Silicon Valley's Indian technology community gathered at the Annual Meeting of The Indus Entrepreneur (TiE). While it was not quite as big a meeting (there were approximately 800 attendees), the TiE conference (TiECon) offered two days of detailed presentations about the nuts and bolts of starting a business, raising capital, going public, etc. This provided the equivalent of a mini-MBA as well as well as ample opportunities for socializing and networking among an almost exclusively South Asian audience.

These two examples illustrate how Silicon Valley's new immigrants have created tight and supportive ethnic networks. These local networks are comparable in many ways to those found in traditional ethnic communities, but they also offer critical connections to distant markets and suppliers in Asia. Apart from the individual technical skills and expertise that the Chinese and Indian engineers possess, they also draw on resources generated by associational activities that result from, and in turn reinforce, their ethnic identities. As Waldinger et al. (1990: 34) note, ethnicity itself can be predicated upon social interaction and connection: "Ethnicity is acquired when the social connections among ethnic group members help establish distinct occupational, industrial, or spatial concentrations. Once established, these concentrations promote frequent and intensive face-to-face interactions that breed a sense of

commonality and identification with members of the same ethnic group.”

The following section describes the activities of the two leading associations of Silicon Valley’s Chinese and Indian technologists. It should be noted that there are over 20 other professional and technology related organizations among the region’s Chinese community and a smaller number of organizations in the Indian community. Our interviews have confirmed that these organizations offer their members opportunities for the sorts of networking and interactive exchange that build shared ethnic identities and interests among groups with common languages, cultures and professional experiences. They also help to create important job search networks and foster cross-generational investment and informal mentoring within the ethnic communities. Not surprisingly, while the Chinese and Indian networks are each quite robust and while Chinese and Indian engineers work together in most Silicon Valley firms, the professional and social networks of these two ethnic groups remain almost entirely separate.

*The Indus Entrepreneur (TiE)*¹²

TiE was started in Silicon Valley in 1992 by successful entrepreneurs, corporate executives, and senior professionals of Indian descent, with the explicit goal of fostering entrepreneurship by providing mentorship and resources to a younger generation of South Asians. The organization has three primary objectives: 1) To foster entrepreneurship and to nurture entrepreneurs; 2) To network and to facilitate networking among members; 3) To help membership integrate with the mainstream community. TiE currently has about 560 members in the Bay Area and has established branches in Southern California, Boston, and Austin.

The organization’s activities include monthly meetings, an annual conference, and other informal mentoring and networking activities. The main event is a two-day annual conference called TiEcon that brings together a large number of Silicon Valley’s key players around a theme related to entrepreneurship. Other activities include monthly networking meetings which allow attendees to introduce themselves and meet fellow entrepreneurs and professionals. Some of these meetings also feature invited speakers — generally successful

entrepreneurs — to talk about their experiences. Occasionally, TiE also organizes a company forum where entrepreneurial executives present their company, its achievements, and challenges; an expert panel asks questions and provides feedback, and the audience also participates. This interactive forum creates a setting for understanding the strategic and tactical aspects of starting and growing firms. Apart from these formal activities, there are a host of informal activities for mentoring and helping entrepreneurs.

TiE has also continued to expand its connections back to India by formalizing ties with the Indian government officials responsible for the development of high-technology sectors in India. By establishing such ties, TiE hopes to make the Indian government more responsive to the needs of companies in the U.S. that want to establish branches in India. When a delegation of government officials, representatives of industry associations and industrialists from India recently visited the U.S. to attract foreign investment, one evening was devoted exclusively to discussions with TiE members on facilitating business ties between Silicon Valley and India.

Monte Jade Science and Technology Association¹³

The Monte Jade Science and Technology Association was formed in Silicon Valley in 1990 by a group of successful Taiwanese entrepreneurs and executives with the mission of promoting business cooperation and long term investment between Taiwan and the Bay Area. The Association's explicit aim is creating social and technical opportunities for professionals and corporations located on both sides of the Pacific to share their valuable experiences in research, investment, and business. Almost all of the association's meetings are conducted in Chinese (Mandarin). Although firms run by non-Chinese are allowed to become members of the association, corporate members must be represented by Mandarin-speaking individuals of managerial level or above in order to facilitate communication within the association. Monte Jade currently has 200 corporate and 300 individual members in Silicon Valley. It has six regional branches in the rest of the U.S., and new branches in Europe and Taiwan are in the planning stages.

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The association's activities include: 1) an annual meeting for members that consists of a topical discussion about some aspect of the high-technology industry, including a keynote speech by a distinguished guest speaker; 2) monthly dinner meetings to promote networking among members; 3) special seminars in collaboration with other professional organizations to discuss technical and organizational issues pertinent to high-technology business; 4) social events for members and their families; and 5) annual meetings for recognizing outstanding corporate and individual members.

Monte Jade's role as a bridge between the technology communities in Silicon Valley and Taiwan has grown rapidly, especially as a growing number of U.S.-educated Taiwanese engineers have chosen to return to Taiwan to work, taking with them not just technology but also skills, contacts, and organizational models. Over 200 Silicon Valley "returnees" have started companies in the Hsinchu Science-Based Industrial Park outside of Taipei -- and copies of the Monte Jade monthly newsletter are easily available in Hsinchu. Most recently, Monte Jade has begun to sponsor an annual Investment Conference that brings together venture capitalists from both Silicon Valley and Taiwan to share information, meet entrepreneurs, and evaluate potential investment opportunities. At the 1997 conference, 23 of the 25 companies presenting their business plans were Chinese. Thus Monte Jade is increasingly promoting the flow of capital as well as skills and know-how across the Pacific.

Implications for Policy

Silicon Valley's importance to policymakers transcends its role as one of the leading industrial regions in California. The region offers insights into the policy prerequisites for sustained economic vitality in an era of increasingly international flows of labor, capital, and technology. Silicon Valley businesses have successfully exploited the attributes that distinguish the California economy in the 1990s, particularly the ability to attract and train a skilled immigrant workforce and the state's geographic proximity to rapidly growing Asian economies. This study of immigrant entrepreneurs in Silicon Valley demonstrates how Chinese and Indian immigrants have escaped economic marginality to successfully compete in the region's technologically fast-paced, globally competitive industries. Moreover, it suggests public policy measures that could

enhance the contribution of this dynamic model of immigrant entrepreneurship to Silicon Valley, as well as supporting its diffusion to other regions in California.

Potentially promising arenas for public intervention to support immigrant entrepreneurs include education policy and the promotion of foreign investment and exports. For example, the presence of large numbers of Asians professionals in the Silicon Valley workforce appears to be linked to the openness of the region's educational institutions. Public universities in the San Francisco Bay Area grant far more engineering degrees to Asian-Americans than public universities elsewhere in the nation or local private universities. In 1990, more than 45 percent of the electrical engineering degrees granted by the University of California at Berkeley, San Francisco State University, and San Jose State University went to Asian-Americans, compared to under 20 percent at other top-ten electrical engineering departments such as Cornell, Illinois, Michigan, Princeton, MIT, and Stanford (Park 1992). While the data do not define what percentage of these graduates are foreign-born, they suggest that Silicon Valley firms have benefited from the openness of the state's public educational institutions to recent immigrant groups.

The Silicon Valley experience also suggests that policies encouraging the investment of overseas capital in immigrant enterprises can significantly enhance their competitive position. In 1987, California was home to 40 percent of the nation's Asian-owned firms, while it had only 11 percent of the nation's population. However many of these firms were small and undercapitalized (Louie and Ong 1995). It appears that Silicon Valley's immigrant entrepreneurs, by contrast, benefit from extensive foreign investment. While hard data are difficult to come by, it is clear that significant amounts of Taiwanese capital is being invested in the region's ethnic Chinese start-ups through formal banks and venture capital firms as well as through informal social networks. This suggests that policymakers might develop mechanisms to encourage the expansion and formalization of such foreign investment, especially from Asia, in other industries and regions of California.

Finally, public policies that support the efforts of entrepreneurial firms to initiate or expand exports could similarly contribute to the upgrading of immigrant-owned enterprises in

California. In 1995, for example, Silicon Valley accounted for more than \$27 billion in exports, or 34 percent of California's total exports, with only 10 percent of the state's population. A substantial share of these exports were destined for Asian markets -- in part due to the privileged access provided by Chinese and Indian engineers who possess the linguistic and cultural ties needed to penetrate foreign markets. Policies which support the efforts of entrepreneurial firms to initiate or expand exports could thus be beneficial to other sectors or regions in California, especially where there are immigrant firms that might exploit their privileged connections to Asian markets.

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² In this research, Silicon Valley refers to the region that includes the following: all of Santa Clara County, and parts of Alameda County (Fremont, Union City, Newark), San Mateo County (Menlo Park, Atherton, Redwood City, San Carlos, Belmont, San Mateo, Foster City and East Palo Alto) and Santa Cruz County (Scotts Valley). For analyses of employment, we used PUMS data for the entire San Francisco Bay Area and extracted persons working in the Silicon Valley region. The Standard Industrial Classification (SIC) codes used to define "high-technology industries" are: 355, 356, 3571-7, 358, 359, 361, 362, 364-7, 369, 381, 382, 504, 506, 737, 871 and 873.

³ For an early history of Chinese immigration see Sung (1967), and for Indian immigration see Hess (1982).

⁴ For example, the Chinese Exclusion Act of 1882, the Alien Contract Labor Law of 1885, the Immigration Act of 1917 and the Immigration Act of 1924.

⁵ Asians are comprised of Asian Indians, Chinese, Filipinos, Japanese, Koreans, Vietnamese and Other Asians.

⁶ The use of the term Chinese masks the fact that during the 1970s and 1980s the majority of these immigrants were from Taiwan. This balance appears to have changed significantly during the 1990s.

⁷ Note that while these figures are for the population in the Silicon Valley region, they do not refer to (im)migration directly into the region, because the (im)migrants may have immigrated to other areas of the U.S. and then migrated to Silicon Valley. Nationwide, according to the *1990 Census of the Population - Foreign Born Population in the U.S.*, there were 1,645,472 ethnic Chinese out of whom 921,070 (56 percent) were foreign born, and 815,447 ethnic Indians, out of whom 450,406 (55 percent) were foreign born.

⁸ The general population refers to adults 16 years or older, including those that are non-working. The total sample size of the general population is 89,198 persons out of which there are 12,844 (14.4 percent) high-tech workers.

⁹ The occupational categories used for this analysis include: managers, professionals, technicians, semi-skilled (operators), and administrative (administrative, sales and service staff).

¹⁰ These data were obtained from the CorpTech dataset by identifying Chinese and Indian names from a list of executives of 1938 major high-tech companies in Silicon Valley. Note that executives can have multiple roles within a firm, e.g., the head of sales can also be the head of marketing.

¹¹ The list of Chinese and Indian firms was compiled by identifying the name of the CEO as being Chinese or Indian.

¹² Further information about TiE's activities may be obtained from www.tie.org.

¹³ Further information about Monte Jade's activities may be obtained from www.mtjade.org.

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