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# ECONOMIC GLOBALIZATION AND IT TALENT FLOWS ACROSS THE TAIWAN STRAIT

## *The Taipei/Shanghai/Silicon Valley Triangle*

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Tse-Kang Leng

### Introduction

Exchange of human capital is the most intimate form of international commerce, and, despite political differences, economic globalization has added this dimension to cross-Taiwan Strait relations. In the past few years, hundreds of thousands of Taiwanese advanced personnel have accepted working assignments in China, and Taiwan is beginning to permit Chinese technological talent to enter its labor force. The bilateral exchange is intimately related to common experiences of ethnic Chinese talent in American universities and high technology companies. Moreover, the venture capital (VC) funding new high-tech enterprises is heavily influenced by ethnic

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Chinese connections in the China-Taiwan-U.S. triangle. While the interdependence and uncertainties occasioned by human capital and entrepreneurial links may be an unwelcome concern to governments, policies that would reverse the phenomenon are likely to be self-destructive because of reaction from the business community.

This article discusses the causes and process of the mobility of advanced talent between Taiwan and China, as well as its impact on cross-Taiwan Strait relations. Economic globalization, demonstrated by new waves of Taiwanese investment and the formation of global Information Technology (IT) production networks with the U.S., is the major impetus behind talent flows between Taiwan and China. This article argues that cross-Strait talent interaction is boosted by Taiwanese investment in China's metropolitan areas such as Shanghai and by financial instruments such as VC. In addition, this article demonstrates that human capital flows across the Taiwan Strait are facilitated by the networking of production through international channels, especially through high-tech centers located in the U.S. This case study also analyzes the motivations and limitations of state efforts to intervene in cross-Strait talent interaction. Due to many non-economic concerns such as national security, Taiwan's policies to attract advanced talent from China are more cautious. The Taiwanese state tries to limit capital and personnel outflows to China but falls short of operational instruments in the era of economic globalization. Facing the multiple challenges of promoting international competitiveness, reconstructing the global networking of production, and attracting top talent around the world, the state is compelled to readjust its role and adopt the strategy of selective intervention and selective withdrawal in the era of globalization.<sup>1</sup>

## Talent Flows Driven by Globalized Market Forces

The recent outflow fever of Taiwan's advanced labor forces is driven by an emerging new type of cross-Strait economic interaction. According to a survey conducted by a Taiwanese human resources company investigating the advanced labor forces in February 2001, 64% of respondents expressed interest in working in China; among these, 55% wished to work in a Taiwanese

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1. For more complete discussions on the transformation of state sovereignty and institutions in the era of globalization, see Stephen D. Krasner, "Sovereignty," *Foreign Policy*, 122 (January/February 2001), pp. 20–29; Stephen D. Krasner, *Sovereignty: Organized Hypocrisy* (Princeton: Princeton University Press, 1999); Miles Kahler, "Information Networks and Global Politics," in Christoph Engel and Kenneth Keller, eds., *Understanding the Impact of Global Networks on Local Social, Political, and Cultural Values* (Baden-Baden, Germany: Nomos, 2000); Warren Magnussen, *The Search for Political Space: Globalization, Social Movement, and the Urban Political Experiences* (Toronto: University of Toronto Press, 1996).

company, while 36% preferred American companies. As to site preference, 43% chose Shanghai.<sup>2</sup>

### *Economic Division of Labor and Talent Flows*

This new wave of “mainland fever” is different from the early stage of Taiwanese investment in China. Most Taiwanese merchant “pioneers” in the late 1980s and early 1990s were owners of small enterprises from Taiwan’s suburban and rural areas. They set up export-processing factories in China’s special economic zones such as Shenzhen and Xiamen and other coastal areas. Such labor-intensive Taiwanese firms create job opportunities for the host country but provide little incentive for Taiwanese managers to stay permanently in China. Normally, these Taiwanese managers go to China without bringing their families. They soon become “air men,” flying back and forth between Taiwan and China through Hong Kong and Macao.<sup>3</sup> These Taiwanese firms do not have long-term plans for their managers to reside in China, and thus do not create a problem of talent outflow.

This strike-and-run type of business operation is changing. The change of business patterns indirectly leads to a change in advanced human resource distribution between Taiwan and China. New Taiwanese business people have long-term plans and the teamwork capacity to expand their business in China. Two factors contribute to the change. First, as China gradually opened its domestic market, Taiwanese firms began to move northward from Guangdong and Fujian Provinces to other major urban areas in order to obtain access to domestic markets, especially the Yangtze Delta area. Facing keen competition from China’s indigenous firms and multinational corporations in big cities, Taiwanese business people have no choice but to develop long-term strategies to survive in the urban environment. In order to survive and expand, Taiwanese firms in the urban centers or suburban areas of big cities, such as the greater Shanghai region, have to play by the rules of the game and follow the legal framework of business operations. Only the “big boys” can play the urban game of business competition in China.

Moreover, as the profits of labor-intensive industries in big cities become slim, major Taiwanese firms in the urban areas of China are concentrating on capital-intensive and technology-oriented enterprises. In order to build up a new economic kingdom that embraces current trends in technology development, attracting advanced talent—rather than cheap labor—has become the first priority. Firms with long-term vision normally have grand plans to cre-

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2. For a detailed poll report, please refer to <<http://www.104poll.com.tw/Columan/Columan.asp>>.

3. At the current stage, direct transportation routes between Taiwan and China are not allowed. Normally, Taiwanese passengers must go through Hong Kong or Macao to enter China.

ate a global division of labor and to integrate the human resources of both sides of the Taiwan Strait. These established firms are attracting young Taiwanese engineers, as well as legal and business professionals in the service sectors, to explore the virgin territory of high-tech development in China.

As Taiwanese investments enter a new era of competition, exploring advanced human resources becomes the key for success. High salaries are no longer the only factor in attracting Taiwanese employees. With the help of the local governments in China, Taiwanese high-tech firms in China are now going further to provide necessary living amenities for employee families, such as quality elementary and high school education equivalent to Taiwanese or even international standards. From some perspectives, new Taiwanese employees in big cities such as Shanghai are no longer "air men." They move their whole families to Chinese cities and gradually form Taiwanese communities in suburban areas. Taiwanese business communities are also setting up Taiwanese-style schools to solve the problem of educating young Taiwanese children. Recently, the Taiwanese government formally recognized diplomas from Taiwanese elementary and high schools in China.

In addition, intermarriage between Taiwanese and mainland Chinese is becoming more common than before. With family ties and stability, many Taiwanese are growing their own roots in China, becoming known as Taiwanese immigrants, instead of Taiwanese businessmen or businesswomen in China. According to unofficial estimates, the number of Taiwanese in the greater Shanghai area has reached 300,000. In order to adapt to the mainland environment, members of the Taiwanese community in Shanghai have gradually shifted their identity to the new land, while struggling to somehow keep their Taiwanese characteristics. For example, in order to be integrated into the local community, some Taiwanese families begin to send their children to local instead of international or Taiwanese-run schools in Shanghai. During the summer break, these children go back to Taiwan to refresh their historical or cultural lessons at summer camp. Although politically the new Taiwanese community dislikes the communist regime, they identify "China" by its historical, cultural, and economic connotations.<sup>4</sup>

The long-term strategy of Taiwanese firms is demonstrated by the fact that the Chinese market has become a training field for breeding second-generation entrepreneurs. A common practice for Taiwanese big enterprises is to urge the second generation to stay in China to manage the family business. Sometimes the first-generation entrepreneurs let their elder sons succeed them in running their business in Taiwan, while assigning younger children

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4. These views were gleaned from the author's interviews and homestays with Taiwanese managers and their families in Shanghai from February 13 to 26, 2001.

to China to gain practical experience.<sup>5</sup> Different from the small-business owners during the early stage of Taiwanese investment, these Young Turks are well educated and equipped with solid capital and management skills. In order to utilize China as the power base for the family business, they begin to build up a web of *guanxi* (reciprocal) business connections, especially with China's young capitalists and the offspring of high-ranking officials. Some second- or third-generation Taiwanese entrepreneurs even enter China's prestigious business schools—such as those at Tsinghua (Qinghua) and Fudan Universities—to pursue higher degrees. As a result, a close schoolmate-based networking web between China and Taiwan's young business bloods is being established.

Taiwanese technology-oriented firms also play a role in integrating young Taiwanese and mainland Chinese talent. Semiconductor Manufacturing International (SMI, or Zhongxin), a newly established US\$1.46 billion Taiwanese semiconductor company located in Shanghai's Zhangjiang High-Tech Park, is a good example. In addition to attracting talent from leading Taiwanese semiconductor firms such as Taiwan Semiconductor Manufacturing Corp. (TSMC) and United Microelectronics Corp. (UMC), SMI's major human resources come from overseas Chinese and returning mainland Chinese students trained abroad. According to Zhang Rujing, CEO of SMI, the firm's major recruitment target is returning Chinese students with graduate degrees. Zhang indicates that many mid-ranking Chinese managers formerly working at American companies have expressed their intention to join SMI at half their U.S. salary.<sup>6</sup> In 2000, China's own universities also produced 50,000 to 60,000 graduates with master's or doctoral degrees in engineering. This huge pool of brainpower is potentially the most important source of SMI's human resources. This case provides a sharp contrast with labor-intensive Taiwanese factories that hire cheap labor from China's remote countryside. Since SMI is registered as an American company, many Taiwanese regulations governing cross-Strait investment are not applicable. This new semiconductor powerhouse has, from many perspectives, become an integrator to link international talent with that from Greater China.<sup>7</sup> The role of Taiwanese technology-oriented firms has been transformed from cheap-labor exploiter to high-tech broker and mediator. These firms also serve as a bridge to link global Chinese manpower to the huge Chinese market.

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5. Interview with Shiu-Mei Lee, director, Public Relations Department, Delta Corporation, February 14, 2001, Shanghai, China.

6. *Digitimes*, December 6, 2000, <http://www.tw.biz.com/fnews/001206/industry/digitimes/5c6c2txt.html>.

7. "Greater China" as used here includes Mainland China, Taiwan, and the Hong Kong and Macao areas. For a conceptual analysis of Greater China, please refer to David Shambaugh, ed., *Greater China: The Next Superpower?* (Oxford: Oxford University Press, 1995).

*Taiwanese Investment and Cross-Strait Brain Drain*

The Taiwanese state is keeping alert to the possible brain drain to China, but market forces have also created mechanisms of brainpower cooperation in the era of globalization. The new wave of cross-Strait talent movement, promoted by Taiwanese investment in the high-tech sector in China, does not mean an overwhelming brain drain out of Taiwan. It does not imply that China's major cities will become the bases for the global Chinese high-tech elite in the short term. In some respects, the roles of advanced human resources on both sides of the Taiwan Strait are mutual and complementary. The potential for future brain drain can be analyzed from the following perspectives.

First, supplies of engineers constitute only one of many important factors for the success of technology-oriented industries. Cultural factors such as a willingness to share, tolerance of failure, and devotion to diversity are key qualities for establishing businesses of innovation. Moreover, there exists a gap between scientific knowledge and marketable technologies in China. People tend to focus their attention on the huge brainpower resources in China's engineering fields, but at the same time, a lack of marketable capabilities and management skills are major weaknesses for China's technology development. Taiwan's manpower advantages in marketing, financing, and legal services help it to occupy a strategic position. From this perspective, Taiwan and China could develop a mutually complementary—instead of competitive—relationship with manpower interaction in the technology-oriented sector. Taiwan could also play the role of knowledge broker, applying the capitalist spirit “with Chinese (or Taiwanese) characteristics,” as the slogan goes, to the mainland market.

Second, the real brain drain is not occurring between Taiwan and China, but between the Greater China area and the U.S. This drain is the result of the rational choices of talented individuals. The states on both sides of Taiwan Strait have limited instruments to regulate this talent flow. As long as Silicon Valley, the high-tech capital of the world, continues to experience shortages in IT talent, this huge magnet will attract Chinese talent from both sides of the strait. Work experience in Chinese, Taiwanese, or foreign firms provides a good springboard from which Chinese engineers can leap to their ideal work destinations. The springboard effect brings bright students and practitioners from both sides of the Taiwan Strait to the U.S., and thus integrates Chinese talent outside the motherland.

Third, although Taiwanese high-tech firms in China stress their efforts to attract returning Chinese talent from abroad, claims to success are still premature. Some overseas students have come back to China, and the number is increasing. Statistics compiled by the Chinese government show that the number of returned students rocketed to nearly 7,400 in 1998, up from about

1,600 in 1990. According to an estimate of one foreign enterprise in China, about a quarter of the more than 200,000 students who went abroad after 1978 have now returned.<sup>8</sup> The Taiwan experience indicates that once domestic social and economic standards in China reach a certain level, a reverse brain drain will occur. However, most of the advanced Chinese talent overseas will not consider returning until they obtain permanent residence or citizenship status in foreign nations. Similarly, Taiwanese technology entrepreneurs working in China usually obtain residence status from other countries, as insurance against a political catastrophe. Currently, many high-ranking mainland Chinese and Taiwanese managers working in technology firms in China are counted as foreigners from a legal perspective. In the era of globalization, multiple identities or the new identity of global citizen may be developing among the ethnic Chinese technology elite. Given the fact that state sovereignty does not mean absolute control of these elites, the conventional concerns over a two-way brain drain, and its impact on national security, have begun to face strong challenges.

Last but not least, overemphasizing the plentiful supply of Chinese technology talent is a fallacy. As Gong Ke, vice president for research and industrial relationship at China's prestigious Tsinghua University, has indicated, the problem of China's high-tech human resources is not one of quantity. The major problem is their quality. University training has become too specialized and students do not receive a broad-based education.<sup>9</sup> In Taiwan, regardless of the economic stagnation, major corporations in the IT industry still have a shortage of advanced IT talent. New Taiwanese IT factories in China also attract Taiwanese engineers. The tug-of-war between Taiwan and China now more or less focuses on consolidating human resources.

In reality, attracting the best talent is a global agenda. Most Asian nations are facing the same problem of a shortage of advanced IT labor. Singapore, for example, has taken initiatives to promote free movement of advanced labor forces across its border. The country faces a looming skills shortage and has forecast the need for 10,000 additional IT workers each year. Recognizing that talent is a passport that is nationality-blind, Singapore has taken the first step to set up an "electronic passport" system with Malaysia to make moving between the two countries much easier.<sup>10</sup>

The preceding discussion demonstrates that in analyzing advanced talent flows between Taiwan and China, two important factors must be taken into account. First, because market globalization is the major force promoting

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8. See Kathy Wilhelm and Dan Biers, "No Place Like Home," *Far Eastern Economic Review* 163:24 (June 15, 2000), p. 73.

9. Doug Nairne, "Asia Faces Shortage of Skilled IT Workers," *South China Morning Post*, March 26, 2001.

10. *Ibid.*, March 12, 2001.



talent flows, attracting the best ethnic Chinese talent around the world has become a main task for the states of both sides of the Taiwan Strait to undertake. Both have limited capacities to regulate cross-border flows of talent holding multiple citizenships, but in both China and Taiwan, the state can play a key role in providing institutional and infrastructure support to win this new tug-of-war. From this perspective, the power of the state does not shrink but is transformed. Major cities will be the main sites of this manpower cooperation and competition. As Ferdinand Tönnies pointed out more than a century ago, big cities exist in a global market culture regardless of where they are located.<sup>11</sup> Saskia Sassen also indicates that overlooking the spatial dimension of economic globalization and overemphasizing the information dimensions have both served to distort the role played by major cities in the current phase of economic globalization.<sup>12</sup> Second, in the era of globalization, advanced talent rationally choose the best place to render service. High-tech centers in the U.S., especially in the Silicon Valley area, are already providing crucial venues to promote ethnic Chinese talent interaction. Silicon Valley provides global network connections to link technology, research and development (R&D), and capital. The integrative functions of this high-tech center away from Chinese soil need further discussion.

## Global Networking and Talent Connections

The strength of Taiwanese high-tech production capacity is its connection with global technology centers. The close connection between Taiwan's high-tech center—Hsinchu Science-Based Industrial Park (HSBIP)—and Silicon Valley in the U.S. enhances the productivity and performance of both places.

### *The Emergence of Trans-Pacific Linkages of Ethnic Chinese Talents*

The key actors enhancing this connection are a transnational community of U.S.-educated Taiwanese engineers who have the language skills and experience to operate smoothly in both regions. Their dense social and professional networks foster two-way flows of technology, capital, know-how, and information between the U.S. and Taiwan, supporting entrepreneurship in both regions while also providing the foundation for formal interregional business relations such as consortia, joint ventures, and partnerships. This delicate

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11. Ferdinand Tönnies, *Gemeinschaft und Gesellschaft* [Community and society], 7th edn. (Berlin: Verlag Carl Curtius, 1926; first edn. 1877), pp. 53–55, 242–43.

12. Saskia Sassen, *Cities in World Economy* (Thousand Oaks, Calif.: Pine Forge Press, 2000), p. 2.

“guanxi capitalism,” as Saxenian and Hsu put it, is difficult to imitate for even the most flexible and decentralized multinational corporations.<sup>13</sup> The success of Taiwan in the high-tech sector is characterized by its capacity to integrate leading-edge technologies overseas into marketable products. Taiwan’s U.S.-trained human talent is the key to helping the state embrace global trends in the high-tech industry.

The success story of HSBIP provides a model for China’s high-tech development. Major Chinese high-tech centers, such as Beijing’s Zhongguancun and Shanghai’s Zhangjiang, are initiating new policies to attract international IT talent and returning students. At present the linkage between China and Silicon Valley is still in the initial stage. However, given the fact that the number of advanced foreign workers and returning students is increasing, a prototype of HSBIP-style networking connection is emerging. Different from the early HSBIP experience some 20 years ago, the Beijing/Shanghai connection with Silicon Valley involves the Taiwan factor to facilitate the formation of networking. The Taiwanese technology elite in Silicon Valley serve as brokers to fabricate this new networking across the Pacific Ocean. The globalized IT industry has expanded the talent flows between Taiwan and China into the international arena.

Regardless of political differences, overseas Taiwanese entrepreneurs are helping to introduce the Silicon Valley model to China. Mutual economic benefit, rather than political interest, motivates this move. Numerous ethnic Chinese technology associations in the Silicon Valley region serve as a bridge to link technology and talent between the U.S. and the Greater China area.<sup>14</sup> The alliance between an association, National Business Information (NBI), and the municipal government of the commercial center Ningbo, in Zhejiang Province in eastern China, is a typical case. In 2000, NBI, an association of Chinese-American computer companies of which Taiwanese firms constitute the majority, helped establish a cooperative relationship with industrial-park developers in Ningbo. Member firms of NBI set up a software-development base and other joint ventures in Ningbo. NBI leaders stress that the strength of NBI is its dense network of people in the three largest growth markets in the world, namely, China, Taiwan, and Silicon Valley.<sup>15</sup>

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13. Jinn-Yuh Hsu and AnnaLee Saxenian, “The Limits of Guanxi Capitalism: Transnational Collaboration between Taiwan and the U.S.A.,” *Environment and Planning* 32:11 (November 2000), p. 1994.

14. For the role of Chinese technology associations in the Silicon Valley region, see AnnaLee Saxenian, “Networks of Immigrant Entrepreneurs,” in Chong-Moon Lee, William Miller, Marguerite Hancock, and Henry Rowen, eds., *The Silicon Valley Edge* (Stanford: Stanford University Press, 2000), pp. 248–76; Deng Hai-zhu, *Xigu Chuanqi* [Legend of Silicon Valley] (Taipei: Yuanshen Press, 1998), p. 998.

15. *Nikkei Weekly*, Tokyo, November 27, 2000.

Another case of trans-Pacific technological interaction promoted by ethnic Chinese high-tech associations is the recent activity of the Chinese American Semiconductor Professional Association (CASPA). CASPA is one of the largest Chinese American semiconductor professional organizations outside China and Taiwan. It was founded in 1991 and now has more than 1,000 registered members. Most of these work at Silicon Valley's major semiconductor companies and are senior professionals. CASPA also has 60 corporate members in the U.S., Taiwan, China, and Singapore.<sup>16</sup> In July 2000, under the sponsorship of the Consulate General of the People's Republic of China (PRC) in San Francisco, and hosted by the Shanghai Municipal Government, CASPA members made a historic trip to Shanghai. Led by key Taiwanese senior engineers from major IT companies such as Integrated Circuit Technology (ICT), Aurora System, Nippon Electric Company (NEC), Lattice Semiconductor, and Clarent, CASPA introduced examples of Silicon Valley's technology know-how (such as integrated circuit design and high-density television) and management knowledge (such as marketing and VC) to the Chinese audience in Shanghai. Managers, engineers, and governmental officials from Shanghai and adjacent cities approached the CASPA group to seek professional advice and business opportunities. After the Shanghai visit, the CASPA delegation went to Taiwan and rendered advice about cross-Strait IT cooperation. CASPA suggested that the best policy for Taiwan, to enter the China market at the current stage, is to create strategic alliances with major international semiconductor producers. Members of CASPA indicated that Taiwan, well equipped with capital and production capacity, could play the role of mediator to introduce international talent to China and to integrate human resources of the Greater China region with global high-tech centers.<sup>17</sup>

The above cases demonstrate that political tension is no longer a key factor impeding cooperation among ethnic Chinese talent. Although key members of NBI and CASPA are senior Taiwanese engineers, their long-term visions have expanded from the Taiwan-Silicon Valley connection to trans-Pacific interactions with Greater China. Market benefits now play the major role, and the advanced manpower of the Chinese high-tech network facilitates the emergence of an ethnic Chinese technology circle. However, the relationships among government-affiliated technology associations from both sides of Taiwan Strait in Silicon Valley may include both competition and cooperation. The Hua-Yuan Science and Technology Association, supported by the PRC government, was established in Silicon Valley in 2001. Hua-Yuan's goal is to promote a high-tech development model of "designed in Silicon

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16. For detailed information about CASPA, please refer to <<http://www.caspa.com>>.

17. Interview with Dr. Yun-Parn Lee of International Division, CASPA, on May 7, 2001, Santa Clara, Calif. Dr. Lee, project leader of NEC Electronics, was one of the representatives on CASPA's 2000 trip to Shanghai.

Valley, manufactured in China.” The emergence of Hua-Yuan aroused the attention of Monte Jade Science and Technology Association, a Taiwanese government-supported association established in 1990. In recent years, one of Monte Jade’s major goals has become to develop the Chinese market by introducing U.S. technologies and Taiwanese capital. However, Monte Jade’s previous plan to establish chapters in China was blocked by Beijing.<sup>18</sup> Many Taiwanese venture capitalists and start-up firms in Silicon Valley are trying to develop connections with both Hua-Yuan and Monte Jade. Future interaction between these two associations may include developing alliances to integrate ethnic Chinese talent or competing for the dominant role to attract Chinese brainpower and capital in Silicon Valley.

*Venture Capital as the Catalyst of Deep Talent  
and Economic Integration*

In building the Taiwan-China-U.S. talent network, venture capitalists serve as a dynamic vehicle to smooth the process of invisible integration. In the United States, start-up firms run by ethnic Chinese normally have difficulties getting funds from U.S. VC companies. One crucial source for these ethnic Chinese start-ups seeking funding, regardless of whether the firms are run by Chinese graduates or Taiwanese graduates, is active Taiwanese VC. It is reported that investment in the U.S. by Taiwanese VC firms grew from U.S. \$130 million in 1998 to U.S. \$400 million in 1999, most of which is estimated to have gone to ethnic Chinese-owned businesses in Silicon Valley.<sup>19</sup> These Taiwanese venture capitalists are normally regarded as “deal makers,” connecting Taiwanese and U.S. IT industries. While investing in design-oriented start-ups in Silicon Valley, Taiwanese venture capitalists also are introducing these design houses to Taiwanese IT production companies, and thus establishing a design-production network across the Pacific Ocean. Taiwan’s high-quality production capacity and the innovative spirit in Silicon Valley are connected, and their connection smoothed, by the venture capitalists.

In addition, more Taiwanese capitalists are also becoming “kingmakers” in Silicon Valley. These venture capitalists establish incubators there as one key base for investing in high-tech start-ups. Typically, founders of Taiwanese incubators themselves are successful entrepreneurs and have practical experience in establishing high-tech firms in the U.S. Taiwanese-run incubators also become centers for fostering young ethnic Chinese entrepreneurs in Silicon Valley. Acorn Campus, established by Chen Wu-fu and four other Taiwanese engineers-turned-entrepreneurs, is a case of a successful business incubator in Silicon Valley. Acorn has plans to introduce the Acorn

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18. *Jingji Ribao* [Economic Daily], Taipei, May 24, 2001, p. 8.

19. *Ibid.*, May 24, 2001, p. 8.

model and establish start-up incubators in Shanghai in the near future. Chen himself plans to lead a new team in Shanghai. As Chen indicated, Acorn's focus is on China's advanced talent, rather than China's market.<sup>20</sup>

The case of Acorn Campus provides a potential model of trilateral cooperation among talent from Taiwan, China, and the U.S. A cross-border iron triangle of Taiwanese capital, Silicon Valley-style innovative spirit, and the ethnic Chinese advanced work force is emerging. Within this iron triangle, ethnic Chinese talent is the core. The U.S. provides ideal ground for innovative training for Chinese talent from both sides of the Taiwan Strait. The U.S. experience enhances understanding by these people of cutting-edge technologies and, more important, the confidence to start up their own businesses back on domestic soil.<sup>21</sup> These U.S.-trained advanced work forces therefore become a catalyst for manpower integration across the Taiwan Strait. Instead of bilateral interaction, this integrative mechanism is globally oriented.

In order to strengthen this iron triangle, Taiwanese VC adds fuel to boost development. Taiwanese professional managers become a crucial pillar to develop the Chinese market for international VC firms. The common practice of these firms is to register as an American or Hong Kong VC company and attract capital from the Greater China region and international sources. Take WI Harper (in Chinese, Zhong Jing He) for example. Registered as an American VC company, WI Harper wishes to attract US\$19 million to \$30 million in funding from Taiwan to invest in biotech industry. WI Harper plans to invest 20% of its new funds in Taiwan, 30% in China, and 50% in the U.S.<sup>22</sup> Beginning in 1996, WI Harper and Silicon Valley entrepreneurs have invested in a state-supported telecommunications company, Navini Networks, to develop third-generation mobile telecommunications (3G) technologies in China. WI Harper, together with Tsinghua University and the Beijing city government, also created the Beijing Technology Development Fund (BTDF), the first state-supported overseas VC, to invest in start-up high-tech companies in northern China. Further plans include the establishment of start-up incubators with China's major universities. In 2001, WI Harper and the Suzhou and Shenzhen city governments collectively invested

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20. Zhuang Suyu, "Chen Wufu: Xigu zui youming de Huaren chuanye zhi shen" [Silicon Valley's god of Chinese venture capitalism Chen Wufu], in *Yuanjian* [Global Views Monthly], Taiwan, April 2001), p. 120.

21. Interview with Nan-lei Larry Wang, senior vice president, engineering, EIC Corp., Fremont, Calif., May 8, 2001.

22. *Gongshang Shibao* [Commercial Times], Taipei, February 14, 2001. For a detailed discussion of WI Harper's investment projects, please refer to Thomas Hellman, Sandro Cornella, Rengan Rajaratnam, William Shen, Suzanne Usiskin, and Mary Yang, *WI Harper International: A Bridge between Silicon Valley and Asia* (Stanford: Stanford Graduate School of Business Paper S-SM39, 1998).

\$60 million in 3G wireless and Thin Film Transistor and Liquid Crystal Display (TFT-LCD) industries in China.<sup>23</sup>

One common characteristic of Taiwanese VC companies is the globalization of funding and management. In many cases, capital from mainland Chinese sources constitutes half of the total. In the global visions of such VC firms, one criterion for selecting Taiwanese start-up investment projects is their potential to expand and prosper in China. At the same time, these Taiwanese VC firms have established branches in major Chinese cities and trained first-generation VC managers there. Furthermore, American venture capitalists are becoming bridges to link Taiwanese and Chinese companies. Warburg Pincus, an American VC company, has established strategic alliances with Taiwanese venture capitalists to develop the Chinese market. One crucial goal of Warburg Pincus is to help promote the cooperative mechanisms among high-tech firms across the Taiwan Strait.<sup>24</sup>

New investment initiatives by Taiwan's VC are opening the door for deeper integration across the Strait. Different from the manufacturing investment in the early stage of cross-Strait economic interaction, the real target of this wave of VC investment is focused on the new generation of advanced talent in both Taiwan and China. Taiwanese venture capitalists are investing in emerging Chinese entrepreneurship, rather than in the cheap labor force and land available in China. In 1999, VC contributed only 2% of the capital of Chinese start-up firms. The low marketability of Chinese patents is an indication of the distance between research and entrepreneurial activities.<sup>25</sup> In other words, a large gap exists between basic research capacities and marketable technology, and between start-up spirit and funding possibilities. Equipped with capital and professional management skills, Taiwanese venture capitalists foresee the great potential to spread the seeds of entrepreneurship on the domestic soil of Chinese culture.

Taiwanese VC investment could also closely link up with China's drives for globalization and capital-market reform. At the initial stage, China's VC companies are organized by local governments. These local VC companies lack professional personnel and marketing capacity. Recently, China has begun to acknowledge the importance of attracting foreign VC to link Chinese start-up companies with international talent, sales routes, and capital markets.<sup>26</sup> State-backed VC firms are being restructured like those in the West

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23. *Ctech Channels* (special IT column in *Zhongguo Shibao* [China Times]), Taipei, February 22, 2001, at <<http://news.chinatimes.com>>.

24. *Ibid.*, October 30, 2000.

25. Lin Wanrong, "Taiwanese Venture Capital in China," *Global Views Monthly*, Taipei, November 11, 2000, p. 194.

26. Li Kun, "Fengxian touzi ye xuyao liyong waizi" [Venture capital also needs foreign investment], *Renmin Ribao* [People's Daily], overseas edition, December 30, 2000.

in order to compete in the market. Shanghai Venture Capital Corporation (SVC), a Shanghai city-owned VC firm, enjoys considerable autonomy to operate according to market mechanisms. SVC is also establishing strategic links with other Chinese VC firms such as Shanghai New Margin Venture Capital, controlled by President Jiang Zemin's son, Jiang Mianheng. In order to introduce international management experience, SVC and the Singaporean government-supported Venture TDF Company in 2000 jointly established a \$50 million fund. In an attempt to tap a global network of contacts, the Shanghai government eventually agreed to let the Singaporeans control the fund.<sup>27</sup> If the trend of globalizing VC management continues, Taiwanese VC firms will have plenty of opportunities to become leaders in cutting-edge professionalism. The complex networking with local and international technology centers gives Taiwan a unique advantage to compete with other Asian nations in the VC market in China. Furthermore, allying with China's state-backed VC companies creates favorable conditions for integration with China's domestic networking operations.

### Challenges to the Iron Triangle of Talent Integration

The preceding analysis demonstrates that mobility of advanced talent is the focus of cross-Strait high-tech interaction. Both Taiwan and China are struggling to lure the best ethnic Chinese talent in order to cope with the high-tech talent shortage. As it stands now, the Taiwanese state will face more constraints if it maintains current policies that limit the quality and quantity of the free flow of Chinese talent. Another challenge for Taiwan in this tug-of-war is the potential decline of globally oriented, high-tech talent. Table 1 contrasts Chinese and Taiwanese students enrolled in U.S. universities during the past five years. While the number of students from China shows a constant growth rate, the number of students from Taiwan is decreasing. In the 1999–2000 academic year, China's 54,466 students made up 10.5% of all U.S. international enrollments, while Taiwanese students made up only 5.6%.

Due to the fact that the Taiwan-Silicon Valley connection is created and promoted by returned Taiwanese students trained in the U.S., the decrease in numbers of Taiwanese students in the U.S. may threaten to weaken the foundation of this high-tech networking. While it has slowed in the past two years, the boom in Taiwan's semiconductor industries has created job opportunities and expanded the market for Taiwanese college graduates. For them, the U.S. no longer provides a notably superior living standard compared with Taiwan's. The get-rich-quick environment resulting from stock sales by

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27. Henny Sender, "China Flirts with Venture Capitalism," *Wall Street Journal*, January 3, 2001, p. A3.

TABLE 1 *Chinese and Taiwanese Students Enrolled in U.S. Universities*

Place of Origin	1993↑94	1994↑95	1996↑97	1995↑96	1997↑98	1998↑99	1999↑00	2000↑01
Mainland								
China	44,381	39,403	42,503	39,613	46,958	51,001	54,466	59,939
% Change		↑11.22%	7.87%	↑6.80%	18.54%	8.61%	6.79%	10.0%
Taiwan	37,581	36,407	30,487	32,702	30,855	31,043	29,234	28,566
% Change		↑3.12%	↑16.26%	7.27%	↑5.65%	0.61%	↑5.83%	↑2.3%

SOURCES: <[http://opendoorsweb.org/Lead%20Stories/international\\_studs.htm](http://opendoorsweb.org/Lead%20Stories/international_studs.htm)>; <<http://www.opendoorsweb.org/download.htm>>; author's calculation and adjustment.

semiconductor industries further discourages the younger generation of Taiwanese engineers from pursuing advanced degrees abroad. In many Silicon Valley high-tech firms, senior Taiwanese engineers play the role of "old guard" to mentor young engineers from China.<sup>28</sup> How to compensate for the human resource gap and promote globalization of the lifetime education system is now an urgent question for Taiwan. (This system, which stresses continuing education beyond formal school training, is still under development in Taiwan.)

Another challenge to Taiwan's advantage of advanced talent and capital is that China may develop its own networking mechanism with the global high-tech centers without the participation of Taiwan. The key point is that China's huge market will become the trendsetter for such high-tech sectors as telecommunications. For instance, the number of mobile phone subscribers in China almost doubled in 2000, soaring to 85.3 million from 43.3 million in 1999.<sup>29</sup> In addition, China could lead the world in making Internet appliances, once these simple home or mobile devices surpass personal computers as the main instrument for hooking up to the Web.<sup>30</sup> In order to shorten the product cycle, multinational corporations (MNCs) are choosing to establish R&D bases in China and set up technology transfer and joint research teams with mainland Chinese partners. As a result, it is no longer necessary for these MNCs to seek help from Taiwanese technology talent. Taiwanese-based VC firms and incubators are not the only choice for China when it

28. This phenomenon has been a common practice since 1998. The old-guard phenomenon was observed by the author from November 1999 to September 2000 while serving as a visiting scholar at Stanford University. It was reconfirmed by the author's follow-up interviews from May 6–14, 2001, in the Silicon Valley region.

29. Bien Perez, "China's Mobile Users Double in Year," *South China Morning Post*, April 11, 2001.

30. *Ibid.*, April 5, 2001.



seeks to finance high-tech start-ups. For instance, the U.S.-based International Data Group (IDG) is reported to be investing up to \$1 billion in China's start-up technology companies. IDG expects its annual return on investment to be about 70% to 80% in China, as compared to 30% to 35% in the U.S.<sup>31</sup> All in all, Taiwan's role as a technology and capital broker is facing keen competition as multinational corporations speed up their deployment in the wake of China's World Trade Organization entry.

### Selective Intervention: State Policies to Cope with Talent Flows

China's development in the IT industry differs from the Silicon Valley model of the bottom-up dynamism of innovation.<sup>32</sup> As a latecomer to the high-tech field, the state plays a crucial role by initiating top-down investment policies in such key IT industries as telecommunications and semiconductors.

#### *State Actions by China*

In addition to the state-centered approach to constructing high-tech industries, scholars also perceive that strategies of high-tech industry construction are different from promoting the labor-intensive, export-oriented industries in the 1980s.<sup>33</sup> In the author's view, the state should focus on educating domestic human resources and luring advanced talent from abroad as the core of new economy development. For instance, to attract overseas Chinese students returning home, major cities in China revised their rigid *hukou* (residence-permit) system to allow young talent to obtain permanent residence in a new municipality. The government recognizes that China has never lacked bright young talent; what it really lacks are institutional arrangements and mechanisms to attract and manage this huge market of brainpower.

Acknowledging the importance of advanced talent, China has begun to improve institutional arrangements in order to lure advanced talent from within the international market. The government has pushed the principle of "supporting studying abroad, encouraging overseas returnees, free exit and entrance" as the guideline to attract returning students. Although China does

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31. *Ibid.*, October 11, 2000.

32. For the Silicon Valley model of IT development, please refer to AnnaLee Saxenian, *Regional Advantages* (Cambridge: Harvard University Press, 1994); Chong-Moon Lee et al., eds., *The Silicon Valley Edge*; Martin Kenney, ed., *Understanding Silicon Valley* (Stanford: Stanford University Press, 2000).

33. For the transformation of the role of states in high-tech industries, see Sean O'Riain, "The Flexible Developmental State: Globalization, Information Technology, and the 'Celtic Tiger'," *Politics and Society* 28:2 (June 2000), pp. 157-93; Linda Weiss, *The Myth of the Powerless State* (Ithaca, New York: Cornell University Press, 1998); Martin Kenney and Urs Von Burg, "Institutions and Economics: Creating Silicon Valley," in Martin Kenney, ed., *Understanding Silicon Valley*, pp. 218-41.

not allow dual nationality, foreigners and Chinese with foreign permanent residency status have been allowed to work in China. Its government now grants such persons the same treatment—on a par with local residents—in matters concerning housing, health care, and education. Beijing has also ruled that foreigners who contribute to technological and cultural development can qualify for a PRC green card, which exempts them for five years from needing an exit visa to travel abroad.<sup>34</sup>

In addition to efforts for regulative reform, China has concentrated on promoting specific locations, as international hubs, for talented immigrants. The first priority for metropolitan centers such as Shanghai is to attract overseas Chinese talent, and then skilled foreigners.<sup>35</sup> Currently, foreign residents of Shanghai constitute only 1% of the total city population, lower than the 2% of the 1930s.<sup>36</sup> Shanghai's short-term goal is to revise the legal and institutional framework, including efforts to reform the current residence policy and to treat foreign talent equally with domestic. The Shanghai metropolitan government is helping to resolve problems such as employment and education for returnee spouses, as well as setting up special returned-student regions within major industrial parks such as Zhangjiang, Jiading, Songjiang, and Caohejing. In these parks, the returnee student service centers simplify bureaucratic red tape and provide high-quality infrastructure support at low prices.<sup>37</sup>

The amenities of these industrial parks are better than in other areas of the city. However, the most serious problem facing these overseas returnees is obtaining enough funding to start a new business. Normally, it is difficult for them to get a mortgage loan from local banks, even after intervention by returnee student service centers. Due to the lack of management personnel, returning engineers find it hard to organize a team capable of sustaining an advanced high-tech start-up beyond the early stage of enthusiasm. Regardless of these obstacles, however, Shanghai has attracted around 20,000 returned students, about one-sixth of the national total.<sup>38</sup>

### *State Actions by Taiwan*

By contrast, the major concern for the Taiwanese state in attracting foreign talent is not in luring returning Taiwanese students. In the past two decades, as Taiwan's economic growth has continued, a reverse brain-drain effect has occurred automatically. Taiwanese students earning advanced degrees in the

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34. *Shanghai Daily* (in English), February 19, 2001, p. 1.

35. *Ibid.*, February 19, 2001, p. 1.

36. *Shanghai Jingji Bao* [Shanghai Economic News], May 24, 2000.

37. This information was obtained during my visit to Zhangjiang High-Tech Park in Pudong, Shanghai, on February 19, 2001.

38. *Wenhui Bao* [Wenhui Daily News], Shanghai, October 31, 2000, p. 6.

U.S. frequently chose to return and settle down in Taiwan. Although the Silicon Valley is still the most attractive place for IT industries, Taiwanese talent began to develop technology links and establish businesses on both sides of the Pacific Ocean. These returning students contributed to the take-off of Taiwan's IT industries in the 1990s. The industry boom also has brought about the problem of a shortage of advanced talent. According to a survey conducted by the Taiwan Electronics Association, Taiwan's high-tech industries have a shortage of 57,000 skilled workers.<sup>39</sup> To cope with this shortage, the Taiwanese government plans to revise the current legal and policy framework to attract international talent, including skilled workers from China.<sup>40</sup>

In the ideal world, free mobility of advanced talent should be allowed and even promoted. In the real world, attracting or limiting personnel movement is always mixed with other concerns, such as national security in the broadest sense. In the beginning stage of cross-Strait interaction of advanced talent in the 1990s, Taiwan only allowed mainland Chinese academics to conduct short-term research in Taiwanese academic institutions. The Taiwanese hosts had to go through a complex and prolonged review process and cope with much bureaucratic red tape. In 1998, the scope of allowance was expanded to include talent in the basic and application technology fields. Mainland Chinese talent is permitted to work in the R&D sectors of Taiwanese industries. According to the newest regulations promulgated by the Ministry of Economic Affairs in 2001, individual Taiwanese firms can apply to bring over advanced workers from China in 10 major high-tech fields. The tenure of duration has been expanded from three to six years. There is no ceiling for total numbers of mainland Chinese talent, but the percentage should not exceed 10% of the total R&D staff of individual firms.<sup>41</sup>

Despite the gradual opening to mainland Chinese talent, the total number of mainland Chinese skilled workers working in Taiwan is still limited. Only 730 mainland Chinese high-tech workers had gone to Taiwan by the end of September 2000.<sup>42</sup> While easing legal restrictions, the Mainland Affairs Council has emphasized the need to strengthen its supervising capacities in order to oversee the duration of stay, scope of work, and general activities of

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39. Wu Mingji, "IT chanye fazhan xiankuang yu zhanwang" [Development and prospects for Taiwan's IT industry], Taiwan, *Liangan Jingmao* [Taiwan Strait Business Monthly], no. 111 (March 10, 2001), p. 16.

40. He Meiyue (deputy director of the Economic Planning Commission of the Executive Yuan, Taipei), *Briefing on the Proposal to Promote the Knowledge Economy* [in Chinese], November 4, 2000, p. 12.

41. *Jingji Ribao* [Economic Daily News], Taipei, February 20, 2001; *Zhongyang Ribao* [Central Daily News], Taipei, October 13, 2001.

42. Feng Chen-yu, "Science and Technology Build a Bridge Across the Taiwan Strait," Taipei, *Exchange* (February 2001), p. 36.

mainland Chinese professionals in Taiwan. From the industry perspective, the complex application process discourages the introduction of advanced mainland Chinese IT workers. The skeptical attitudes of the government and the general public further hinder the integration of mainland Chinese talent within the local Taiwanese environment. The result is that in order to avoid trouble, Taiwanese firms often prefer to establish their own R&D teams in China. Such steps can help firms fully utilize China's huge advanced manpower, as well as gain access to the market.<sup>43</sup>

Political concerns and lack of trust deter the normalization of free movement of advanced talent across the Taiwan Strait. In many cases, state intervention conflicts with the impetus toward talent flows induced by globalization that are required by the business community. While the economic bureaucracies stress the shortage of technology talent in Taiwan, government branches in charge of mainland affairs raise worries that introducing mainland Chinese engineers may lead to the rise of the unemployment rate in Taiwan's high-tech sectors. In a public hearing of the state's lawmaking body, the Legislative Yuan, Taiwan's mainland affairs officials suggested the establishment of a software park in the remote Penghu Islands—in the middle of the Strait—to confine and manage mainland Chinese talent.<sup>44</sup> Since advanced human resources are mobile in nature, enactment of any such restrictive policies by the Taiwanese state could further distort the economic mechanism of cross-Strait talent interaction.

Both China and Taiwan are striving to attract the best talent in the world to boost the development of their IT industries. While China is in the early stage of accommodating returning students and advanced international workers by improving amenities and infrastructure, the Taiwanese focus is on introducing advanced Chinese talent and enhancing R&D capacities. However, the effectiveness of state intervention to facilitate free talent flows in Taiwan is constrained by non-economic factors such as national security concerns. Facing the competition from China to attract global talent, these constraints put Taiwan in an unfavorable position. Interviews with a number of top IT managers by the author in 2001 suggest that many Taiwanese IT elite share the view that national security concerns have been mingled with too many domestic political factors. In their opinion, national security should not play a leading role in regulating talent inflows from China. On the other hand, these members of the Taiwanese IT elite are impressed by the stated intentions and effectiveness of China's local officials in metropolitan areas such as Shanghai. As they see it, the sharp contrast between the cautious policies of

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43. Interview with Lee Chungyi, director, R&D department, Acer Communication, April 9, 2001, Taipei.

44. *Lien He Bao* [United Daily News], Taipei, October 21, 2000.

Taiwan and the aggressive drive of China to attract talent may further weaken Taiwan's international competitiveness.<sup>45</sup> The key point in the cross-Strait competition for advanced talent is whether the state can withdraw from issues that it cannot control and concentrate its energies to facilitate institutional mechanisms to cope with market forces brought about by globalization. The author would argue that state policies of selective intervention and selective withdrawal must be based on solid understanding of current economic interactions as they are interwoven with various forces of globalization. Talent flows driven by market mechanisms across the Taiwan Strait are among the most salient phenomena in the era of globalization.

## Conclusion

In the era of globalization, human capital is the most precious asset for boosting high-tech and New Economy development. Different from traditional components of the manufacturing industries such as land and labor supply, advanced human capital is highly mobile. Equipped with professional skills and knowledge, advanced talent enjoys more freedom to choose the best places to maximize its brainpower. The major concerns for high-tech talent are economic rather than political factors.

The integration of ethnic Chinese talent is further facilitated by the networking operations in the high-tech sectors. Economic globalization promotes the international division of labor and cross-border cooperation on IT design, production, and management. The global network of IT industries links major high-tech centers in Taiwan, China, and the U.S. Financial instruments such as VC strengthen this networking link by providing financial support and promoting start-up incubators. Ethnic Chinese technology associations in Silicon Valley also play a key role in enhancing talent cooperation and economic integration across the Pacific Ocean. The global network serves as a vehicle to integrate advanced talents from both sides of the Taiwan Strait. The geographic site of advanced talent integration may be located on either side of the Strait and on either side of the Pacific Ocean.

The downturn of the New Economy boom in Silicon Valley since 2000 has not shaken the basic structure of this cross-Pacific IT triangle. Due to continuous robust economic development in the IT sector in China, Taiwanese firms have speeded up their investment in major Chinese cities such as Shanghai. After encountering domestic difficulties, talented IT specialists in Silicon Valley and Taiwan are also investigating new opportunities in China.

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45. These views were shared by many Taiwanese managers in the IT sector during the author's interviews conducted in April 2001, e.g., Eric Lee, vice chairman, Destiny Technology Corporation, April 19, Taipei; and Duke Liao, president, Advanced Creative Computer Corporation, April 15, Taipei.

In other words, the magnet effect of China has become more pronounced within this IT triangle.

To cope with the global trend of autonomous flows of advanced talent, states choose to transform their instruments and ways of intervention into economic life. The case of cross-Taiwan Strait talent flows indicates that instead of strengthening the regulative framework to control talent outflows, some states are beginning to revise legal restrictions to provide favorable conditions to attract advanced talent from abroad. These efforts are demonstrated by the new policies of Taiwan and China to extend the work scope and duration of stay for foreign professionals, and also, policies to attract ethnic Chinese high-tech elite abroad. However, Taiwan's policies to introduce Chinese talent are constrained by domestic political concerns over national security. On the other hand, urban centers on both sides of the Taiwan Strait are putting special efforts into improving infrastructure and luring global talent. Such efforts include improving transportation, communications, the environment, and general amenities. The more important task of these urban centers is to create a global culture of diversity and tolerance. In order to attract the best brainpower from around the world, states are often choosing to cooperate with urban centers to promote material and cultural amenities. One model is Silicon Valley and the San Francisco Bay Area in which it is located, which share numerous advantages, from major universities and high-tech institutions to cultural and environmental amenities. These elements have long been major factors in attracting advanced IT talent.

Top-down policies to create high-tech centers are no longer workable solutions. In order to help foster an ideal location of talent interaction, cooperative mechanisms have been gradually developed between central authorities, local governments, and civil society. The study of cross-Strait talent interaction demonstrates that economic globalization has brought the bilateral relationship into the global arena. Globalized market forces promote new waves of Taiwanese high-tech investment into China and also an outflow of brainpower. Advanced talent interaction between Taiwan and China is not realized by bilateral channels but by trans-Pacific, high-tech networking. In other words, the uncertain situation of talent flows that both sides of the Taiwan Strait are facing is the outcome of a global division of labor in economic relations. New dynamics promoting talent flows such as VC and ethnic Chinese technology associations are trans-border, or borderless, in nature. To cope with the bottom-up, globalized market forces of talent flows, there exist only limited sets of instruments for state intervention. Selecting appropriate policy instruments for intervention, and carefully withdrawing from political entanglements that distort market mechanisms into inward-oriented policies, are real tests for state accommodation and transformation in the era of globalization.