



Ties That Bind

**The San Francisco Bay Area's
Economic Links to Greater China**



Bay Area Economic Forum

**A Partnership of the Bay Area Council and
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Ties That Bind

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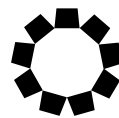


November 2006

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**BAY AREA
ECONOMIC
FORUM**

*A Partnership of the Association
of Bay Area Governments
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**Association
of Bay Area
Governments**

Bay Area Economic Forum

201 California Street, Suite 1450

San Francisco, CA 94111

(415) 981-7117

(415)981-6408 Fax

info@bayeconfor.org

www.bayeconfor.org

This report is dedicated to the memory of Dr. Chang-Lin Tien,
Chancellor of the University of California at Berkeley
and Chairman of the Bay Area Economic Forum,
who enthusiastically contributed through his scientific, educational,
business and cultural activities to U.S.-China cooperation and understanding.



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Introduction

About This Report

The Bay Area has a long history of close economic and cultural ties to “Greater China”—including Hong Kong and Taiwan, whose own economies are being increasingly integrated with the mainland through trade and investment.

The purpose of this report is to provide a picture of the breadth, depth and value of the Bay Area’s connection to Greater China, and assess the contribution this relationship makes to the regional economy.

We will examine historic connections, dating back to the arrival of U.S. merchant ships in Canton harbor and the arrival of the first Chinese immigrants to San Francisco in the mid-1800s. We will consider the community, professional, academic and other networks that have developed in the Bay Area’s Chinese-American community over time. And we will offer a look at key Bay Area business sectors, and the cross-fertilization of Northern California and Chinese companies, talent and ideas. No study of this kind can claim to be exhaustive: Inevitably some individuals, businesses, institutions and even industry sectors may not receive the attention and analysis they deserve. Our objective is, through examples, to convey the breadth and depth of the overall Bay Area-Greater China relationship and the market and policy environment in which it operates.

The Bay Area-Greater China relationship is, in many respects, a unique economic asset that leverages comparative advantages on both sides of the Pacific: The region’s educational institutions and technology-led economy for decades have attracted students, scientists and technologists from Greater China, who in turn have made major contributions to the Bay Area and its economy. From semiconductors to venture capital, architecture and urban planning to legal services, and all aspects of the internet, Bay Area companies have pioneered the opening of China’s economy to international trade and investment. In doing so, they have contributed to economic growth at home, and influenced the course of Chinese development. In the process they have positioned the San Francisco Bay Area as the premier portal in the country for U.S.-China exchange.

It is not, however, a relationship that can be taken for granted. In a final section, we will discuss a number of strategies and ideas for strengthening U.S. competitiveness, for nurturing and expanding existing cross-border ties, and for avoiding policy missteps which can erode the economic opportunities as the China market matures.

China Enters the World Stage

China’s entry into the World Trade Organization (WTO) in December 2001 accelerated an already unprecedented economic expansion. While economic reform has been underway since the

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1980s, the past four years have seen a dramatic transformation in China, from an insular, planned, developing economy to a more global, market-based, industrialized one.

The speed and scale of this transformation is remarkable. China's economy has more than doubled in size since 1999, to an estimated \$2.2 trillion in 2005, and since 2002 has been growing at 9–10% annually. It now ranks as the world's fourth largest economy. Much of this growth is tied to market-based reforms. State-owned enterprises (SOEs), which once dominated China's economy, now account for less than one-fourth of its GDP, reflecting a surge in private and entrepreneurial activity. This parallels China's growth as a major consumer market. Where state-owned enterprises in the auto, steel and oil industries once dominated the Asian Wall Street Journal's reader survey of China's most admired companies, in 2006 all of the top ten were consumer-oriented companies such as Haier (refrigerators and appliances), Lenovo (computers) and Baidu.com (internet).

Foreign direct investment (FDI) has played a central part in this growth as China has opened most industry sectors to foreign participation. Annual FDI has grown from \$53.5 billion in 2003 to \$60.6 billion in 2004 and \$72.4 billion in 2005, with investments ranging from fixed asset investment in export manufacturing plants, to mergers and acquisitions and equity positions in state-owned enterprises. IBM Global Services reports that in 2005 China was the world's top destination for investment in manufacturing facilities, and its number two destination for investment in research and development (R&D) facilities. Cumulative FDI in China is currently about \$941 billion, with the U.S. as the fifth largest investor.

U.S.-China trade has exploded in recent years, largely as the manufacture of consumer electronics, apparel and footwear, home furnishings, building supplies, sporting goods, toys, machinery, tools and other products has shifted from the U.S., Europe, Japan, Latin America and elsewhere in Asia to China. U.S. exports have increased as well, as China's appetite has grown for steel, aluminum, petrochemicals, cotton, feed grains, paper, forest products, machinery and scientific equipment, transportation equipment, semiconductors, consumer goods, food and beverages. The U.S. ran a \$201.6 billion trade deficit with China in 2005 (\$243.5 billion in imports vs. \$41.8 billion in exports).

It is worth noting, however, that China's overall trade surplus with the world was far less, \$101.9 billion. In part, the rising U.S.-China trade imbalance has been the result of an increasingly integrated Asian economy, in which China is the final point of assembly before a product is shipped to the U.S. Much of the value earned from those exports accrues to manufacturers and suppliers in Hong Kong, Singapore, South Korea, Taiwan, Japan and the United States, from whom China "imports" components and sub-assemblies. At the retail stage the U.S. benefits from branding and advertising of the finished product. As the U.S.-China Business Council points out, China's share of the U.S. trade deficit grew from 23–26% between 1996 and 2005, while the rest of Asia's share fell during that period from 42–18%.

Manufactured exports have helped make China the world's largest industrial producer and its largest holder of foreign exchange reserves, which have grown from \$286 billion in 2002 to an expected \$1 trillion by the end of 2006. Of that, as much as 70% is believed to be in the form of

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dollar-denominated assets, primarily U.S. Treasury certificates—reflecting both the large trade deficit and a desire by China to stabilize its currency, the yuan, against the dollar.

As China has moved up the economic ladder, its mix of export products has increased in value and quality. These export industries have provided jobs for one of the largest rural migrations to urban centers on record—140 million people. As of August 2006 China's government and the World Bank estimated a nationwide per capita income of \$1,740. While this figure reflects rapid growth, it masks a large disparity (in the range of 3:1) of income between urban, primarily coastal areas, and China's less developed interior.

The absence of an adequate health, pension and education safety net, and few investment alternatives for businesses or individuals, have produced an aggregate 49% nationwide savings rate. McKinsey & Co. has estimated that in 2004, 36 million Chinese households earned at least the 25,000 renminbi (\$3,000), a threshold of savings and disposable income necessary for entering the middle class; as many as 105 million households may meet the threshold by 2009.

The scale of economic growth and activity in China is often difficult to grasp. China has:

An estimated 99 Chinese cities with populations greater than 1 million.

- 4,000 skyscrapers (18+ stories) in Shanghai alone, with 1,000 more planned.
- A car market that tripled from 2000–05 to 20 million cars, with 10–20% annual growth forecast.
- A 23,000-mile national highway system that will grow to 55,000 by 2020.
- 37 new international airports, with 48 additional airports planned.
- 111 million internet users, half with broadband service, growing to 232 million in 2010.
- 416 million mobile phone subscribers, with 59 million added in 2005 alone.

As its economy has grown, China has become the world's largest consumer of steel, zinc, copper and iron ore, and its second largest consumer of oil. Its demand for commodities and raw materials is impacting global markets and prices, helping economies in many developing countries but raising policy concerns in the United States and Europe about competition for resources.

China's economy is closely interconnected with that of the United States. American firms are flocking to China to participate in—and profit from—its explosive development. While foreign businesses have been active in China since the 1980s, due to immature markets and government restrictions, many were not profitable. But a sea change is now taking place, stimulated by China's entry into the WTO.

A 2005 survey of U.S. companies by the American Chambers of Commerce in Shanghai and Beijing found that 68% of participants were producing a profit, and 86% had seen their profits increase in the previous year.. Roughly half of those reporting a profit indicate a profit margin better than their global average, and 82% had increased their China business in the past year. The survey also found that China is a “number one priority” for global investment for 33% of the companies responding; 79% said China was their company's top FDI destination, Significantly, most (62%) said that producing goods and services in China for the China market, is their major

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goal. Of the balance, some companies produce for a mix of Chinese and global markets, while only 10% are in China to take advantage of a lower cost structure and sell back to the U.S. For many of those, the lower cost of having a China operation helps them remain competitive and sustain jobs in the U.S.

Doing business in China is not without challenges. For many foreign firms operating in China, regulation (bureaucracy and lack of transparency) has been a problem. Despite its market elements, the role of government in the economy remains pervasive. Competition among foreign and domestic firms has intensified, increasing price pressure and eroding margins. Other challenges include intellectual property rights (IPR) infringement, and growing difficulty in finding and retaining qualified local managers. In major cities, local pay packages are now approaching expatriate rates, and in some industries employee poaching is common. As personnel and real estate costs in coastal areas and major cities such as Beijing and Shanghai rise, more U.S. companies seek opportunities in second-tier cities in China's interior. This brings new challenges in logistics and staffing, and even weaker IPR enforcement than in Beijing or Shanghai, where central government influence is stronger.

Despite its breakneck growth, China faces economic challenges of its own. Energy shortages and poor transmission infrastructure produce routine power outages, and a heavy reliance on coal-fired generating plants has degraded air quality nationwide. Compounding its severe environmental problems, the nation faces looming issues of water quality and availability, in its urban areas.

Billions of dollars in savings deposits with major banks are tied up in loans to poorly performing state-owned companies. Linkage of the yuan to a basket of currencies instead of the dollar in July 2005 has resulted in an expected 4% appreciation by yearend 2006, but the currency is believed to be undervalued by at least 20%. Many economists argue that the size of China's economy, its per capital income and other indicators should be stated on a purchasing power parity (PPP) basis. Using PPP as a measure, China's economy increases from \$2.2 trillion to nearly \$8.2 trillion, according to U.S. State Department estimates—larger than that of Japan and second only to the U.S. Annual per capita income is restated as \$6,210.

An estimated 87,000 public protests or disturbances occurred across China in 2005, many linked to corruption or to local and provincial government appropriation of rural land for development. It has been estimated that China must generate 200 million new jobs over the next 20 years simply to absorb displaced rural workers and families moving to Chinese cities, and to reduce the gap between rural and urban wages. This will in turn require a minimum 8% annual GDP growth, and a new rural development model to improve the lives of some 800 million remaining rural residents. Cities will not be able to accommodate them and, with only 15% of China's land arable, traditional farming will not offer a full answer either.

Finally, security concerns over China's ongoing military buildup, its weapons exports, and its uneven enforcement of intellectual property protection inhibit the more advanced technology transfer that China seeks. While foreign companies are increasingly monitoring the workplace

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practices of their suppliers, criticism in the U.S. and elsewhere of Chinese labor and human rights practices also constrains on what could be an even more expansive relationship.

The extent to which China's economy has opened to foreign investment, the involvement of U.S. and California firms in that opening, and the recent difficulties Chinese firms have experienced in the U.S. market—China National Offshore Oil Co's proposed acquisition of Unocal, Haier Corp.'s abandoned plan to buy Whirlpool, opposition to China Ocean Shipping Co.'s terminal development plans in Southern California—all suggest a need for broader, more nuanced thinking about the relationship. As this report will show, the Bay Area has a major stake in the outcome, and unique assets through which to assert its influence.

Ties That Bind

Executive Summary

The San Francisco Bay Area's unique relationship with China dates back more than 150 years. It is a relationship that is complex, diversified, and from which both sides benefit. Close ties grow out of the region's geographic proximity on the West Coast of the United States, and its historic reputation among Chinese as a place of opportunity dating back to 1849 and the Gold Rush, when Northern California was called Gam Saan, or Gold Mountain.

Early History

Two men and a woman, hired as servants, were the first Chinese immigrants to arrive on the West Coast in 1848. News of the Gold Rush a year later, brought by merchant ships, reached China before reaching the East Coast. Families and villages throughout Guangdong Province pooled money to send their young men on the 45-day, \$55 voyage to seek fortune in California. They worked in mines, restaurants and dry goods stores. Over time they settled on farms, blasted tunnels and laid tracks for the transcontinental railroad, and started laundries, canneries, shoe factories and gambling parlors.

Chinatowns became fixtures in San Francisco, Oakland, San Jose, Sacramento and Stockton, with their own banks, telephone exchanges and Chinese opera houses. By the early 1900s more than 100,000 Chinese immigrants resided in the U.S., 45% of them in the San Francisco Bay Area. Discriminatory taxes, labor laws and "urban renewal" schemes to curb immigration were unfortunate realities in the late 1800s. The 1882 Immigration Act—known as the Chinese Exclusion Act—barred Chinese laborers from entering the U.S. until 1943. Nevertheless, merchants, students and family members continued to travel back and forth, and between 1910 and 1940 over 175,000 Chinese immigrants were processed through the Angel Island Immigration Station.

Evolving Networks

Benevolent associations tied to particular families, or to regions of Guangdong Province, provided networks to help new arrivals get settled, to lend money, to mediate disputes within the Chinese community, and to represent Chinese interests in the larger community. The assimilation of Hong Kong immigrants in the 1960s, an influx of Mandarin-speaking Taiwanese immigrants in the 1970s with a different perspective from the Cantonese-speaking establishment, and the spread of new student and professional immigrants throughout the Bay Area in the 1980s and 1990s subsequently contributed to the decline of Chinatown centers and associations, and the emergence of new, and more business and professionally based networks.

Successive waves of immigration—first from Hong Kong, then Taiwan, then the People's Republic of China (PRC)—have provided critical talent, capital and initiative that have revitalized the region from Silicon Valley to Sacramento. High home ownership rates and education levels, plus investment in small businesses and commercial property, combined to create new wealth within the Bay Area's ethnic Chinese community. But as immigrant professionals and Chinese-

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Americans increasingly encountered a glass ceiling at the companies where they worked, a new entrepreneurial pattern began to take shape in the early 1980s.

A proliferation of Chinese university alumni groups, and professional associations of scientists, engineers, CPAs and others—many with overlapping memberships in the thousands—provide business networks and a sense of community, particularly for new immigrant arrivals. This has developed as an invisible but important infrastructure for the development of Bay Area-China business. Umbrella groups with chapters in Silicon Valley and greater China—the Monte Jade Science & Technology Association, Hua Yuan Science & Technology Association and Hong Kong SV.com—have sought to expand two-way trade and investment and reverse the brain drain from Taiwan, the mainland and Hong Kong, respectively, by reconnecting overseas scientists, engineers and entrepreneurs with companies, universities and technology parks back home.

A Diverse Economic Partnership

Ethnic Chinese today make up roughly 8% of the Bay Area's population of nearly 7 million, according to 2005 U.S. Census Bureau data, with the highest concentrations in San Francisco (20.6%), Alameda (9.5%) and Santa Clara (8.6%) counties. Many of these residents have family histories reaching back generations. The ethnic Chinese community is far from monolithic: Hong Kong, Taiwan and mainland nationals speak different dialects, come from distinct histories, and pursue different commercial interests through mostly separate networks of contacts. Foreign nationals often do not share cultural or business affinities with Chinese-Americans. Yet the community's overall contribution to trade, investment, job-creation, philanthropy, technological innovation and entrepreneurial vitality is undeniable.

Some 5,500 foreign students from greater China (the PRC, Taiwan and Hong Kong) at Bay Area universities in academic year 2004–05 contributed as much as \$127.5 million to the region's universities and economy in tuition and living expenses. Foreign-born Chinese donors have donated more than \$50 million to Stanford over the years, and \$53 million to the University of California at Berkeley since 2000.

Stanford, Berkeley, UC San Francisco, UC Davis, San Francisco State University, the University of San Francisco and Santa Clara University all have extensive ties to Greater China through their Asian studies institutes, alumni networks, fellowship and visiting scholar programs, and departmental exchanges in business, law, engineering, biomedicine, agricultural science, history and economics.

Two-way manufactured trade with greater China through Bay Area ports and airports in 2005 totaled nearly \$27 billion—\$17.6 billion in imports and \$9.4 billion in exports. The number of containers shipped from greater China to the Port of Oakland nearly doubled between 2001 and 2005, and the number of containers bound for China, Hong Kong and Taiwan increased during the same period by half. In all, the Port of Oakland handled 419,000 40-foot containers moving in both directions, making China the Port's top trading partner and the driving force behind its business expansion. Other Bay Area ports moved bulk shipments of metal scrap, wood pulp, petroleum products, industrial earths and other basic commodities.

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As Silicon Valley's economy expanded in the late 1990s, more than 2,000 Silicon Valley technology firms were launched by Chinese entrepreneurs, many of them graduates of Bay Area universities. In 1998 they accounted for an estimated \$13.2 billion in annual sales and nearly 42,000 jobs—17% of the Valley's high-tech economy at its peak. In 2005, an estimated \$300–400 million in Silicon Valley venture capital funding was invested in China, and new funding rounds are expected to raise \$4 billion in 2006 .

Bay Area firms are actively engaged in building modern China:

- China's internet runs on Cisco routers and switching equipment; Google, Yahoo! and eBay do sizable transaction and advertising business; most major Chinese portals, payment systems and gaming, dating and travel sites were funded from the Bay Area.
- Hewlett-Packard, Intel and Oracle systems and services power China's largest banks, hospitals, industrial companies and government agencies.
- Sun Microsystems' Linux-based Java operating system is the industry standard for Chinese government and schools.
- Equity investor Newbridge Capital is the first foreign entity to hold a controlling interest in a major Chinese bank.
- Bay Area legal and accounting firms were early movers in restructuring China's financial, manufacturing and tech sectors through mergers, acquisitions and initial public offerings (IPOs).
- San Francisco architects and urban planners have built some of China's tallest skyscrapers, masterplanned major urban developments, pioneered historic restoration, and are building environmentally sustainable office parks and planned communities throughout the country.

Chinese investment in the Bay Area is still largely in commercial and hotel property, angel and venture investment in Silicon Valley technology companies, and small-scale retail. The \$1.05 billion purchase of San Francisco's Bank of America Center by a Hong Kong investor group in September 2005, and Hong Kong-based Cornerstone Overseas Investment's acquisition of Emeryville toymaker Wham-O Inc. in January 2006, generated headlines, as did China National Offshore Oil Co. (CNOOC)'s bid against San Ramon-based Chevron Corp. for Unocal Corp. Although residential real estate investment remains strong, commercial investors retrenched after the bursting of the tech bubble. Many have cashed out Bay Area holdings and reinvested in China, where they see greater profit opportunities.

Cumulative Chinese investment overseas at the end of 2005 totaled \$57.2 billion, according to China's Ministry of Commerce. Chinese direct investment overseas during 2005 totaled \$12.26 billion, a 123% increase over 2004. The U.S. was the destination for 10.3% of that investment. Chinese consumer goods and technology firms will increasingly be looking for complementary mergers and acquisitions, strategic partnerships and equity investments that will help them build global brands and obtain access to markets and technology. Some transactions are likely to raise security and intellectual property concerns—including questions about so-called “deemed exports” of technology through shared personnel and data within a merged entity.

Building Bridges, Leveraging Assets

The San Francisco Bay Area's relationship with China is a unique asset and an important contributor to the regional, state and national economies. But it would be a mistake to take the relationship for granted.

A growing economy is offering attractive opportunities for Chinese students and scientists to stay at home to build companies and careers, at the same time as immigration restrictions are making it more difficult for Chinese to come to the U.S. Chinese universities and technical institutes turn out more than 350,000 engineering graduates annually, and the quality of China's educational institutions is improving rapidly. Incentives including cash grants, startup funding and technical support after graduation, and exemption from military service (in Taiwan), are offered to students who stay home to attend university. The scale of China's market offers talented Chinese entrepreneurs and managers an opportunity to build new companies and industries from scratch. Meanwhile, post-September 11 security policy has made it more difficult for Chinese students and professionals in specialized fields to obtain J-1 visas, and demand far exceeds supply for H-1B visas.

In the course of conducting interviews and other research for this report, a number of ideas surfaced for ways to position the Bay Area's economy in relation to China, and to further expand the Bay Area-China relationship. These fall into two broad categories: a) policy measures in Sacramento and Washington to strengthen U.S. competitiveness; and b) measures that can be taken by the public and private sectors in the Bay Area to leverage regional assets, expand trade and investment opportunities, and strengthen the Bay Area's position as the premier U.S. gateway for business and other exchanges with China. Some of these ideas reflect broad statewide and national competitiveness concerns, while others focus on specific local policy measures. Among them:

Economic competitiveness

1. Strengthen science and math education at the university and high school levels;
2. Promote closer cooperation between industry and education to support continuous workforce skills development and training;
3. Keep the door open to overseas student, scientific and professional exchanges;
4. Increase federal and state funding for scientific research;
5. Ensure that Federal trade and investment policies avoid politicization and reflect the reality global markets

Bay Area Initiatives

6. Elevate the priority of Chinese-language instruction in elementary education, high schools and junior colleges;
7. Promote the Bay Area as a location for Chinese investment;

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8. Establish regional China-focused business support entities to facilitate business development and project Bay Area interests;
9. Increase capacity at, and logistical access to, the Port of Oakland and the Bay Area's international airports;
10. Promote the Bay Area as a destination for Chinese students and leisure travelers;
11. Support cultural activities that strengthen Bay Area-China linkages.

Most of the above proposals would not entail large or extraordinary public expenditures, and would not require major government initiatives. Many represent a simple reordering of existing public priorities, and improved regional policy coordination.

Greater China is not the only area of the world requiring special attention as the San Francisco Bay region seeks to assert global leadership. But its historical ties, social and cultural infrastructure, university and technological base, and record of entrepreneurship place the San Francisco Bay Area in a unique position to participate in, shape and benefit from China's economic growth. Due to the depth and breadth of its connections, the Bay Area has emerged as a major portal for U.S.-China business as well as non-economic exchange. The depth and breadth of market intelligence on China and the technological and financial resources that can be found here, make the Bay Area a location of choice for businesses seeking to participate in the China market. The challenge before us is to develop a strategy to leverage these assets to advantage. Success in doing so will position the Bay Area, even more so than today, as a global business, education, and cultural center in the 21st century.

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1

A Rich History of Work and Reward

The San Francisco Bay Area enjoys a unique relationship with China, due first to an accident of geography—its relative proximity to Asia—but also to a reputation among Chinese as a place of opportunity dating back to the 1849 Gold Rush era, when Northern California was known in Guangdong Province as Gam Saan, or Gold Mountain.

America, as a new nation, first opened trade with China beginning in 1784. In 1787, five sailing ships called at Canton. U.S. commercial interests established a Canton representative agency, or “factory,” under Chinese management with Chinese government authorization, to handle trade during the 1830s. Sixty American ships called at Canton in 1847, discharging heating oil, agricultural products, lumber and manufactured goods, and loading silks, pigments, crafts, spices and delicacies.

The Lure of Gold

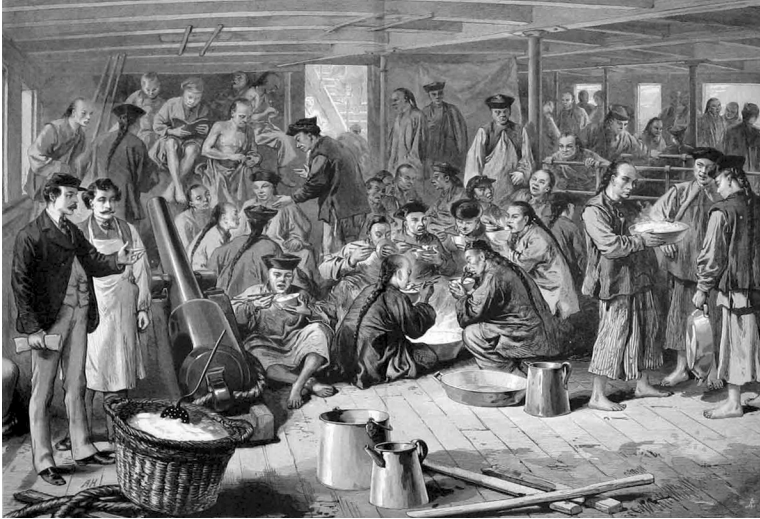
The first Chinese immigrants in California were two men and a woman, arriving on the brigantine *Eagle* on February 2, 1848, brought over as servants for the family of C.V. Gillespie, a San Francisco merchant and importer from China. The following year, merchant ships calling at Canton brought news of gold discovered in California. Overpopulation and famine in China after the Taiping Rebellion prompted families at the time to send young men abroad to earn money. Shipowners promoting Gam Saan as a land of opportunity were eager to attract passengers traveling “steerage” in cramped quarters below decks. The voyage to San Francisco took 45 days and cost \$55.

Transport of Chinese laborers became a staple of Pacific Mail Line’s China service, providing return revenue that helped the line win a lucrative government mail contract. For many years, the Pacific Mail dock in San Francisco served as the processing center for Chinese immigrants. Most of the arrivals were from rural areas in the Pearl River Delta of Guangdong Province: of the estimated 47,000 Chinese immigrants on the West Coast in 1860, fewer than 600 were women.

Many Chinese immigrants traveled to the U.S. under labor contracts with merchants in China or with American middlemen who solicited them and arranged their passage. They worked as servants, cooks, waiters, in laundries and in cigar or shoe factories. But contracts often proved unenforceable and laborers ended up mining or prospecting on their own in the Sierra foothills. Chinese workers distinguished themselves as hard workers and shrewd entrepreneurs. Some had

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mining experience in China and Southeast Asia, and brought with them special skills in excavating and extracting ore. They were known for extracting significant gold deposits from mines and claims abandoned by earlier prospectors.



Chinese immigrants traveling to California in the steerage accommodations of Pacific Mail's steamer "SS Alaska" in 1876.

(From the collection of Steve and Jeremy Potash, Oakland, CA)

In later years Chinese laborers made up most of the workforce laying track for the San Jose Railroad, the California Central Railroad from Sacramento to Marysville, and the transcontinental California Pacific Railroad from Sacramento to Promontory Point, Utah. For \$28 a month, they took on dangerous jobs such as planting nitroglycerine in cliffs while suspended in baskets on ropes. Several hundred lost their lives through accidents or working through harsh winters. Chinese also played a major role at this time constructing levees in the Sacramento River Delta area, a massive reclamation effort that subsequently enabled the large scale development of agriculture in the Sacramento Valley.

Crossing the Sierra

"Throughout its history, American California has always imported its labor when necessary. The construction of the Central Pacific offered the first case in point. It was one thing to build a rail line from Sacramento across the valley floor, even to nudge it into the foothills; but when it came to crossing the Sierra Nevada, construction chief Charles Crocker knew that he had a problem. There were not enough men in California willing to do this sort of backbreaking work at the price Crocker was willing to pay.



Surveying the labor pool of California, Crocker could see that there were thousands of Chinese in the state, most of whom had, for reasons of racial exclusion, been marginalized out of

mainstream employment. And yet Crocker knew that these Chinese men, as miners and agricultural laborers, had long since proven themselves strong and sinewy, disciplined and dedicated, persistent and inventive; and so in 1865 Crocker hired fifty of them as an experiment. He would eventually have some ten thousand in his employ, and cumulatively, over the next four years, these Chinese workers would achieve an epic of construction second only to the Great Wall of China itself: the crossing of the Sierra Nevada with bands of steel, including the penetration of a near-solid rock barrier with the Summit Tunnel, hewn by hand from solid rock.

Moving ties and rails, pounding spikes with a force that seemed to explode from their muscular bodies, lowering themselves in baskets down sheer cliffs to dig holes for dynamite out of solid rock, taking direction meticulously despite barriers of language, dying in unknown (because unrecorded) numbers from accidents, day in, day out across six years, in case laying ten miles of track in a day, “Crocker’s Pets,” as the Chinese were derisively called, more than proved their mettle against competing Irish workers of the Union Pacific. They established for all time (although it would take more than half a century for this to become clear in the minds of white California) the right of the Chinese to live and work in the Golden State: even more, to insert “Sino-Californian” into the essential formula of American California itself.”

Kevin Starr, author of “California”

Chinese Communities Take Shape

As early as 1849, Chinese merchants in San Francisco formed a *gongsi*, or association to mediate disputes within the Chinese community, and to facilitate commercial dealings with outside interests and participate in civic events. From 1851–54, six benevolent associations were formed representing various immigrants from specific districts within Guangdong Province. These associations offered aid with the immigration process, housing, and local customs. They lent money, helped start businesses and represented Chinese interests in countering discrimination. Churches with missionary ties to China taught English to parents and children

Family associations were established (including protective societies known as *tongs*), along with a separate benevolent society to arrange medical care, lend money for return to China and arrange burial of remains in China for the elderly. In 1862 a *kung saw*, or neutral public association, was formed to settle disputes among associations. Out of this business and commercial network, the

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Chinese Six Companies were formed in 1882 at the urging of Chinese Consul General Huang Tsun-chien.

Buildout of the California railroads and an end to the Gold Rush left large Chinese communities dispersed from the farms of San Luis Obispo and Stockton to the railroad towns of Sacramento and Marysville. Growing discrimination in rural areas of California, Washington and Idaho forced many Chinese back to cities where they found protection in numbers. The 1868 Burlingame Treaty with China permitted unrestricted immigration but prohibited naturalization, resulting nonetheless in a further surge of immigration.

From the 1850s on, the Bay Area Chinese community was a significant contributor to local economies. The dozen or so square blocks that formed San Francisco's Chinatown spread out from the Long Wharf that linked the financial district and northern waterfront, with its restaurants, residential hotels and small factories. In the 1870s, Chinese fishermen came to dominate the shrimping industry, with more than 20 camps along the section of southeast San Francisco waterfront now known as Hunter's Point, and on the San Rafael estuary that is still called China Camp. The shrimps were sun dried and exported to China as a food enhancing agent. The last Chinese shrimp companies ceased operation in the 1950s.

In 1870, 24% of Chinese immigrants in the U.S. resided in the Bay Area; by 1900 that percentage had nearly doubled to 45%. Chinatowns became fixtures in San Francisco, Oakland, San Jose, Sacramento and Stockton. In the East Bay, Chinese laborers worked in factories and on dam projects under construction in the late 1800s. They also grew and sold fruit and vegetables in Oakland's five Chinatowns in the late 1800s. Historic maps described the 1888 Woolen Mills Chinatown in San Jose as including two restaurants, a laundry, a warehouse, "gaming and sleeping rooms," wok ovens along the river, a theater, two temples, the Woolen Mills—a textile and garment factory—and the Garden City Cannery.

Since the 1850s, discrimination against Chinese immigrants—centering mainly on jobs—had been an unfortunate reality. Repeated proposals on the West Coast for tougher enforcement of labor contracts, a head tax on foreign miners, and outright immigration curbs, were all beaten back but by smaller margins each time. Economic depression in the 1870s, speculative investing and drought cost many Californians both fortunes and jobs, providing a tipping point that turned an 1877 San Francisco labor solidarity rally into three nights of anti-Chinese rioting. Churches close to the Chinese community, through missionary work in China and schools offering English-language instruction and basic education in San Francisco, came to the aid of immigrant families. Chinese ties to the Jesuit Order and the Presbyterian Church in particular remain strong today as a result.

Congress subsequently passed the 1882 Immigration Act, also known as the Chinese Exclusion Act, barring U.S. entry for Chinese laborers entirely, and allowing in merchants, their servants and families, diplomats, travelers, teachers and students, but prohibiting them from obtaining citizenship. The Act, signed into law by President Chester Arthur, remained in effect until 1943. Chinese immigration fell from 39,500 in 1882 to 10 in 1887, although applications for entry into

the U.S. under “exempt” categories—merchants, diplomats, students and scholars, children of U.S. citizens—continued.

By the 1890s, with 85,000 Chinese on the West Coast, the local phone company’s central switchboard could no longer handle the volume of calls to Chinatown. Oriental Daily News editor Loo Kum-shoo, born in Marysville and a University of California graduate, quit his job to open the Chinatown 5 Exchange, a separate switchboard with its own phone book that by 1911 listed 1,134 customers and by 1923 handled 17,000 calls daily.

The 1906 Earthquake

Chinatown was among the areas of San Francisco totally destroyed during the earthquake and fire of April 18, 1906. The earthquake proved both a blessing and a curse, producing a more permanent and resilient Chinese community and offering a way around the Chinese Exclusion Act.

Thousands of Chinese fled the city in the aftermath of the earthquake, denied any form of government relief. Most came to Oakland, where Lew Hing, himself a refugee from the quake, opened the two city blocks of his Pacific Coast Canning Co. to the new arrivals. He provided food, tents and medical attention to those in need. Later, to help finance the rebuilding of San Francisco’s Chinatown community, he partnered with merchant Look Tin-eli to establish the Bank of Canton in 1907. A year later it was the principal bank for 100,000 overseas Chinese in the U.S. and Mexico.

Lew Hing, Look Tin-eli, the Six Companies and various family associations were instrumental in Chinatown’s reconstruction. Heading off efforts by City Hall to condemn and raze Chinatown entirely after a false bubonic plague scare, Look brokered construction of pagoda-style replacement buildings, by Irish contractors and workers. The family and benevolent associations came together to build a new hospital and high school. Chinese language schools, a YMCA, YWCA and other institutions followed.

During the years immediately following the earthquake many Chinese immigrants felt encouraged to return to China, to seek work and education after the overthrow of the Manchu Dynasty and the establishment in 1912 of a Kuomintang (KMT) republic under Dr. Sun Yat-sen. Dr. Sun had visited the community raising funds for the revolution prior to 1911. When major floods devastated parts of China in 1912, the Bay Area Chinese community contributed substantial funds to support relief efforts. As a result of these early ties, the West Coast Chinese community remained largely loyal to the KMT when they fled to Taiwan after the 1949 Communist revolution.

One apparent benefit for Chinese immigrants arising from the 1906 earthquake was the destruction of most San Francisco citizenship and residency records. This led to a sharp increase in immigration applications from young men known as “paper sons,” most claiming to be children of citizens. The Chinese Exclusion Act restricted travel between China and the U.S. to specific exempt classes of immigrants, primarily merchants and families of citizens. Prior to 1906, travel

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typically involved a burdensome process by which immigrants obtained “certification” as merchants from non-Chinese business owners.

Angel Island Immigration Station, on San Francisco Bay, served from 1910–40 as an entry point for Chinese immigrants. Despite practices subjecting applicants to aggressive interrogations, medical examinations, separation of families and detention averaging two to three weeks but in some cases as long as two years, over 175,000 Chinese immigrants were processed. This era ended with World War II, when the Exclusion Act was repealed as China and the U.S. became allies.

By 1915 the Chinese community had become more integrated in the fabric of San Francisco, as demonstrated by the assistance it gave Mayor James “Sunny Jim” Rolph with arrangements to bring a large exhibit from the new Republic of China to the Panama Pacific International Exhibition on Treasure Island. By the 1920s, Chinatown boasted six theaters featuring performances of Chinese opera, with the largest seating up to 2,500.

Two-Way Trade Grows

Business interests in the eastern and southern U.S. were obsessed with opening foreign markets in the 1890s, as industrial processes became increasingly mechanized and production began to outpace domestic demand. Steel, oil and textile producers formed the American-Asiatic Association in New York, lobbying President McKinley to enforce an ‘open-door’ China trade policy. Their target: a vast China market, believed at the time to be as large as 400 million people, which was under assault from European and Japanese competitors seeking exclusive trade concessions and port leases.

Only four of the Association’s 250 members in 1898 were based west of the Mississippi. Yet 30% of U.S. imports from China, and 17% of U.S. exports to China, moved through the Port of San Francisco in 1898, and Northern California exported large volumes of agricultural products and lumber to China. Northern California companies introduced milled flour and kerosene heating oil to the Chinese market. Fuller & Heather Co., a Sacramento firm later to become Fuller Paint Co., first sold turpentine in Hong Kong in 1866, trading it for white lead, Chinese vermilion and other pigments.

Bay Area exports to China grew from \$2.6 million in 1894 to \$8.7 million in 1906, according to Chamber of Commerce reports. The San Francisco Chamber of Commerce lobbied the McKinley Administration to make it easier for Chinese merchants to enter the U.S. San Francisco shipping and lumber magnate Robert Dollar led the first business delegation to China in 1910 at the urging of the Chinese Chamber of Commerce, “to create and increase the friendly feeling between China and the United States, and to increase our commerce.”

The Immigration Profile Changes

Beginning in the 1960s, several forces converged to weaken historic Chinese community institutions in the Bay Area:

- Relaxation of U.S. immigration laws in 1965 encouraged a wave of Hong Kong immigrants at the height of the Cultural Revolution, many of whom brought with them the skills and resources to open businesses, buy homes and assimilate into the larger Bay Area community.
- A changing sense of Chinese ethnic and cultural identity during the 1960s and 1970s separated Chinese-American youth further from the conservative Chinatown establishment and the immigrants it was set up to help.
- An influx of Mandarin-speaking Taiwanese immigrants in the 1970s caused deep cultural and political divisions, particularly over normalization of China relations.
- A growing Chinese-American professional class, and newly-arriving students, scientists and engineers, easily dispersed into the suburbs and city residential neighborhoods, with little connection to, or need for the services offered by, the benevolent associations and social service agencies.

Today the Bay Area's China connection is both far less monolithic and far more extensive than in the past. Commercial, charitable and cultural networks reaching back a century or more still figure prominently in the greater Chinese community, augmented by networks of alumni and trade associations, university endowments and growing political influence.

Making—and Breaking—the Banks

Chinese miners played a pivotal role in the early expansion of Wells Fargo & Co. from an express agent into banking. When the leading express agent handling gold shipments, Adams & Co., built new offices in downtown San Francisco with granite quarried in China, Chinese workers refused to work on the building. An architect brought specially from China by the company studied the markings on the granite blocks and explained the problem: The granite had been cut to favor placement on a different corner, in accordance with principles of *feng shui*.

Adams went forward with the project using non-Chinese labor. Once the building was completed, Chinese miners were convinced it was unlucky and refused to enter. Instead, they took their business down the street to a new upstart competitor, Wells Fargo. Wells thrived, eventually building its own headquarters at the same intersection, on the favored corner, opening with full Chinese ceremonies to ward off evil spirits.



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Indeed, Chinese “superstitions” proved well founded: Page, Bacon & Co., a Chicago-based bank with a branch that shared the Adams & Co. building, suspended operations in 1855 and the announcement prompted a run on all San Francisco banks that touched off the Panic of 1855. Some 200 San Francisco businesses went under including all but one of the city’s banks, Wells Fargo—thanks to the loyalty of Chinese customers.



2

New Networks Emerge

The Bay Area benefits from a unique structure of family, provincial, academic and professional networks within and among the various overseas Chinese communities. These mutually supportive links have grown out of successive waves of immigration, but reflect commonly held values about the importance of education; family and social hierarchy; professional advancement, and entrepreneurial initiative.

Even during the 61 years that the Exclusion Act was in effect in the U.S., from 1882–1943, the two-way flow of Chinese merchants, students and families permitted under the law continued and produced dynamic Chinese communities in Northern California. Chinese entrepreneurs prospered in farming, manufacturing, retail businesses, banking, hotels and property.

New arrivals to the U.S. were lured by the Bay Area's Chinese-speaking communities, Chinese-language newspapers, restaurants and stores. The Bay Area also offered opportunities to learn English and obtain a professional education well beyond what was available back home.

The same basic forces remain in play today, and in fact have accelerated since the 1960s. But the entrepreneurial connections are now more complex and sophisticated—involving business and professional associations; university alumni networks; greater China economic, trade and technology development offices; deal-focused venture firms, business incubators and angel investors; and advisors with China-connected banks, law firms and accountancies.

These networks—often overlapping with mutually supportive family and social networks—form a highly efficient system for developing contacts, pursuing business leads, structuring and financing new businesses, and accessing cross-border comparative advantage in knowledge, design and production. They emphasize collaboration and information-sharing rather than isolated action, business relationships rather than specific deals, and a willingness to assume greater risk spread across a group of trusted partners. In the process they generate jobs, business formation, technological innovation, tax revenues, personal wealth and philanthropic giving across the regional economy.

New School Ties

Education has long been a priority in Chinese society, and a preferred path of entry into the U.S. A new generation open to fresh ideas and methods, and fluent in the languages, business cus-

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toms and cultures of China and the U.S., enjoys a strong advantage in building on the comparative advantages both sides of the Pacific have to offer.

Post-1949 mainland China sent no students to the U.S. prior to 1979. By 1988 it was the leading country of origin for foreign students, and has held the number one or two position since then. The number of visiting Chinese students in the U.S. increased from 39,000 in 1994 to 62,500 in 2004–05, according to the Institute of International Education (IIE).

Large numbers of students from Taiwan enrolled in U.S. colleges and universities during the 1970s and 1980s, many receiving Taiwan government support in an effort to transfer technological know-how and strategically compete with the mainland. At the peak of this trend in 1987, some 38,000 Taiwanese students entered the U.S. The numbers have since declined to just under 26,000 in 2004–05. Enrollment by Hong Kong students peaked in 1993 with more than 14,000 students—as families weighed investment and citizenship options in the run-up to Hong Kong’s 1997 transition from British to Chinese rule. By 2004, that number had fallen by roughly half, to 7,300.

IIE reports that California hosted some 75,000 international students from all countries in AY 2004–05, the most recent year for which figures are available. About 13,600 students, or 18%, came from Greater China. The numbers of Chinese students enrolling in U.S. colleges and universities has, however, declined since 2002, due to:

- Real and perceived post-9/11 visa difficulties.
- Bursting of the tech bubble in 2000–01, which reduced investment and job opportunities.
- Curtailed foreign travel due to SARS, avian flu and 9/11 safety concerns.
- Improved quality of education, education incentives and job prospects in home countries.
- Competing university recruitment from the U.K., Canada and Australia.

It should be noted, comparatively, that nearly 19,000 California college and university students enrolled in study abroad programs during AY 2004/05, with 3,100 studying in greater China—a relatively small number but an increase over previous years.

A survey of major Northern California academic institutions done for this report (the University of California and California State University systems, Stanford University, University of San Francisco, Santa Clara University and Golden Gate University) shows more than 5,500 graduate and undergraduate students from mainland China, Taiwan and Hong Kong enrolled at Bay Area colleges and universities during AY 2004–05. Leading schools include UC Davis (1,318), San Francisco State University (1,288), San Jose State University (1,088) Stanford (737), UC Berkeley (608), and University of San Francisco (128). Leading fields of study include business and management; engineering; mathematics and computer science; economics; and physical and life sciences. *(Note: UC figures are from the UC Office of the President, which counts foreign students differently than some individual campuses, by including continuing students with permanent resident status.)*

With scholarships and other U.S. financial support covering 24% of their expenses, IIE estimates that the 75,032 international students and their families in California contributed an estimated \$2.01 billion to the state economy in tuition, housing, supplies, travel and other spending during AY 2004–05. Proportionate expenditures for the 5,554 Bay Area Chinese students—about 7.4%—would be on the order of \$148.7 million annually.

Foreign-born Chinese students are among the most active participants in global alumni networks maintained by area universities. Berkeley and Stanford have alumni chapters in the People's Republic of China (PRC), Taiwan and Hong Kong that are linked to broader alumni associations (and in Berkeley's case, to a separate Chinese Alumni Association). Both schools maintain distinct fundraising entities within the universities' development departments—the Berkeley/China International Association (BCIA) and the Stanford Office of Asian Relations (SOAR).

Maintaining close, on-the-ground ties such as these is critical to cultivating business and government contacts; facilitating academic and professional exchanges; connecting graduates with employers; matching alumni entrepreneurs and investors; and soliciting large scale donations and endowments. Specific university schools and departments—engineering, physics, information technology, management, law, medicine—frequently have their own visiting faculty and lecture programs with specific counterpart universities and research institutes throughout China.

Education and Business Intersect

UC Berkeley has perhaps the most extensive connections to China among Bay Area universities. Its Institute for East Asian Studies coordinates visiting scholars and overseas study, and includes a separate Center for Chinese Studies. The Institute, its East Asia library and Berkeley's Department of East Asian Languages and Cultures are being consolidated to form the Chang-Lin Tien Center for East Asian Studies, named for the late UC Chancellor and housed in a new \$52 million building to be completed in 2007. The Berkeley China Initiative brings together diverse resources from within the Berkeley community to strengthen research, and teaching about China, forge U.S.-Chinese partnerships, and engage the larger community. Programs have included working groups on energy in rural China, AIDS, labor, the environment, a conference on venture capital and private equity investing, climate change, and teaching the Chinese language.

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C.V. Starr East Asian Library and Chang-Lin Tien Center for East Asian Studies

Individual schools at Berkeley foster exchanges through separate initiatives. For example: Boalt Hall School of Law has pioneered U.S.-China legal exchange. In the mid-1980s Boalt brought Chinese lawyers and legal scholars to Berkeley to study, under the auspices of the Committee on Legal Educational Exchange with China, an effort funded by the Ford and Luce Foundations. China law scholar Stanley Lubman, now a visiting scholar at Berkeley's Center for Law and Society, visiting lecturer at Boalt, and adviser to the Asia Foundation on legal reform in China, played a leading role in those early exchanges. In 1986 Prof. Robert Berring and Boalt alumnus Bruce Quan arranged an early symposium on foreign investment law in China, involving judges from the Shanghai Higher People's Court and the Shanghai Foreign Investment Commission.

Boalt Hall has since organized reciprocal delegations and lectures focusing on foreign trade and investment, real estate and family law. It has also partnered with Peking University on a faculty exchange program, and has hosted judicial delegations, including a 1998 meeting of five judges from the Supreme People's Court of China with members of the California Supreme Court and participation of two Supreme People's Court judges in an international Judicial Civil Law Conference.

Berkeley's Haas School of Business has hosted a high-level annual Asia Business Conference since 1999. Haas' Clausen Center for International Business & Policy sponsors a two-week MBA program in Beijing and Shanghai. Haas, the College of Engineering and the School of Information Management & Systems jointly sponsor a Management of Technology China Fellows program that sends 8-10 graduate students to China for 10 days, as part of an intensive interdisciplinary course in technology management challenges for non-Chinese tech companies doing business in China. The program is in its fourth year.

Eleven schools, centers and programs at Berkeley in law, engineering, business and management, journalism, international and area studies, information management and Chinese studies support the Center for Research on Chinese & American Strategic Cooperation (CSC), a think tank established to foster U.S.-China economic and political collaboration. The Center has affiliate relationships with the Chinese Academy of Social Science's Center for WTO/International Eco-

conomic Law; the China National Science & Technology Law Society; and the PRC Consulate in San Francisco.

In addition to administering the Management of Technology Fellows program, CSC has hosted a May 2006 East Asia Corporate Governance conference; co-sponsored an April 2006 China venture capital forum in Shenzhen with the World Economic Forum and the China Venture Capital Research Institute; and sponsored a second, U.S.-China VC Conference in Shanghai in October 2006. In April 2006 the Center launched its latest effort, the five-year China Intellectual Property Rights Leadership Program. Beginning in October 2006 CSC has established a month-long program of in-class training, seminars and field study internships for a group of 20 Chinese judges, prosecutors, corporate managers, and local and central government policy makers in the area of intellectual property protection. The idea is to leverage Berkeley's extensive faculty connections in China (School of Information Management Systems dean AnnaLee Saxenian, School of Journalism dean Orville Schell and Center for Open Innovation executive director Henry Chesborough played leading roles) in building relationships, heightening awareness of IPR concerns and, over time, influencing legal and governmental reforms.

Chinese donors have given some \$53 million to UC Berkeley since 2000, according to the Berkeley China International Association, including:

- A \$1.5 million contribution toward the Tien Center from Silicon Valley businessman Saul Yeung and Lister Chang, a Hong Kong resident and Berkeley graduate who serves on the Berkeley Foundation Board of Trustees.
- A \$40 million gift from Hong Kong industrialist Li Ka Shing's foundation to help build the Li Ka Shing Center for Biomedical and Health Sciences; the Center, to be completed in 2009, will replace the Warren Hall School of Public Health and feature a brain imaging center and cancer, Alzheimer's, infectious disease and stem cell biology research facilities.

Additional past gifts include a professorship in electrical engineering and computer sciences endowed by Taiwan Semiconductor Manufacturing Co. (Dr. Chenming Hu, the current professor, was chief technology officer of TSMC from 2001–04, and founding chairman of Celestry Design Technologies); the Li Ka Shing Chair in Health Management at the Haas School of Business; the University Health Services Tang Center, built in 1993 with an initial \$5 million grant from the San Francisco-based Tang Foundation; and two-thirds of the \$40 million cost of Tan Kah Kee Hall, a chemical engineering research laboratory completed in 1997, covered by private funds from more than 2,000 donors, most of them overseas Chinese from Southeast Asia.

Stanford University's 737 Chinese students accounted for just over 9% of the Stanford student body of 8,092 in AY 2004–05. More than 70 faculty members are natives of greater China, and approximately 180 Chinese research scholars are on campus—roughly half of them post-doctoral researchers and the other half visiting scholars. Stanford's alumni network in Hong Kong, Taiwan and the PRC numbers nearly 1,300.

Stanford's Shorenstein Asia-Pacific Research Center (APARC) focuses on policy issues. Recent programs have included a Brent Scowcroft lecture on U.S.-China Relations, and seminars on

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human rights and on state power and globalization in China. APARC's Stanford Project on Regions of Innovation and Entrepreneurship (SPRIE) and the China Institute for Science and Technology Policy at Tsinghua University in Beijing held a May 2006 workshop on "Greater China's Innovative Capacity." SPRIE has in recent years hosted seminars on Taiwan/China tech sector globalization and production, globalization of integrated circuit development, and the future of China's semiconductor industry, and has also hosted visiting scholars from Taiwan's Industrial Technology Research Institute (ITRI).

The Center for East Asian Studies (CEAS) focuses on cultural studies and sponsors travel and research grants as well as foreign study and internship programs.

Stanford's Graduate School of Business (GSB) launched the Global Management Immersion Experience (GMIX) program in 1997 in China with 21 students placed in companies ranging from glass and cement manufacture to cable television. In 2004, 30 GMIX students were in China studying auto electronics, wireless communications and supply chain logistics. GSB hosted a 2005 China supply-chain logistics conference in Shanghai, in cooperation with the Hong Kong University of Science & Technology and Accenture. The GSB also utilizes an active alumni network in China to recruit MBA candidates for the University.

The U.S.-Asia Technology Management Center (U.S.-ATMC), part of Stanford's School of Engineering, sponsors lectures and seminars; faculty research projects; and development of courses and web site projects, that address technology trends and issues of mutual interest in the U.S. and Asia. The Center pursues a dual track in its annual lecture series, with separate lectures relating to technology management (wireless network businesses, cross-border partnering in Asia, broadband networks in Asia, high-tech entrepreneurship) and advanced technology research (nanoelectronics, advanced electronics systems integration, advanced sensing technologies and networks, photonics). U.S.-AMTC projects also link the university and industry, in the U.S. and Asia. Management seminars have hosted panels of Silicon Valley venture capitalists active in Asia, and executives such as Taiwan Semiconductor Chairman Morris Chang. While the U.S.-AMTC was initially focused on Japan, since 2000 it has broadened its focus to include East Asia, and China in particular.

The Stanford Center for International Development (SCID) was established in 1997. Since 1998 its China program has been managed by deputy director and former World Bank China program director, Dr. Nicholas Hope. The program emphasizes economic policy reform in China, and research results are disseminated in policy conferences at Stanford hosted by SCID; at Tsinghua University in Beijing, with financial support from Goldman Sachs (Asia); and at the Chinese University of Hong Kong in Hong Kong. The economics departments of the respective universities jointly host the conferences in China with SCID.

In June 2006, SCID's most recent policy conference had a pan-Asian emphasis, with most attention focusing on economic policy reform in China and India. Past conferences have covered such issues as China's approach to exchange rates, trade and investment, capital flows, antitrust policy, venture capital, enterprise reform, reform of agriculture and social services, and reform of the financial system with particular emphasis on banks. Participants have included senior officials

and academics from China and Hong Kong. An annual memorial lecture series commemorates a Stanford doctoral student and graduate of the People's Bank of China Graduate School, Huang Lian, and features distinguished China scholars speaking to socioeconomic issues in China. Similar commemorative events (for Kwoh-Ting Li and Kuo-Shu Liang) are planned jointly by SCID and the Friends of Stanford University Foundation-Taiwan. There is also an active program of Chinese visiting scholars at SCID (4–8 a year), including an arrangement with the Chinese Ministry of Finance to send four senior officials to SCID annually (two each for six months) to research policy issues.

The Stanford Center for Professional Development hosted a group of 33 mid-level Chinese government officials over the summer of 2006, for a three-month on campus and off-site public policy training program focusing on energy, the environment, local government and media. Stanford now plans to repeat the program annually.

Stanford's Asia-Pacific Student Entrepreneurship Society hosts an annual entrepreneurs' summit, now in its seventh year. The most recent, in April 2006, featured DragonVenture managing director Tony Luh, and PayPal co-founders Peter Thiel and Elon Musk. The student-organized Stanford Asia Technology Initiative, founded in 1999 and supported by university and tech industry advisors, has launched entrepreneurship programs in Shanghai, Hong Kong, Singapore, and Bangalore. Tokyo has organized student internships and seminars, and hosts an annual entrepreneurs' conference. The latest conference, in August 2006, was held in Shanghai's Zhangjiang High-Tech Park, and focused on intellectual property, energy and web development. Past events have featured presentations by the CEOs of Sina and Alibaba.com. The Forum for American/Chinese Exchange at Stanford (FACES) hosts conferences and reunions, and maintains a database in support of the university's Chinese alumni network. Technology & Education Connecting Cultures (TECC) is a student-organized program to bring computer, internet and English instruction, as well as teacher training, to rural communities in China through Summer Institute teaching programs, web-based course materials, donated books and computers and programs for minority and migrant children.

According to the Stanford Office of Asian Relations, foreign-born Chinese donors have contributed more than \$50 million over the years in gifts and endowments, with additional contributions from Chinese-American families and alumni. Most have been anonymous and have been in the form of fellowships and scholarships. Some examples:

- \$6.4 million from sources in Taiwan and the U.S. to establish four professorships in engineering, economic development, medicine and Chinese culture and history in the name of Kwoh-Ting Li, a former Economic Minister and Senior Advisor to the Taiwan government, who founded the Hsinchu Science-based Industrial Park.
- Three graduate fellowships, each \$300,000–400,000, from donors in Taiwan, Hong Kong and the PRC.
- Undergraduate scholarships ranging from \$250,000 to \$1 million each, from donors in Taiwan, Hong Kong and the U.S.
- A seven-figure donation from the Li Ka-Shing Foundation to the School of Medicine for medical research.

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- \$1 million each from Intel chairman Craig Barrett and from Taiwan Semiconductor Manufacturing Co. CEO Morris Chang, toward the newly renovated Stanford Nano-characterization Laboratory, a nanotech research facility enabling researchers to view and work with structures as small as two-tenths of billionth of a meter in the development of new generation semiconductors, fuel cells and materials.

UC Davis' academic emphases in agricultural, veterinary, public health and environmental sciences have lured significant numbers of foreign-born Chinese students. Many are enrolled, with Chinese government support, to study crop yields, resource management, agricultural economics, treatment of infestations and animal diseases, nutrition, public health and other fields. Davis has cooperative agreements with seven Chinese and two Taiwanese universities in agronomy, forestry, range science, biology and agricultural engineering.

Visiting scholar Yanfeng Chen, general manager of Southern China poultry producer Fujian Sunner Group Co., is part of the management team of the California Institute for Food & Agricultural Research (CIFAR) on the Davis campus. Fuzhou University in Fujian, and Zhejiang University in Hangzhou, are CIFAR international affiliates. CIFAR also partners with the Chinese Institute of Food Science and Technology (China IFT) and several Chinese universities to organize China's International Conference of Food Science and Technology (ICFST), last held in Guangzhou in November 2005, and the China Food Summit, next scheduled for Xiamen in the fall of 2006. CIFAR executive director Dr. Sharon Shoemaker, a biochemical engineer, serves on the scientific organizing committees for the ICFST. She is also an advisory board member for Shanghai's Jiaotong University's Bor S. Luh Food Safety Center, and for the Fuzhou Biotechnology Consultancy Group.

Part of the agenda during the November 2005 China visit of a Bay Area delegation led by San Francisco Mayor Gavin Newsom included signing of a faculty exchange/collaborative research agreement between UC's **California Institute for Quantitative Biomedical Research (QB3)** and Peking University's Center for Theoretical Biology. QB3 is an interdisciplinary effort that leverages the strengths of engineering and physical sciences at **UC Berkeley**, engineering and mathematical sciences at **UC Santa Cruz**, and the medical sciences at **UC San Francisco**, as well as strong biology programs at the three campuses and support from private industry. Peking University brings to the agreement strengths in theoretical biology and computational modeling of biological behavior. The Center of Excellence created by the two institutions aims to enhance the rate at which complex biological phenomena can be quantitatively predicted. Programs will include the exchange of students and faculty and joint symposia. The Center is aligned with a broader effort to strengthen UC-China relations called the "10+10 Alliance", that brings together the ten University of California Campuses with ten partner universities in China. ICSF currently has 224 visiting scholars and students from China.

Special academic ties exist between China and Jesuit educational institutions. Jesuit missionaries first landed in Macao during the 16th century, studied Chinese language and customs, and eventually reached Beijing. They served as consultants to the Imperial Court in astronomy, chemistry, physics, music and art, and even ran the Imperial observatory. In the late 19th and early 20th century, Jesuits taught English to Chinese immigrants and welcomed Chinese children in their

schools on the West Coast. Jesuit schools, libraries, observatories and churches can be found throughout China today, particularly in and around Shanghai.

The Jesuit-China connection in the Bay Area is most apparent at the **University of San Francisco** (as well as Santa Clara University). USF initiated a program of teacher exchanges that included bilingual instruction, shortly after normalization of U.S.-China relations in 1979. In 1988 the University established a Center for the Pacific Rim, hosting seminars, lectures and conferences on Asian politics, business and culture. The Center offers a 21-month evening degree program, the Masters of Arts in Pacific Rim Studies (MAPS), with studies focusing on Japan, Korea and China.

USF programs tend to explore social and cultural issues more than commerce with respect to China, although the Center for the Pacific Rim has hosted numerous programs on China's economy and business environment, and its advisory board members include Lam Research founder David Lam and ChinaVest chairman and CEO Robert Theleen.

USF established the Ricci Institute for Chinese-Western Cultural History in 1984, named after the 16th century Italian Jesuit missionary Matteo Ricci. The Institute houses a library and archives detailing the history of Christianity in China, and contacts with the West dating back to the late Ming dynasty. It has affiliate relationships with scholars at the Chinese Academy of Natural Sciences, Chinese Academy of Social Sciences, Chinese University of Hong Kong and the Beijing Center for Language and Culture, and has awarded scholarships to students at Beijing Capital Normal University, Central China Normal University, Xiamen University and Chinese University of Hong Kong.

Ricci's EDS-Stewart Chair for Chinese-Western Cultural History, Asian Scholarship Endowment and Malatesta Scholarship promote cross-cultural exchanges for visiting scholars, undergraduate USF students of Asian descent, and students in China. Affiliate Ricci Institutes are located in Taiwan, Macau and Paris. An International Program on Christianity in China sponsors study, exhibits and events in the U.S. and China.

Most recently, USF has developed a relationship with the China Venture Capital Research Institute and agreed to host a venture capital delegation from China that will visit San Francisco and Silicon Valley in late 2006.

San Francisco State University counts close to 90 Chinese-born and Chinese-American faculty members. SFSU has drawn on their expertise and connections to establish a new Center for U.S.-China Policy Studies within the College of Behavioral and Social Sciences (BSS). The Center's director, political science professor Dr. Sujian Guo, is president of the 400-member, nationwide Association of Chinese Political Studies (ACPS).

A CUSCPS delegation visited China in June 2006, participating in an international symposium at Renmin University of China in Beijing and meeting with international studies faculty at both Renmin and Peking University to discuss joint research projects and academic exchanges. Similar discussions were held in Shanghai at Tongji University, Fudan University and Shanghai Jiaotong University. Out of those talks has come a planned 2007 faculty exchange between BSS and

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Shanghai Jiaotong's School of International and Public Affairs, and two joint research agreements—one on sustainable rural development and “new countryside building” with the Central Party School, a think tank and training center for government leaders, and another with the Shanghai Institute of American Studies on changing U.S.-China relations. The Center also publishes a weekly summary of China political and economic news.

In February 2006, SFSU opened a branch of the Confucius Institute—one of four in the U.S. and 20 worldwide—in cooperation with China's National Office for teaching Chinese as a Foreign Language. Three colleges on the SFSU campus—Education, Humanities and Extended Learning—will work with the Institute to develop Chinese language instruction programs for teachers, K-12 and college curricula for teaching Chinese as a second or heritage language, and offering courses and programs on Chinese language and culture for non-diploma students, among other activities.

Alumni connections work both ways: **Beijing University, Tsinghua University, Nanjing University, Shanghai Jiaotong University, Fudan University, National Taiwan University, Tunghai University, National Chiao-Tung University** and others maintain active alumni association chapters in Northern California—combined membership for the latter two chapters is reportedly more than 2,500 alumni—to retain contacts with overseas graduates working in Silicon Valley.

Trade Associations Spell Opportunity

Alongside the university links is a parallel network of business and professional associations. They may be distinct to the PRC, Taiwan or Hong Kong; or to a profession, such as engineers, software designers or accountants. They may be purely social networking groups, promote trade and investment, facilitate cross-border networking and business incubation, or undertake policy research on U.S.-China relations and business issues affecting the Chinese-American community in the U.S. Some have links to government trade and investment promotion agencies. These groups serve as an informal infrastructure for trade, investment and business development.

Government offices from China, Taiwan and Hong Kong provide official anchors for expanding economic ties. It should be remembered that, until 1979, mainland China was not recognized by the U.S. Hong Kong and Macau were territorial possessions of Great Britain and Portugal until 1997 and 1999, respectively. Taiwan had diplomatic recognition as the government of China until 1979, but recognition was withdrawn in favor of a more neutral “one China” position when relations with the PRC were normalized. Contacts with Taiwan have since been conducted on an unofficial basis, through counterpart non-governmental organizations. Today, the PRC conducts official trade and investment promotion through its consulates. The **Chinese Consulate-General** (PRC) is located in San Francisco, and has actively worked through the local Consular Corps and with government agencies and non-profit business groups in hosting delegations and programs, and showcasing Chinese manufacturers, science and industrial parks and cities offering investment incentives.

Hong Kong and Taiwan have maintained networks of economic and trade development offices in major U.S. cities, including San Francisco, since the 1980s.

The **Hong Kong Economic & Trade Office** opened in 1986 in San Francisco. Two other offices are located in New York and Washington D.C. The HKETO is an arm of the Hong Kong Special Administrative Region that helps facilitate trade and investment, primarily with Hong Kong proper and, to a lesser extent, with Shenzhen and Guangdong Province in Southern China with Hong Kong as a gateway. It cooperates closely with the **Hong Kong Association of Northern California**, a separate business and social networking organization founded in 1984 that hosts programs and networking events for Hong Kong-related businesses and expatriates. The HKETO works closely with Hong Kong's Trade Development Council and its Invest HK investment promotion arm.

The **Taipei Economic & Cultural Office (TECO)** and **Taiwan Trade Center** in San Francisco serve as an unofficial consulate and commercial attaché office (its U.S. counterpart in Taiwan is the American Institute on Taiwan). The Economic & Cultural Office oversees cultural and protocol exchanges (quasi-official delegations, performances, museum exhibits, etc.), processes travel documents, and provides assistance to Taiwan nationals visiting the U.S., while the Trade Center handles two-way trade and investment promotion. The Trade Center is an extension of the Taiwan Trade Development Council in Taipei. Taiwan's Ministry of Science & Technology, which oversees technology parks and technology-based investment incentive programs, maintains a Silicon Valley office.

The Hong Kong business community served by HKETO and the Hong Kong Association remains heavily invested in the San Francisco property market and in its robust legal, financial and tourism service sectors, dating back nearly three decades. TECO not only performs its quasi-consular functions but also serves an older Bay Area Taiwanese community with longstanding Kuomintang loyalties. Since the 1980s, however, the economic center of gravity in the overseas Chinese community has shifted south, from San Francisco toward Silicon Valley.

A wave of engineering graduate students from Taiwan began arriving in Silicon Valley in the late 1960s and early 1970s. Many came with support from the Taiwan government, which was competing with the mainland for global recognition, and with Japan, Korea and Hong Kong to modernize its export industries and move its exports up the value chain from basic local manufactures—machinery, shoes, bicycles, rattan furniture—to higher end goods. Two oil shocks of the 1970s drove up manufacturing costs, adding to the economic pressure. The advent of semiconductors and personal computing offered an opportunity. Gold was about to be rediscovered in California.

Taiwan's First Generation of Engineers Learns to Improvise

Ta-Lin Hsu's family fled to Taiwan in 1949, at the time of the Communist takeover on the mainland. He recalls coming to the U.S. in the 1960s as part of a wave of Taiwanese engineering and science students encouraged to emigrate for graduate study after completing their military service. He had received his undergraduate degree in physics from National Taiwan University, a masters degree in electrophysics from the Polytechnic Institute of Brooklyn and finally, in 1970, a Ph.D. in electrical engineering from Berkeley.



Taiwanese students were drawn to the Bay Area for the weather and the local Chinatowns in San Francisco, Oakland, San Jose and Sacramento where language would be less of a problem. Entry into graduate schools was relatively easy: U.S. students had little interest in engineering or science, yet demand in those fields was high. Many Taiwanese students received financial aid from the universities and support from their government back home.

After completing graduate school, however—often with honors—Chinese students had few options. Corporate jobs were typically entry level, with a glass ceiling barring serious advancement. Returning to the university to teach was an option, but not a preferred one. The best chance to apply their knowledge was in the research labs of IBM, Xerox, General Motors, the Bell System or Kodak. Dr. Hsu himself went to work for IBM. Part of his research there involved technology that would turn up years later in the Apple iPod. He returned to Taiwan frequently, attending conferences of the Industrial Technology Research Institute (ITRI) and the Electronics Research and Service Organization (ERSO).

Taiwan's Minister of Economic Affairs, K.T. Li, had been charged with moving Taiwanese manufacturing upmarket into high-technology. It was a challenge: most existing Taiwanese manufacturing enterprises were small, low-skilled family-run operations. Li established Hsinchu Science-Based Industrial Park, initially as an electronics export processing zone, in 1980. But participation was slow to develop. One problem was

financing—banks were risk-averse, family-controlled businesses in Taiwan were reluctant to fund new ventures outside their comfort levels, and raising finance outside the extended family ran counter to Taiwanese business customs.

In the early 1980s Li convinced the Taiwan government to put up NT\$800 million in high-tech seed funding, aimed at a new generation of overseas entrepreneurs. The fund was quickly expanded to NT\$2.4 billion to meet demand. Taiwan computer manufacturer Acer Co. and the Continental Engineering Group, formed the first Taiwanese high-tech venture capital firm, Multiventure Investment, in 1984.

Li was by then talking to Silicon Valley contacts about setting up venture capital funds, in part to reverse the “brain drain” and draw promising startups (and new technologies) to Hsinchu. One such contact was Dr. Hsu, who had since left IBM to join one of Silicon Valley’s premier technology-based investment banking firms, Hambrecht & Quist. In 1986 Dr. Hsu formed H&Q Asia, a \$50 million fund with 51% of its money from Taiwanese industry and 49% from the government. Li also persuaded engineers Peter Liu and Lip-Bu Tan to form a second venture fund, Walden International Investment Group. Liu would later spin off a third venture firm, W.I Harper Group. H&Q Asia, Walden International and W.I. Harper remain among the premier venture capital investors in Taiwan and PRC tech industries.

Against this backdrop, Taiwanese engineers and scientists in Silicon Valley had begun exploring entrepreneurial opportunities in light of the glass ceiling they had encountered in many areas of their work. In their growing numbers they had also begun to cross paths socially and professionally, in a suburban industrial park environment that many recent immigrants found isolating. They began to network.

A New Network Model

To an unusual degree, the Chinese-American business community has promoted the development of trade and investment not through official government programs but through education, assimilation and networking.

Some of these associations are broad-based. The **Asian Business League of San Francisco (ABL-SF)**, founded in 1980, was the first non-profit organization in California to focus its attention on Asian trade and business promotion. Its membership has become more diverse over

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the years, although it remains predominantly Chinese. Through seminars, conferences and social gatherings, ABL-SF works to help members develop and enhance leadership and management skills; meet and pursue new business opportunities; advocate on issues important to Asian Americans; and learn about economic and market trends locally and internationally. ABL-SF hosts two large annual events, an awards dinner focusing on Asian American community leadership and achievement, and a Lunar New Year celebration. In 1999 the group established a mentorship program for high school students. A separate Asian Business League chapter was established independently in Silicon Valley in 1983.

Other Asian networks have a distinctly national or professional focus. AnnaLee Saxenian, Dean of the School of Information Management Systems (SIMS) at UC Berkeley, has done extensive research since 1994 on Chinese and Indian immigrant professional networks in Silicon Valley. In a 1999 study, “Silicon Valley’s New Immigrant Entrepreneurs,” published by the Public Policy Institute of California, Saxenian details—through interviews with founding members—the origins of the **Chinese Institute of Engineers (CIE)** in 1979, and the **Asian-American Manufacturers Association** (now the Asian-American MultiTechnology Association) in 1980.

CIE dates back to 1917, formed by a group of engineering graduates in the U.S. who had worked for the railroad and other industries. In 1953, CIE-USA was established as a separate organization in New York, with chapters nationwide formed beginning in 1977.

From 40 members in 1979, the Bay Area chapter now has more than 900. Among its initial members were Lam Research founder David Lam, Recortec founder Lester Lee and eOn Communications chairman David Lee. Lester Lee, Ta-Lin Hsu and W.I. Harper founder Peter Liu are on CIE’s advisory board today.

CIE is, at its heart, a technical society. Establishment of a Bay Area chapter enabled members with shared backgrounds an opportunity to connect socially and arrange events based on shared professional interests. Specifically it was an alternative to the established, Cantonese-speaking benevolent and business associations in San Francisco. AAMA was formed soon afterward, in 1980, by a small group of Chinese engineers at Recortec. It has grown from 21 members at its first meeting to more than 1,100 today, representing some 800 companies. It had a more ambitious mission, to:

- Foster business growth and networking
- Facilitate Pacific Rim business
- Facilitate management and leadership development
- Highlight the achievements of Asian-Americans

CIE and AAMA grew dramatically during the 1980s, with networking events—after-work mixers, golf tournaments, job fairs, business development workshops and industry seminars—that mixed business and social contacts. AAMA remains a leading transpacific professional organization through its annual Connect Conference, bringing Silicon Valley and Asia-Pacific technology professionals and venture investors together; an ongoing VC/entrepreneur program; a monthly speaker series; and AAMA chapters in Beijing and Shanghai.

Since the mid-1980s, Silicon Valley's ethnic Chinese tech community has seen a proliferation of new, more specialized associations, among them:

Electro-Optics Association (1985)

Chinese Software Professionals Association (1988)

Silicon Valley Chinese-American Computer Association (1988)

Silicon Valley Chinese Engineers Association (1989)

Chinese American Semiconductor Professionals Association (1991)

North America Taiwan Engineers Association (1991)

Chinese Information and Networking Association (1992)

Chinese-American Information Storage Society (1995)

CNetwork (1996)

Chinese Internet Technology Association (1996)

North America Chinese Semiconductor Association (1996)

Chinese Enterprise Association (1997)

Silicon Valley Science and Technology Association (2000)

Silicon Valley-China Wireless Technology Association (2000)

Silicon Valley Information Business Alliance (2001)

Tech Venture Business Network (2002)

Some groups have parallel functions, serving memberships from different parts of greater China. For example, the North America Chinese Semiconductor Association serves mainland engineers, while the Chinese American Semiconductor Professionals Association serves Taiwanese engineers. The Silicon Valley Chinese Engineers Association has a mainland focus, while the North America Taiwan Engineers Association emphasizes Taiwan.

The Rise of Transnational Clusters

By the late 1980s, Taiwan held some \$75 billion in foreign exchange reserves, partly the result of running large trade surpluses with the U.S. Those reserves were plowed back into the tech sector, mainly semiconductors and computers, through increased funding support for Hsinchu Park and for the Industry and Technology Research Institute (ITRI).

Acer, Mitac and other Taiwanese firms had come to dominate the original equipment manufacturing (OEM) segment of the computer hardware and peripherals markets. ITRI, with a \$5 billion annual budget from the government, had spun off United Manufacturing Co. in 1980 and Taiwan Semiconductor Manufacturing Co. in 1986—two of the world's leading chip foundries. These, and a number of small startup companies, had all located along a 50-mile corridor between Taipei and Hsinchu Science-based Industrial Park.

Taiwan's fragmented but dynamic market of small, entrepreneurial manufacturers and suppliers didn't lend themselves to the government's initial vision—building global companies. But

Taiwan's culture of risk-taking, seeded by government funding, meshed very well with the emerging culture of Silicon Valley. A new, more interesting strategy began to take shape: If Taiwan were the OEM focal point for computer and electronics hardware and semiconductors, and if it could attract engineering graduates in Silicon Valley to participate in ongoing technical exchanges with Taiwanese counterparts and develop niche applications, it could advance to new technological levels. Furthermore, by remaining a global supplier and not a global brand competitor, Taiwan could transfer technology, add value and prosper without inviting the trade disputes plaguing Japan and Korea at the time.

As Saxenian puts it in her 2000 paper, "The Silicon Valley-Hsinchu Connection: Technical Communities and Industrial Upgrading":

"The social structure of a technical community thus appears central to the organization of production at the global as well as the local level. In the old industrial model, the technical community was primarily inside of the corporation. The firm was seen as the privileged organizational form for the creation and internal transfer of knowledge, particularly technological know-how that is difficult to codify. In regions like Silicon Valley, where the technical community transcends firm boundaries, however, such tacit knowledge is often transferred through informal communications or inter-firm movement of individuals. This suggests that the multinational corporation may no longer be the advantaged or preferred vehicle for transferring organization knowledge or personnel across national borders. Transnational communities provide an alternative, and potentially more flexible and responsive mechanism for long-distance transfer of skill and know-how—particularly between very different cultures and environments."

Thus, the emergence during the late 1980s of so-called "astronauts"—overseas Chinese engineers, managers, finance professionals and others who, in a near constant state of air travel across the Pacific, are developing new technological applications and advising and starting businesses.

The **Monte Jade Science and Technology Association**, established in 1989 with Taiwan government support, is a networking association intended to "promote the cooperation and mutual flow of technology and investment" between Taiwan and the U.S., and provide "an opportunity for professionals and corporations on both sides of the Pacific to network and share valuable experiences in investment, opportunities, management, technology and business information exchange." Monte Jade West, the Silicon Valley chapter, boasts 1,200 individual and 180 corporate members.

Monte Jade, begun as an umbrella association of and for Taiwanese tech professionals, held its early meetings in Mandarin and was intended to provide a purely Taiwanese framework for assembling clusters of engineering talent, financing and management capability. Its mission has since broadened, reflecting the migration of Taiwanese tech manufacturing firms to the PRC and the emerging "triangle" structure of many new tech startups—with research and development

(R&D) innovation and patents in Silicon Valley, design and marketing in Taiwan and basic manufacture and packaging in China.

A Monte Jade Asian American chapter (MJAA caters to young Asian American professionals, with an annual executive mentorship program and an Annual High-Tech Study Tour to Asia. Monte Jade also hosts a New Leaders Forum with presentations from young tech managers and entrepreneurs. The Association now has 12 U.S. chapters including MJAA, and one each in Taiwan, Hong Kong and Canada.

This model—a convening organization that links engineers, managers and investors to government and business contacts and low-cost production resources—creates a powerful business development tool. A wireless telecommunications systems specialist and a chip designer, for example, might meet at a monthly association dinner, discuss an interesting technical problem at work and devise a possible solution; run the idea past two or three industry “elders”—typically former engineers now angel investors, venture fund managers or business advisors—who might help build a startup team and connect them with R&D, design, marketing and contract manufacturing support in Taiwan and the PRC; use angel and alumni contacts to arrange low-cost offices and shared lab facilities at Hsinchu or at Zhangjiang Park in Shanghai; and set up an off-shore corporate entity for favorable tax treatment and intellectual property protection.

Saxenian’s research suggests that Chinese-run tech startups, many of them initiated in this manner, accounted for \$16.8 billion in annual sales and nearly 42,000 jobs in 1998, at the height of the Silicon Valley boom, accounting for 17% of Silicon Valley businesses. Tech ventures owned and managed by Chinese nationals are now believed to represent more than 20% of Silicon Valley firms.

Monte Jade’s structure and mission have been replicated in two organizations, the **Hua Yuan Science and Technology Association (HYSTA)** and **Hong Kong-SV.com**, both formed in 1999. These groups aim, in the same way, to harness the skills and energies of mainland China and Hong Kong engineers, entrepreneurs and managers in Silicon Valley and re-connect them to academic, government and business incubation opportunities back home.

China saw a sizable brain drain of science and engineering graduate students after easing restrictions on overseas study in 1989. Residual feelings from the Tiananmen Square protests, along with scarce employment or entrepreneurial opportunities, discouraged returnees during much of the 1990s. Some 28,000 mainland Chinese students received doctoral science and engineering degrees in the U.S. between 1985 and 2000, according to a National Science Foundation study. The study also found that 88% of Chinese graduates receiving doctoral degrees in 1990–91 were still working in the U.S. in 1995, and that nearly 21,000 mainland Chinese nationals received H-1B visas during 1990–99, largely reflecting graduates sponsored by employers and staying on in the U.S. to work.

The opening of China’s economy and markets leading to WTO membership, rapid growth in mobile communications and the Internet, and incentives put in place by the government to lure technical graduates back home (such as funding for graduate research and visiting scholars,

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development of returning student science parks, and sponsorship of tech sector conferences and delegations) have together served to reverse this trend since 1999.

A final, key component: In 2000, the Silicon Valley tech bubble burst, closing software and Internet startup companies and redirecting venture capital sources. Opportunities did not dry up in Asia, however, where markets for personal mobile communications, the Internet and enterprise applications were exploding. And venture investment dollars could go farther in China, in terms of taking new ideas to market.

HYSTA does for mainland PRC graduates and professionals in Silicon Valley what Monte Jade does for native Taiwanese. It claims more than 2,000 members and its first annual conference in 2002—“Opportunities and Challenges: Riding the China Wave”—attracted 1,500 attendees. A May 2005 invitation-only U.S.-China IT Executive Summit in Pebble Beach featured presentations by Cisco Systems president and CEO John Chambers and Yahoo! co-founder Jerry Yang. It was at the Pebble Beach event that Yang and Alibaba.com chairman Yun (Jack) Ma agreed in concept on Yahoo!’s \$1 billion investment in Alibaba, and turning over operational control of Yahoo! to Alibaba in China.

In addition to its major conferences, HYSTA has an invitation-only Executive Club that provides networking opportunities for Chinese-born senior-level executives and established entrepreneurs. Its Venture Capital Group is a forum for networking and information-sharing that connects businesses and entrepreneurs with venture investors. An Emerging Leaders Forum offers management and leadership training and programs for young professionals, and a Distinguished Speaker Series features seminars by business leaders, scholars and government officials on China-related issues. Frequent programs also feature executives sharing their business and personal career experiences as mentors. HYSTA has ties to many of the approximately 80 PRC science parks such as Zhangjiang, Suzhou and Haidian (Zhongguangcun), and has established a Beijing chapter.

HYSTA has gradually shifted its emphasis from entrepreneurship and startup incubation to innovation and leadership, the theme of its 2006 Annual Conference. This transformation reflects strong demand throughout China for bicultural managers who understand Chinese business culture and practices and can also navigate the complex global corporate governance, tax, regulatory compliance and standards landscape.

Hong Kong Seeks Its Role

With the handover of Hong Kong from Great Britain to China in 1997, it was assumed at the time that the new Special Administrative Region (SAR), with its legal system based on British law, the widespread use of English in conducting business, and an advanced financial and logistics infrastructure, would provide an essential “gateway” to China. Instead, the 1997 Asian economic crisis, which began as a currency meltdown in Thailand, Indonesia, Taiwan and Korea, began to steer investment directly toward China—the region’s lowest-cost producer with a currency pegged to the dollar. Opening of China’s coastal areas to private economic development and foreign investment facilitated the process and widened the range of investment opportunities.

Hong Kong’s gateway status in 1997 particularly relied on Guangdong Province and the Pearl River Delta remaining the commercial center of gravity in the PRC. But the rapid development of Shanghai as a trade and technology hub—due in large part to Taiwan, which by 2001 had located some 8,000 companies and more than 250,000 nationals in and around Shanghai—forced a change in the SAR’s economic development strategy.

The Closer Economic Partnership Arrangement (CEPA), a 2003 free trade agreement that eliminates PRC tariffs on all Hong Kong origin goods by January 2006 and offers Hong Kong service firms preferential access to mainland markets, retains Hong Kong’s earlier geographic advantages as a two-way gateway, for international firms accessing Southern China and mainland firms taking their products and services global. Hong Kong further differentiates itself by pointing to its independent judicial system based on British common law with proceedings in English; more extensive legal protections for intellectual property, a fully convertible currency, privately-owned banks and transparent capital markets.

Through its Innovation and Technology Commission (ITC), formed in 2000, Hong Kong has committed HK\$5 billion toward funding the Hong Kong Science and Technology Park, Applied Science and Technology Research Institute (ASTRI), the



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Cyberport information technology cluster/incubator facility, a Design Centre and its related Innovation Centre cluster/incubator. ITC has so far opened five R&D centers—of nine planned—in information/communications, textiles and clothing, nanotechnology and advanced materials, logistics and supply chain management, and automotive parts and accessories.

Commissioner of Innovation and Technology Anthony Wong told an October 2005 Hong Kong/Guangdong trade and investment conference in San Francisco that the government's strategy is to build a "service platform" in Hong Kong that will, utilizing the benefits under CEPA, provide technology and design support to the basic manufacturing taking place across the border in the Pearl River Delta's 18,000 factories, employing some 12 million workers. A joint mainland/Hong Kong committee guides the ITC in tailoring its facilities and programs to the needs of Southern China manufacturers.

Even as its status as the indispensable gateway to China as dimmed, Hong Kong continues to serve as a major financial services hub for China and the larger Asia Pacific region, with the Hong Kong Stock Exchange playing a particularly important role in Asian and Chinese capital markets. Apart from the particular access that it provides to the growing industrial cluster in the Pearl River Delta, Hong Kong also remains a significant regional base for overseas companies wishing to establish a China presence but mitigate the risks still associated with doing business on the mainland.

Hong Kong-SV.com was established by a group of Hong Kong expatriates in Silicon Valley, with support from the Hong Kong government. Like Monte Jade and Hua Yuan, it is specifically intended to maintain open channels of communication between Hong Kong business and government leaders and Hong Kong-born Silicon Valley entrepreneurs. The objective is to highlight tech development activities and business opportunities in Silicon Valley and Hong Kong, and facilitate networking and collaboration.

Monte Jade, Hua Yuan and Hong Kong-SV.com have branches or chapters in their home countries, but so too, now, do some of the specialized professional organizations, as collaboration within and among industry sectors and countries has grown. Even more interesting, organizations that may have started out with a Taiwan or PRC focus have opened or are considering branch chapters on both sides of the Taiwan Straits. For example, the Chinese-American Semiconductor Professionals Association (CASPA) now lists Pearl River Delta, Shanghai, Taiwan/Hsinchu and Singapore chapters.

In recent years, social and professional divisions among the various overseas Chinese communities and organizations have begun to blur somewhat. Hua Yuan, Monte Jade and AAMA partnered to host large networking mixers. Core memberships and activities, however, remain separate and, to an extent, competitive. A group of younger professionals formed in 2000, **Asia-SiliconValley Connection** (ASVC), has a multicultural membership and partnerships with other organizations to leverage resources and avoid redundant programs and activities. ASVC holds Insight Conferences on emerging tech trends in Asia such as real estate, life sciences, and outsourcing in Asia. Its Venture Mentor Program connects new entrepreneurs with senior ASVC advisors and charter members, Entrepreneur Workshops offer interactive how-to support, and an annual “Gong Show” offers 10 entrepreneurs a chance to pitch their business plans to a venture capital panel before an audience. ASVC has also hosted networking events and partnered with SRI, AAMA, HYSTA, China investment research firm Zero2IPO and others on a range of topics such as biotech, contract manufacturing and private equity.

Saxenian’s research suggests a community of some 6,000 Chinese professionals in these various Silicon Valley associations, with probably 2,000 more in the broader-based regional organizations such as the Asian Business League and the **California-Asia Business Council (Cal-Asia)**.

Cal-Asia grew out of the California-Southeast Asia Business Council, which was launched in the early 1990s. In 2000 its focus on industry sector trends and economic policy was extended to include China as well as Southeast Asia. Cal-Asia hosts senior-level briefings from government and business leaders, hosts visiting Asian delegations, and has partnered with local organizations on China programs covering legal reform, banking, online gaming and Hong Kong’s film industry. In 2006 the Council organized a briefing and networking reception for a Chinese delegation of senior bank executives and regulators, and a program on green development opportunities in Asia. It also hosted a Tianjin Municipal Government urban planning briefing, and two programs on China’s financial sector.

The Northern California office of the **Asia Society** also sponsors both large and small programs focused on issues in Asia, and China in particular.

The importance of these informal networks cannot be overstated in terms of the sharing of ideas and information, horizontally among sectors and vertically among professions within a sector; technology cross-pollination; business and regulatory intelligence gathering; team building to launch new enterprises; and mentoring new generations of entrepreneurs.

Community and Policy: The Many Layers of U.S.-China Relations

Political involvement within the Chinese community has been reluctant at best, relative to other ethnic communities in the U.S. The tremendous degree of economic success and assimilation seen in the past two decades, however, and China’s emergence as a global economic and strategic power, have since prompted greater engagement.

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Dr. George Koo is optimistic about U.S.-China relations, given the two countries' influence in the world, the size and interdependence of their economies, and their common strategic interests in many areas. He recalls an early first trip to China in 1979, just after normalization. He needed a travel permit to leave Beijing. When he went out for a walk he was followed by a government handler. In a dilapidated hotel, he tried to set up appointments, but an antiquated phone system had a permanent busy signal during the first hour of the day because all offices opened at the same time, at 8:30. He could not deal directly with companies but instead was required to work through import-export intermediaries.

Things have changed significantly since then. But he repeats the oft-quoted saying, "Everything is possible in China; nothing is easy," and he sees constant potential for commercial, political and strategic misunderstanding.

Dr. Koo, who is currently director of the Chinese Services Group at Deloitte & Touche, was recruited in 1978 from SRI International (formerly Stanford Research Institute) to do cross-border consulting for Chase Manhattan Bank's Chase Pacific Trade Advisors—specifically, to help client firms enter the China market. He later founded Bear Stearns China Trade Advisors and worked with H&Q Technology Partners, then an affiliate of Hambrecht & Quist, before moving to Deloitte. Dr. Koo is currently on the board of Pacific News Service and served through April 2006 as vice chair of the **Committee of 100** (C-100), a nationwide group of Chinese-American business, arts and community leaders (architect I.M. Pei and cellist Yo-Yo Ma are among the founders).

C-100 was formed in 1990 to foster positive U.S.-China relations through communication and exchanges, and to enhance the image, visibility and participation of Chinese Americans within the U.S. It has commissioned nationwide surveys on American perceptions and attitudes regarding China; arranged high-level meetings with national leaders in Washington, China, Hong Kong and Taiwan; sponsored business and cultural delegations; pushed to expand classroom teaching about Asian-Americans and Asian history and culture; promoted PBS, Learning Channel and Discovery Channel documentaries on China; publicly supported Dr. Wen Ho Lee against federal spy charges; and actively lobbied U.S. policymakers on issues related to trade, industry outsourcing and globalization. In February 2004 it opened a "greater China" office in Hong Kong, and hosted its first annual greater China conference in January 2005—a companion event to its annual U.S. conference. In 2005 C-100 launched a national mentorship program for university students and young adults.

The Bay Area has one of the largest concentrations of C-100 members in the U.S. Dr. Koo believes that the region enjoys a strong competitive advantage in terms of technological cooperation with greater China: "Silicon Valley is unique. It's multicultural and multiethnic in a way that isn't comparable in Seattle or Boston. There's also a far greater acceptance of failure; venture capitalists will always give you credit for having tried and failed."

But he shares the concern of many C-100 members, that protectionist political debates over China's perceived trade advantage in wages and exchange rates mask deeper problems in the U.S. economy that erode U.S. competitiveness. Among these are unsustainably high deficits, low

savings rates and inadequate focus on education (65,000 U.S. high school student entries competed for the Intel Science Prize in 2004 vs. 6 million from Chinese students). A post-9/11 security clampdown on student and work visas further threatens the two-way flow of well-educated, highly skilled workers across the Pacific.

The **1990 Institute** is another senior-level, policy-focused organization with a different approach. It was formed by Unison Group Chairman C.B. Sung, along with former U.S. Undersecretary of State Philip Habib; T.Y. Lin International chairman T.Y. Lin; Johns Hopkins University president Steven Muller; Federal Reserve Bank of San Francisco president Robert Parry; Institute of East Asian Studies, UC Berkeley director Robert Scalapino, and Princeton University president Harold T. Shapiro. The Institute sponsors studies and conferences, and promotes exchanges between research scholars in the U.S. and China. It was established to provide independent policy-based research in the U.S., focusing on economic and social development and aimed at assisting China with modernization.

Toward that end the Institute has sponsored conferences and received visiting delegations from China in areas ranging from banking reform to commercial law to state owned enterprise governance to women and sustainable development. In 1993 it presented a comprehensive proposal for reforming China's economy to then- President Jiang Zemin. Subsequent publications have covered banking reform, agriculture, taxation and foreign business law.

Institute president Hang-Sheng Cheng was born in China, came to the U.S. in 1948 as an undergraduate, and worked as an economist with the International Monetary Fund before attending Princeton University and receiving a Ph.D. in 1963. He taught at Iowa State University in the 1960s, then moved to San Francisco in 1973 to work for the Federal Reserve Bank and, after retiring in 1992, joined the Burlingame-based Institute.

Dr. Cheng's concerns about China, reflected in the Institute's work, involve the long-term growth constraints to China's economy: A government structure of some 60 ministries with no formal budgets, accounting or rules and unreliable financial reporting; inadequate tax revenue collections in the provinces; unfunded central government mandates for everything from schools to health and pension benefits to road construction to enforcement of the "one-child" population control policy; and a political unwillingness to close down failing state-owned enterprises, in hope of managing rural migration to China's large cities. He too is worried that the U.S. is paying undue attention to low wages and exchange rates in China, and not enough to high public spending and low private saving at home.

Over 15 years, C-100 and the 1990 Institute have obtained unprecedented access to the highest levels of business and government, in Washington and in greater China. They have done this with a message that is pragmatic, not political. But the gap in world views from either side of the Pacific is wide, and both groups have no illusions about the work remaining to be done.

Taking a different approach to issues in U.S.-China relations, the San Francisco-based **Dui Hua Foundation**, led by John Kamm, has carved out a leading position as an advocate for political prisoners in China. Dui Hua, which means "dialogue," was founded in 1999. It works with

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government officials in Washington, embassies and consulates in China, foreign governments, human rights and other non-governmental organizations to keep international attention focused on specific political prisoners and secure their release. In 2004 Kamm received the MacArthur Foundation prize for his work. In February 2005, Dui Hua was granted special consultative status by the Economic and Social Council of the United Nations. It is to date the only independent overseas organization focused on questions of human rights in China to have received such status.

Operating on yet another level, the San Francisco-based **Asia Foundation** has for more than 25 years provided a non-governmental bridge to China that has supported its transition toward the rule of law from what has historically been an administratively controlled society. The Foundation opened its Hong Kong office in 1979, and its Beijing office is technically treated by the government there as a branch of Hong Kong. Its principal focus is on administrative law, legal aid and non-governmental organization (NGO) development, with funding from the U.S. Department of Labor, the Department of State, the U.S. Agency for International Development, corporations and the Chinese government itself.

The Foundation currently works in China on labor rights, under a U.S. Department of Labor contract, and works with the Ministry of Justice on a range of legal programs, including a legal aid project that allows citizens to sue the government. Working with the China State Council's Office of Legal Affairs, it has developed an administrative training program to support bringing Chinese law into compliance with its World Trade Organization obligations. Programs of this kind are important to investors, because they contribute to legal predictability and help to make China's system less arbitrary. China is also the largest recipient of the Foundation's Books for Asia program, under which 600 Chinese universities receive 300,000 new university textbooks donated by publishers each year; China's Ministry of Education covers local costs and ocean freight to Shanghai.

The Asian Art Museum Builds a Cultural Bridge

The Asian Art Museum of San Francisco hosts the world's largest collection on Chinese Art outside China, second only to the National Palace Museum in Taipei. Nine thousand of its 16,000 objects are Chinese, principally jades, porcelains and bronzes.

San Francisco voters approved a bond measure in 1960 to build a museum facility to house the renowned Asian art collection of Chicago millionaire Avery Brundage. The Brundage wing of the M.H. DeYoung Memorial Museum opened in San Francisco's Golden Gate Park in 1966.

In 1975 the museum presented the first major international exhibition to travel outside of China since the end of World War



New Networks Emerge

Two, featuring archaeological pieces. The exhibition drew 800,000 visitors in an eight-week period. A 1983 exhibit, "Treasures of the Shanghai Museum: 6,000 Years of Chinese Art," was the first exhibition organized with a museum in China and was initiated through the San Francisco-Shanghai sister city relationship. In 1994 the museum hosted an exhibit of the famous terra cotta warriors excavated from the tomb of China's first emperor in Xi'an.

By the 1990s the museum's collection and exhibitions had expanded, outgrowing the original DeYoung quarters. Beginning with a \$15 million leadership gift from Silicon Valley entrepreneur Chong-Moon Lee and a 1994 bond issue, plans took shape to renovate the old Main Library building in Civic Center. A new, three-story Asian Art Museum opened in 2003. Today the Asian Art Museum, under the leadership of director Emily Sano, is expanding its educational programs and adding cultural events and a new focus on contemporary artists in Asia, including younger artists from China.

Representing this new direction, in 2006 the museum hosted an exhibition of large-scale landscape paintings of Three Gorges dam, a controversial project to dam central China's Yangtze River, by Liu Xiaodong. By extending the U.S. exchange with China from the political and economic to the cultural realm, the Asian Art Museum is making an important contribution to Americans' understanding of China.

Personal and small business ties add richness and (sometimes literally) flavor to the Bay Area-China connection, in ways that are diverse and too extensive to document. Ex-San Franciscan William Wu, who now lives in Luzhi, outside of Shanghai, is a longtime member of the San Francisco-Shanghai Sister City Committee and a former executive director of the Chinese Cultural Center of San Francisco. Wu has actively promoted development of a traditional Chinese garden in the City. The project has the backing of the San Francisco-Shanghai Sister City Committee and the City of Shanghai, which would provide the labor and materials; the City of San Francisco would contribute land and maintenance. If built, the garden would bring both Bay Area residents and visitors a rare outdoor manifestation of a unique form of Chinese culture.

While the Chinese population of the Bay Area has long since dispersed throughout the region, San Francisco's Chinatown remains a gravitational center for the Chinese community, particularly the large numbers of Cantonese speaking Chinese Americans and immigrants with roots in Guangzhou Province. The **Chinese Cultural Center**, across the street from Portsmouth Square,

Ties That Bind

was established in 1965 to promote understanding and appreciation of Chinese and Chinese-American culture in the U.S. The center has staged Chinese opera, offered Chinese language classes, led Chinatown walking tours, held Chinese chess workshops, and hosted lectures and art exhibitions. Each year the center organizes an “In Search of Roots” program that sends young Chinese-Americans to their ancestral villages and cities in Guangzhou Province.

Food is another bridge. Just as leading San Francisco chefs have staked claims to the restaurant scene in growing urban centers like Las Vegas, Bay Area restaurateurs are eyeing the burgeoning restaurant scene in China. One of the most visible is George Chen, proprietor of **Shanghai 1930** and **Betelnut** in San Francisco, who in 2006 opened **Shikumen Bistro** in Shanghai’s fashionable Xintiandi district, with a move planned shortly to a new restaurant, the **Hamilton Club**, in a 1931 art deco landmark on Shanghai’s famous Bund. In Southern China, Bill Lee, owner of Chinatown’s **Far East Café**, opened in 2005 a 1000 seat restaurant and 700 seat employee cafeteria at Guangzhou’s international airport. There are formidable challenges to operating enterprises such as restaurants in China’s complex environment, but Bay Area food entrepreneurs are seizing the opportunity.

Sister Cities: Thinking Globally, Acting Locally

President Dwight D. Eisenhower established a national sister city initiative in 1956, as a way for U.S. citizens and foreign nationals to meet and learn firsthand about each others’ cultures and traditions at a local, more personal level. Administered by a global organization, Sister Cities International (SCI), the program was until recently exclusively cultural and educational, although sister city ties have often been initiated by business interests in one or both cities.

Cities are allowed only one sister city relationship with a given country, but multiple “friendship cities,” which are afforded many of the same benefits. Visitors entering the U.S. for a sister city visit have an easier time obtaining visas.

Ten Bay Area localities have sister city relationships with cities in greater China:

Berkeley	—	Haidian District, Beijing
Davis	—	Wuxi, China
Los Altos	—	Shin Lin District, Taiwan
Milpitas	—	Huizhou, China
Oakland	—	Dalian, China
Redwood City	—	Zhuhai, China
Richmond	—	Zhoushan, China
San Francisco	—	Shanghai, China; Taipei, Taiwan
San Jose	—	Tainan, Taiwan
Watsonville	—	Pinghu, China

New Networks Emerge

All of the above ties have different histories, structures and activities, and reflect different strategic objectives. Some are privately supported by citizen committees, funded by businesses and cultural institutions. Others are run as official city economic development and protocol efforts. Some act only as a point of contact for visiting businesspeople or government officials, on an as needed basis, while some are limited to occasional exchanges of students, musicians, theater groups and art exhibitions. Still others involve ongoing programs of visiting scholars, professional exchanges of doctors or lawyers, academic and government internships, gifts of public art and two-way hosting of business delegations.

San Francisco has two of the oldest sister city relationships in the U.S. It has been a sister city to Taipei since 1970, and formed the first U.S.-mainland China sister city program, with Shanghai, in 1979. The San Francisco-Shanghai Sister City Committee was established under the mayoral administration of Dianne Feinstein. Shanghai was chosen for its parallels with San Francisco as a port city and a financial center, following a business mission there led by Feinstein.

In its first 15 years, the committee participated in 150 exchanges, including reciprocal delegations of doctors, lawyers and judges, as well as theatrical and ballet companies; training of Chinese management interns in leading San Francisco-based corporations (7–8 classes have visited San Francisco, and the first San Francisco group is set to visit Shanghai next year); and technical exchanges involving airport and port development, hospitals and security. The committee organized a massive Shanghai Week celebration in 1995 that included business seminars, snow leopards from the Shanghai Zoo and Shanghai's National Music Orchestra. In 1999 it sent thousands of donated English-language books requested by its Shanghai counterparts. It currently has a membership of about 100. A November 2005 China visit by current San Francisco Mayor Gavin Newsom, accompanied by Sen. Feinstein, commemorated the 25th anniversary of the sister city ties.

San Francisco's sister city relationship with Taipei was equally active in its early days before normalized relations with the PRC, but is less so today. The committee helped San Francisco attract China Airlines flights to SFO, Evergreen Line container service to the Port of San Francisco, and the TECO office to San Francisco. A donated pavilion from Taipei has been a valued addition in the city's Golden Gate Park.

Oakland's sister city relationship with Dalian, China began in 1982, growing out of port delegation visits. The program has mostly involved student exchanges over the years, but activity has stepped up more recently, with a visit from Dalian's mayor in September 2005 and an Oakland delegation to Dalian in the summer of 2006. Oakland also has friendship city relationships with 15 other Chinese cities that offer the same tax and investment promotion incentives from the Chinese side, and plans to pursue commercial opportunities with them.

Milpitas' ties with Huizhou began in 2000 at the urging of a group of business leaders from the Silicon Valley Chinese-American Computer Association. Milpitas has followed the pattern of cities with newer relationships, by evaluating prospective sister cities in terms of their size, education level, economic and cultural compatibility, and active interest in supporting a sister city program. The Milpitas program is limited to cultural and student exchanges only. In April 2005

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the first delegation of 10 high school students and six adults visited Huizhou and Beijing for four days each. A reciprocal Chinese student group visiting from Huizhou in December 2005 was smaller than expected due to visa difficulties.

Redwood City has enjoyed an active exchange with the Pearl River Delta city of Zhuhai over the years, beginning in 1993 with a business visit to China by one of the Port of Redwood City's commercial tenants. Subsequent years have seen a five-day program of Chinese musicians, artists and performers at Canada College, and a reciprocal program of local artists and performers at the Zhuhai Cultural Center; visiting delegations of women business leaders, architects and educators; Chinese internships at Redwood City police emergency services, hospital and planning agencies; and dignitaries passing through as part of a broader Silicon Valley or California tour.

Los Altos also limits its sister city relationship with Shin Lin District in Taiwan to student exchanges, although it too receives formal and informal visits by dignitaries and delegations on an as-scheduled basis. Visitors are often hosted in local homes and the City sponsors receptions and other events. Los Altos puts on an annual "10-10" ceremony each October 10, remembering establishment of the KMT government on Taiwan in 1949.

San Jose's sister city ties to Tainan, Taiwan date back to 1977, and were initiated by efforts of the local Taiwanese community. Tainan's mayor has visited San Jose twice in the past two years. A sculpture presented by Tainan is installed in one of San Jose's parks featuring public art from its various sister cities, the Tainan city flag is flown downtown, and the sister city committee has plans to host a youth baseball game between the two cities.

Davis and Wuxi, a city of 5 million people, became sister cities in 2002. Wuxi was chosen because it is a progressive, outward looking city with a large number of Ph.D.s. Three official city delegations have gone back and forth in the last three years, and Mayor Ruth Asmundson attended a 2005 sister city conference there. Davis High School and Jiangsu Xishan Senior High School have planned exchanges of teachers and volunteers. The sister city committee is chaired by California Institute for Food and Agricultural Research executive director Dr. Sharon Shoemaker, who travels extensively to China.

Watsonville saw parallels of a strong agricultural base and rapid population growth when it formed sister city ties with Pinghu, a Yangtze River city of 502,000, in 2005. The relationship is in its early exploratory stages. Mayor Antonio Rivas and city council member Oscar Rios led a delegation to Pinghu in October 2005, to discuss possible future exchanges; a reciprocal China delegation visited mushroom farms, grape and strawberry growers and tropical fish raising operations, and toured the campuses of Cabrillo College and UC Santa Cruz in September 2006. Santa Cruz real estate developer and investment consultant John Bakalian, who has golf course and product joint venture interests in China and an office in Shanghai, was instrumental with Rios in launching the sister city relationship, and the greater San Jose Hispanic Chamber of Commerce is involved with a second Watsonville business mission to Pinghu in November.

3

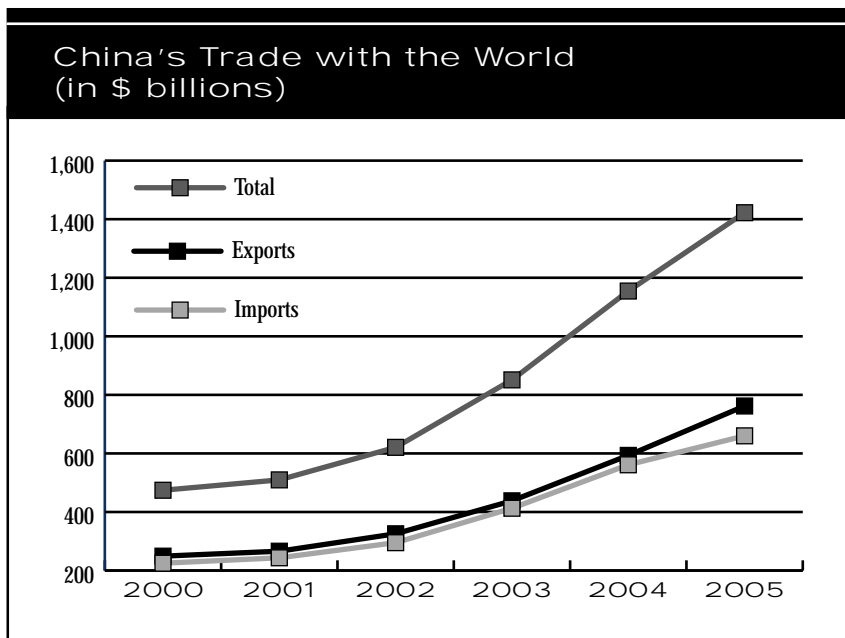
Bay Area-China Trade: Behind the Numbers

Statistics alone do not fully convey the scale and vibrancy of the region's two-way economic connection with greater China. Trade, new business formation, banking, venture capital and other equity investment, strategic partnerships and remittances bind us in unexpected and important ways.

It is no simple matter to measure the full extent of the Bay Area's commercial involvement with greater China. Our overall economic exchange takes many forms:

- Imports and exports of manufactured products and commodities
- Imports and exports of services
- Intra-company sales or transfers of goods, components and materials
- Travel and tourism
- Venture capital and “angel” investment
- Equity investment, mergers and acquisitions
- Residential, commercial and industrial real estate development
- Remittances from the U.S. to family members in China

Trade in manufactured goods is tracked by the U.S. Census Bureau and private data services, through U.S. Customs & Border Protection documentation—for purposes of this report, U.S. import and export shipments moving through the San Francisco Bay Area customs district. Census data collection tracks shipments by commodity description, volume and dollar value. It does not, however, fully distinguish import shipments to Bay Area buyers versus those moving through Northern California gateway ports and airports en route to other parts of the U.S. Nor does it distinguish U.S. exports originating in the Bay Area from those arriving from other parts of the U.S. by rail, truck or connecting flight for transport onward to China, Taiwan and Hong Kong.



Note:
PRC exports reported on a free on board basis; imports on a cost, insurance, freight (CIF) basis

Source:
PRC General Administration of Customs, China's Customs Statistics

In 2005 more than 60% of China's manufactured exports and more than half of its imports involved intra-company transfers among subsidiaries and affiliates of multinational companies manufacturing or assembling finished products in China, either for China's domestic market or for export. Using conventional trade measurements, however, a Bay Area firm that sources raw materials and inputs from multiple countries including the U.S., completes the finished item in China, and ships it to the U.S. for sale is technically "buying" imported merchandise from China. Similarly, when a Bay Area firm ships parts to China for a finished product that will be sent back to the U.S., for sale, the parts shipment is counted as an export.

The "nationality" of trade is deceptive in other ways. Since the late 1990s, a large share of Hong Kong manufacturing activity has moved across the border to lower-cost Pearl River Delta factories. More significantly, Taiwanese manufacturing investment in China—mainly around Shanghai and in the northern coastal provinces—is currently valued in the \$100–150 billion range. This transfer of manufacturing activity, largely for export to U.S. and European markets, shows up as a decline in direct Hong Kong and Taiwan exports, and correspondingly large growth in exports from the mainland. Hong Kong remains the world's largest port in terms of cargo volume, at times trading places with Singapore. But for both ports that cargo represents a mix of China, Southeast Asia and Indian Subcontinent shipments transferred from small "feeder" ships and barges to transpacific or Asia-Europe container ships, bulk carriers and tankers, at highly efficient deepwater terminals.

Many higher value "products" are not necessarily physically shipped. Software and video games previously packed as CDs in boxes with manuals and shipped across the Pacific are now ordered online and downloaded. Architectural plans and advertising designs once delivered in large cardboard sleeves via air courier are now transmitted electronically. These do not necessarily show up in any trade data.

Finally, the nationality of trade *value* in a global marketplace can be deceptive. Many finished goods produced in China are made from raw materials or components—wastepaper, metal and plastic scrap, raw cotton, forest products, chemical resins, steel, aluminum, semiconductors, circuit boards, industrial controls and gauges—originating in the U.S. or third countries. While it is true that China's manufacture/assembly activity has a greater value-added component than the inputs, basic manufacturing has become increasingly commoditized. Most of the retail value of a wide variety of products made in China—flat-panel displays, apparel, appliances, home furnishings, sporting goods, and so on—is created on this side of the Pacific with advanced R&D, product and packaging design, technology features, distribution, marketing, branding and advertising. Wealth creation, in this sense, is not synonymous with trade.

Transactions in which physical goods are not involved—services, direct and portfolio investment, capital flows of various kinds—are not subject to the same comprehensive reporting requirements, and are extremely difficult to track. Services trade is measured nationwide or by state within the U.S. but not broken out by metropolitan area. Foreign direct investment and mergers/acquisition activity are typically tracked only for transactions above a certain size. Still others, such as real estate purchases, are not tracked by nationality. Announced deals are not necessarily completed deals, and completed deals are not necessarily successful deals creating lasting enterprises. As a result, definitive data are mostly unavailable.

That having been said, we can begin to assemble a picture, however imperfect, of the scale of the Bay Area-China commercial relationship through a combination of statistics and anecdote. We can examine key Bay Area sectors—financial and legal services, architecture and engineering, internet portal, information technology services, semiconductors, biotechnology, advertising—and how their activities are reshaping China's society and economy. Through interviews, industry and university studies, articles and web sites, we can form a picture of the significant economic and technological cross-pollination that has taken place between the Bay Area and greater China—and the jobs, business activity and personal wealth they have created on both sides of the Pacific.

Bay Area Ports: Moving the Goods

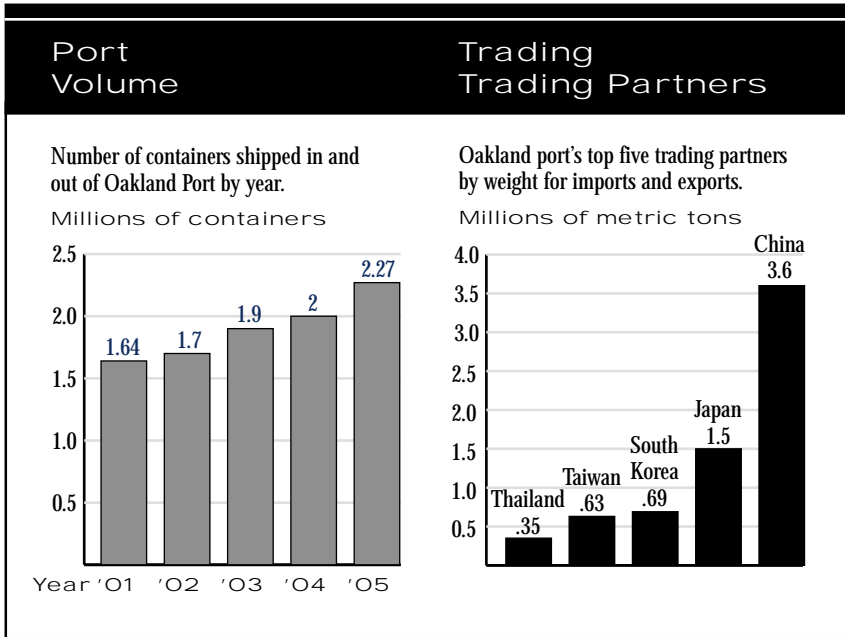
The vast majority of manufactured goods flowing between the Bay Area and China move by ship. Nearly all of it moves in containers of various sizes, primarily in 40-foot container equivalent units (FEUs). Nearly all of this volume flows through the Port of Oakland, the United States' fourth busiest container port, which opened an office in Shanghai in 2006 to promote increased traffic in consumer goods from China to the Bay Area, and farm and other products from the Bay Area to China.

China Is Driving Import Growth

Containerized imports from the PRC, Hong Kong and Taiwan through the Northern California Customs district have increased from 90,000 FEUs in 2001 to 219,000 FEUs in 2005, according to the Port Import-Export Reporting Service (PIERS), a trade data service. A breakdown of

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those totals reveals slight growth in imports from Taiwan over the 2001–05 period, from 12,000 to 14,000 FEU; a steady decline in imports from Hong Kong, from 23,000 to 17,000 FEU; and more than a tripling of imports from mainland China, from 55,000 to 188,000 FEU. Cargo from the PRC to the Bay Area has grown by an average 36% annually since 2002, with the most dramatic growth in 2004 (44.7%) and 2005 (39.6%).



Source:
Port of Oakland

These numbers reflect both the longer-term migration of manufacturing operations in Taiwan and Hong Kong to the PRC and, more recently, the rapid expansion of China's trade since it joined the World Trade Organization in December 2001.

The Bay Area region's top 10 containerized imports from greater China in 2005 included:

<u>PRC</u>	<u>Hong Kong</u>	<u>Taiwan</u>
Furniture/parts	Apparel	Computers
Electronics	Electronics	Resins
Computers	Computers	Electronics
Toys	Toys	Auto parts
Plastic products	Footwear	Hardware/nuts/bolts
Tools	Books/printed materials	Furniture/parts
Piece goods	Furniture/parts	Plastic products
Mixed retail goods	Plastic products	Mixed retail goods
Tires/tubes	Paper products	Glass/fiberglass products
Sporting goods	Foodstuffs	Bicycles/parts

These products tend to reflect local demand, since most import cargo bound for interior points in the U.S. has historically moved through Southern California or the Pacific Northwest. Since 2004, however, freight shippers have increasingly demanded—and shipping lines have increasingly offered—first vessel calls at the Port of Oakland in order to avoid port, rail and highway congestion at Southern California gateways.

A number of large retailers—Home Depot, Target, Walgreen's, Williams-Sonoma, Gap and Dollar Tree Stores—as well as third-party logistics providers, distribution center developers and specialty importers have opened inland warehouse facilities to receive import cargo; inspect, test, assemble, package, label and tag specific items for retail sale; and re-load domestic containers with regional shipments ordered by specific stores. Marine containers are then returned to the Port of Oakland, either empty or with backhaul loads of agricultural and other products for export or local Bay Area delivery.

New distribution center development has tended to concentrate along the I-80/I-50 corridor to Sacramento, Placerville and Sparks, NV, and at the I-580/I-5 juncture in the Stockton-Tracy-Modesto-Lathrop area, near the Union Pacific and Burlington Northern transcontinental rail ramps. Grubb & Ellis Co. reported that a dramatic 3.7 million square feet of industrial property was leased during 2005 along I-80/I-50, more than 2.6 million square feet of that in warehouse/distribution facilities. Industrial vacancy rates overall fell from 16.5% to 14.3%, and unemployment in affected counties fell to an average 4.6%. The San Joaquin Partnership, a public-private economic development corporation, added 857,000 square feet of new and expanded warehouse/distribution space in San Joaquin County during 2005, on top of 3.3 million square feet in 2004.

China-related import distribution has contributed to this growth. The Port of Oakland has seen import container volumes grow steadily since 2001, from 243,000 to 418,000 FEUs. Port container volumes in 2005 were up nearly 11% over 2004 totals, but imports were up 20.3% while exports grew by only 4.1%. Oakland's share of West Coast cargo in 2005 approached 12%, as shipping lines diversified to other ports in order to avoid congestion at Los Angeles and Long Beach, which dominate West Coast trade. That trend has eased somewhat as Southern California terminals have improved productivity and extended gate hours under the "PierPass" offpeak incentive program, but inland rail congestion delays out of Los Angeles and Long Beach, particularly along southern U.S. routes and to Chicago, remain a problem.

Exports Are Also Growing, but More Slowly

Export statistics provide a less clear picture of Bay Area-China trade, since the Port of Oakland and Northern California are historically an export gateway to Asia for the entire U.S. Containerized exports to mainland China via Northern California nearly doubled from 52,000 FEU in 2002 to 102,000 FEU in 2005. During that same period, exports to Taiwan increased from 39,000 to 51,000 FEU, and exports to Hong Kong declined from 35,000 FEU to 27,000 FEU.

Among non-containerized bulk shipments, exports to the PRC from 2001 to 2005—mainly scrap metal, petroleum and chemicals—grew from 611,000 to 723,000 metric tons. During

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2003–05, shipments to Taiwan fell from 47,000 metric tons of machinery, scrap metal, wood pulp and petroleum products to 15,000 metric tons of industrial earths only. Bulk exports of wood pulp and petroleum products to Hong Kong rose from 13,000 to 53,000 over 2002–04, then fell to zero in 2005.

The top 10 containerized exports to greater China through the Bay Area reveal a very different mix of commodities. The list is identical by order of volume for the PRC, Hong Kong and Taiwan, even though actual volumes vary:

- PRC/Hong Kong/Taiwan
- Aluminum ingots/shapes
- Animal feed
- Beverages (incl. alcoholic)
- Industrial clay
- Raw cotton
- Dried fruit/nuts
- Drugs/chemicals
- Earths/related commodities
- Foodstuffs
- Hay

Bay Area Airports: People and Cargo

San Francisco International Airport (SFO) dominates international air traffic moving into and out of the Bay Area, handling nearly all of the combination passenger-cargo and pure cargo operations of regular commercial airlines passing through the region. No commercial carriers out of **Oakland International Airport** (OAK) or **San Jose International Airport** (SJC) International Airports offer direct China flights. Air integrators such as FedEx, UPS, Airborne and DHL serve all three airports, but only SFO and OAK have international flights.

SFO reported 3.8 million passengers traveling to and from Asia in 2005, most of those direct but with some connecting passengers only passing through the Bay Area. That number was up 3.8% over 2004, and represents the largest component of international travelers moving through the airport—nearly half of the total of 8 million SFO passengers in 2005. One advantage the Bay Area offers business travelers in particular is non-stop air service to multiple destinations in Greater China. SFO is a hub for the transpacific operations of United Airlines and Hong Kong carrier Cathay Pacific, and a major stop for Taiwan-based China Airlines. American Airlines, Air China, Continental Airlines, China Southern, China Eastern and United all offer direct flights to and from the mainland.

In addition to Hong Kong service, **United Airlines** offers non-stop service to Beijing and Shanghai from its SFO hub—one of only five U.S. airports with non-stop connections to China. United plans to add seven weekly flights to Taipei and three to Hong Kong in 2007. In a recent

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agreement that will strengthen its role as a national and international service base, United will also perform maintenance on Chinese carrier Air China's Boeing 747 and 777 engines at its SFO maintenance facility. Cathay Pacific and Singapore Airlines also provide non-stop service from SFO to Hong Kong, and Taiwan carriers China Airlines and EVA airlines both provide direct service to Taipei.

While shipments through Bay Area ports generally involve heavier, lower value products, air shipments are generally lighter weight, higher value products. In 2005, SFO handled close to 227,000 metric tons of air freight and mail moving to and from Asia. More than 671,000 total metric tons of air cargo moved through OAK, most of it via integrators, with no breakdown by country available.

FedEx has made Oakland International Airport one of its six U.S. hubs since 1987, and currently employs 1,700 workers at a 350,000-square foot facility that handles 250,000 packages daily. With international shipment volume growing faster than domestic business, Oakland will play a key role in the company's growth in Asia. FedEx took an early lead in the fast-growing international shipping business between Asia and the U.S., first with its purchase of Asian cargo airline Flying Tigers in 1989, followed in 1995 by the acquisition of China air routes from Evergreen International. FedEx expanded its China service from 23 to 26 weekly flights in early 2006 and has been awarded four more flights starting in March 2007. In December 2008 it will shift its Asia hub from Subic Bay in the Philippines to a \$150 million facility in Guangzhou, around the time it completes a major Oakland expansion. FedEx currently has 3000 employees in China, a number that will double upon the completion of its acquisition of FedEx joint venture partner DTW Group.

Competitor UPS, which also serves Oakland, plans to open a Shanghai hub to serve China in 2007. Its Asia hub is slated to remain in the Philippines. Air cargo growth from China to the U.S. is forecast to grow by an average 9.6% annually through 2025, as tech and other high-value business shipments increase and as online and catalogue sales grow. U.S.-China traffic will also expand as per capita incomes rise, China's consumer markets develop and logistical infrastructure extends inland.

Infrastructure—roads in particular—has historically been a major problem for logistics companies like FedEx, which rely at the end of their service chains on ground delivery. The quality of China's road system is improving rapidly, however, with a 60% expansion in its highway network in the last five years. Falling tariff barriers as China implements its WTO obligations can also be expected to stimulate trade growth.

U.S. Census Bureau data offer a breakdown of airfreight imports and exports between the San Francisco Customs District and greater China. Census reports that 2005 air cargo imports from greater China totaled 59,026 metric tons with a value of \$8.78 billion. Air exports to greater China via Northern California gateways during 2005 amounted to 36,103 metric tons of air freight, valued at \$6.84 billion. Leading commodities by volume in both directions are shown below:

Ties That Bind

Imports

Live animals	Industrial machinery, parts
Fresh and frozen seafood	Batteries
Plant cuttings	Consumer electronics
Perishable fruits and vegetables	Cameras
Seeds	Telecommunications equipment
Mineral/chemical compounds	LCD/LED panels
Pharmaceuticals	Semiconductors/integrated circuits
Pigments/dyes	Sunglasses
Semiconductor chemicals	Instruments/controls
Apparel/Footwear	Toys
Luggage	Sporting goods
Computers/office machines	Pearls/semi-precious stones
Watches/batteries	

Exports

Fresh/frozen fruit, vegetables	Aluminum powders, plates
Tobacco	Pumps/compressors/valves
Mineral compounds	Machine tools
Petroleum products	Data processing equipment
Vitamins	Rubber/plastic injection molds
Cosmetics	Telecommunications equipment
Diagnostic lab reagents	Magnetic tapes, discs
Chemicals	Semiconductors/integrated circuits
Industrial silicon	Medical testing equipment
Plastic/polymer sheets, film	Semiconductor test equipment
Plastic containers	Paints/varnishes
Ceramic bricks	Bicycle tires
Stainless steel sheets, wire	Paper/paperboard products

The total value of 2005 manufactured trade moving to and from greater China through the Northern California Customs District—including both air and ocean freight—was \$26.94 billion, including some \$17.6 billion in imports and \$9.4 billion in exports.

China reported \$762 billion in total exports and \$660 billion in total imports during 2005. So far, in first quarter 2006, exports have increased by 27% and imports were up by 25% over the same period in 2005. U.S. exports to China overall have grown by 22% annually since China joined the WTO, according to a recently-released report from the U.S. Trade Representative.

Notwithstanding issues and reversals, China's implementation of its WTO obligations has led to progressive market opening, with barriers dropping in a broad range of sectors. Specific areas remain sensitive. In the first month after global trade quotas on textiles and apparel were eliminated at the end of December 2004, China's textile and apparel exports to the U.S. jumped 75% to \$1.2 billion. Both the U.S. and United Kingdom reimposed temporary, less restrictive quotas which caused some production to shift to Central America and Southeast Asia, although China continues to dominate the global textile and apparel market. For technology companies, U.S. export controls, designed to bar the transfer of dual use (civilian/military) technology will remain an issue.

The valuation of China's currency is also contentious, with U.S. charges that the yuan is deliberately undervalued (disadvantaging imports but providing a distinct advantage to Chinese exports.) In response, China appears set on a course to allow its currency to gradually appreciate, but is wary of rapid change from fear of speculation, instability and the effects of a sudden rise on marginal producers. In July 2005 the government pegged the yuan to a basket of currencies, replacing the dollar peg that had been in place since 1994. The yuan immediately appreciated by 2.1%. It is expected to rise another 4% against the dollar by the end of 2006, and by 4–5% per annum over the next five years.

Estimates vary as to how much the yuan may be currently undervalued, but 20% is considered conservative. It is unclear, though, whether a large revaluation would significantly impact the U.S. deficit, since a cheaper yuan would also lower the cost of imported materials that China uses in its export products, and since U.S. consumers would likely continue spending, but might buy instead from cheaper, non-Chinese suppliers.

Services Trade

High-value services and technology drive the Bay Area economy, and find a ready market in China's fast-growing consumer and business environment.

Financial Services

Market Environment

China began reforming its banking system in 1979, in preparation for entering the global economy and offering market-based financial services. A major task involved consolidation of numerous smaller banks throughout the PRC into the "Big Four" national banks—Bank of China (BOC), China Construction Bank (CCB), Industrial and Commercial Bank of China (ICBC), and Agricultural Bank of China (ABC)—a process completed in 1994. In addition, more than a dozen joint-stock holding banks operate nationally, and more than 100 city commercial banks and several hundred rural credit cooperatives offer retail financial services.

China's banking industry is highly concentrated, though the trend is toward dispersion. The top four banks controlled 52.4% of system assets in 2005. Mid-sized joint-stock banks held 15.5% of

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assets, and smaller “city banks” 5.4%. Growth has been highest among the joint-stock and city banks, which together have seen their market share rise from 30.5% in 1998 to 47.6% last year. Because of weak capital markets, banks offer the most important form of external financing available to the majority Chinese firms. Bank loans and deposits—at 121% and 150% of 2005 GDP, respectively—are unusually large for a developing economy.

Combined personal and business savings during 2005 were estimated at around \$1.1 trillion, or 49% of China’s GDP. At the same time, the People’s Bank of China reported cumulative personal savings across China reaching \$1.7 trillion as of yearend 2005—the result of an annual average savings rate of 40%. China’s household savings rate is high in part to cover retirement and health care in the absence of a reliable safety net, and in part because the money has had nowhere else to go:

- Home and car ownership were out of reach of all but a small number of Chinese.
- Cultural aversion to debt has limited consumer products such as credit cards.
- The renminbi is not convertible for capital account transactions, limiting overseas investment by individuals.
- The poor quality of listed firms, and high stock valuations on the Shanghai and Shenzhen exchanges have limited equity investment.

While banks are now at the forefront of efforts to develop new markets in bonds, derivatives and currency trading, larger banks have until recently had few lending outlets for their vast deposit balances, ending up by default the principal lenders—often by government directive—to thousands of mostly inefficient state-owned enterprises. Local banks, meanwhile, have lacked experience and training in credit evaluation and accounting practices, and have tended to disperse loans based on personal or political connections, or at the behest of government officials to promote economic goals with little regard to attendant risk. Fraud has been common.

As a result, China’s government has given a high priority to cleaning bank balance sheets, reforming corporate governance and improving risk management. Since 1998, the government has spent \$288 billion to help large banks dispose of bad debts and recapitalize. In 2003 a new supervisory body, the China Banking Regulatory Commission (CBRC), was established to improve oversight and accelerate reform of bank lending practices. Even then banks continued to push loan growth to excessive levels in overheated sectors like steel automobiles and property until regulators cracked down. A June 2006 CBRC report estimates remaining current non-performing bank loans at \$160.6 billion, an overall ratio of 7.5% (9.5% for state-owned banks versus 3.1% for newer joint stock banks) that is slowly but steadily declining. This has made China’s national banks increasingly attractive candidates for foreign investment, restructuring and, in some instances, private listing.

At present foreign investors may acquire stakes up to 25%, buying varying degrees of active participation in restructuring, as well as access to China’s potentially huge retail banking market down the road. Over 2001–03, overseas banks acquired shares in Chinese banks valued at \$343 million for stakes ranging from 5–16%, including Citigroup’s \$72 million acquisition of 5% of Shanghai Pudong Development Bank. Two transactions in 2004 totaled \$2 billion, including

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San Francisco-based Newbridge Capital's \$150 million purchase of an 18% controlling stake in Shenzhen Development Bank—the first foreign controlling stake in a Chinese institution.

During 2005–06, foreign investments netted another \$18 billion for 13 banks. And in October 2006 Morgan Stanley acquired 100% of Nan Tung Bank—a Bank of China subsidiary technically classified as a “foreign-funded” bank exempt from ownership limits because it is based in Macau, but which has one commercially licensed Southern China branch in Zhuhai. Nan Tung's foreign funded status and existing commercial license allows Morgan Stanley to leapfrog other foreign competitors and apply immediately to offer a full range of derivatives, foreign exchange and renminbi-denominated banking products to local and foreign corporate customers in China. Foreign banks are currently allowed to make loans and take deposits in foreign currencies, and provide yuan-denominated business services in 25 cities, but the application process is notoriously slow.

Major change will come in 2007, as China further implements its commitments under the WTO by allowing foreign banks to offer retail banking services, including consumer loans and the acceptance of yuan-denominated deposits. As of June 2005, foreign banks had 244 representative offices and 214 branches in China; assets as of April 2005 totaled more than \$76 billion.

With foreign competition looming, Chinese banks aren't sitting still. In addition to government-initiated share sales to strategic investors, major banks—and even some second-tier institutions—are raising unprecedented funds through public share offerings. This includes three of China's “Big Four” which have individually raised capital in the range of \$10–15 billion, and together now have a market capitalization of over \$110 billion—placing them in the world's top ten. CCB raised \$9.2 billion in an initial 2005 listing on the Hong Kong Exchange. A June 2006 IPO, the world's largest since 2000—plus an additional share allotment—raised \$11.1 billion for the Bank of China. An ICBC simultaneous listing on the Hong Kong and Shanghai exchanges in October 2006 was the largest IPO ever, raising in excess of \$19 billion. In addition to capital, foreign investment is bringing new skills—such as retail risk management—to China's financial system.

All of this activity positions Chinese and foreign-owned banks for aggressive competition in a growing retail market segment. Consumer credit, introduced in 1997, has only recently helped diversify lending. Mortgages, car and school loans and consumer credit last year accounted for 26% of new lending. Still, outside of joint ventures with foreign partners, banks offer few fee-generating savings and insurance products. China had only about 12 million credit card customers last year, almost all paid their bills in full each month, and banks have resorted to poaching each others' customers with increasingly costly giveaways.

Bay Area Connections

Foreign-owned banks, private equity partnerships and venture firms have stepped in to fill the financial services gap—in trade finance and private banking services; in strategic equity investments; and in mergers and acquisitions (M&A) and venture funding, to help companies of all sizes achieve scale and global reach.

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One direct investment by a Bay Area financial institution has attracted considerable outside interest. San Francisco-based **Newbridge Capital's** December 2004 purchase of an 18% stake in the mid-sized Shenzhen Development Bank is considered a bellwether by economists and analysts. Although small by Chinese standards at only \$150 million, the purchase gave Newbridge effective management control of the troubled bank. This makes Newbridge the only foreign firm to control a Chinese bank. The Chinese appear to have selected Newbridge in part due to its success in turning around Korea First Bank after the Asian financial crisis. The Newbridge deal is widely viewed as an experiment by the government to determine how effectively foreign investors can rehabilitate troubled banks, and analysts are monitoring the bank's progress closely. It is too early to pass judgment on Newbridge's success, but if it manages to turn around Shenzhen Development Bank, it could encourage the government to allow foreigners to take controlling stakes in other Chinese institutions.

Banks operating in the Bay Area play a limited role in intermediating financial flows with Greater China, but they offer crucial services for facilitating trade and provide financial linkages between the local Chinese community and home towns and villages on the mainland. Although hard data on China-related banking services is largely unavailable, a clear picture of the services provided and major players can be drawn.

Bank units linking the Bay Area with Greater China include several types of financial institutions. Some Taiwanese and Hong Kong banks and their U.S. subsidiaries maintain branches in the Bay Area. Several locally-based banks with close ties to the ethnic Chinese community focus on China-related financial services for Bay Area individuals and corporations, or maintain offices or branches in Greater China. Larger mainstream banks, whether locally based firms like Wells Fargo or nationally based banks such as Bank of America, also conduct business with firms dealing in China from the Bay Area. Often, the Bay Area is the U.S. location of choice from which to develop the bank's China business.

The various types of Greater China-related banks differ more in client bases than activity. The big mainstream banks tend to service larger corporate customers. Branches of Taiwanese or Hong Kong banks focus on clients from their home markets with Bay Area interests. The community banks have historically conducted most of their business with ethnic Chinese, but increasingly are positioning themselves as banks with China expertise rather than ethnic Chinese banks. They target individuals and small and medium-sized businesses with origins or interests in Greater China.

Trade finance is the biggest China-related banking activity conducted out of the Bay Area. Mainstream banks, community banks and Bay Area branches of Hong Kong and Taiwanese banks all provide basic trade finance services such as letters of credit and documentary collections. Because China-U.S. trade is so imbalanced in favor of Chinese exports to the U.S., most trade finance clients are U.S. importers, but some servicing is conducted on the Greater China end.

Within California, competition is increasing between major banks such as **Wells Fargo** and **Bank of America** and smaller banks based primarily in the Chinese-American community, for what is becoming an increasingly attractive market segment. Earlier this year, for example, Wells

Fargo became the first major U.S. bank to provide services through which immigrants from China can wire money directly home, avoiding the need for more expensive remittance companies. By allowing customers in the United States to make account-to-account transfers to China, Wells is tapping into a growing market involving the annual movement of billions of dollars. Wells' Chinese partner is the Agricultural Bank of China.

Several Bay Area financial institutions occupy distinct niches in the China market due to their extensive histories and expertise in serving cross-border market segments. While these niches do not necessarily represent major portions of China banking business, they do suggest important future growth opportunities as the market in China for flexible, customized financial services grows. A separate section later in this report will examine investment activity.

Wells Fargo-HSBC Trade Bank

The **Trade Bank**, established as a nationally chartered U.S. bank in 1995, grew out of an already existing strategic alliance between Wells Fargo and HSBC, formerly Hong Kong-Shanghai Banking Corp. The Trade Bank focuses on domestic U.S. companies involved in international commerce and uses the combined reach of Wells Fargo in the U.S. and HSBC overseas to deliver services to its customers.

HSBC has a particular strength in China with the largest foreign bank network—13 branches and 13 sub-branches. Two equity investments made by HSBC in Chinese banks—buying 8% of Bank of Shanghai in 2001 and 19.9% of the Bank of Communications in 2004—increases its potential branch network and offers broader access to local customer bases.

Early on, HSBC was able to leverage its international operations and Greater China expertise and connections as a bridging entity between the PRC and Taiwan. Taiwanese firms investing in PRC manufacturing facilities faced difficulties with financing and repatriation of earnings: mainland banks lacked international experience, Chinese currency was not convertible and Taiwanese banks were prohibited from operating in the PRC. HSBC could provide financing in the PRC, facilitate international procurement of parts and raw materials via Hong Kong, and offer cash and relationship management in Taiwan.

The San Francisco-based Trade Bank focuses on companies with \$20 million to over \$1 billion in annual turnover. It offers credit lines, trade finance, accounts receivable and purchase order financing, foreign exchange services and specialized products such as forfaiting (conversion of trade receivables to debt instruments that ensure payment in emerging markets) and export finance. The bank's business has been growing at an average 20% annually, and at a higher rate in the Bay Area which accounts for most of its business. In 2005 it opened a Palo Alto office to serve Silicon Valley clients.

While the primary focus remains trade finance, with the move by companies away from letters of credit the Trade Bank has been developing supply chain solutions to finance open account transactions. Chief operating officer Dominic O'Hagan says the bank's strategy is to leverage the

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Wells and HSBC networks to support its customers looking to finance both ends of Asia-U.S. trade transactions.

As trade and investment with greater China has expanded, so has the accumulation of private wealth on both sides of the Pacific and, with it, competition for private banking clients. Wells Fargo vice president for private banking Jane Hennessy says the Wells Fargo and HSBC networks collaborate in providing cross-border private banking services. These might include opening accounts; establishing credit through credit cards and auto leases; assisting with portfolio and real estate investments, and arranging mortgages or college loans.

Silicon Valley Bank

The unique beginnings and evolution of Silicon Valley Bank (SVB), headquartered in Santa Clara and established in 1983 to serve the particular needs of emerging technology industries, now favor the bank's expansion into China.

SVB's U.S. branch network of 27 offices maps the growth of tech-based communities, the emergence of advanced Asia-U.S. sourcing networks and supply chains, and the wealth creation that accompanied the 1999–2000 tech bubble. With the bursting of that bubble, Asia's gradual recovery from the 1997 economic crisis and China's rapidly growing economy, SVB's focus is increasingly cross-border.

SVB has been active in Asia on behalf of its U.S. tech industry, venture capital and private equity clients since 1991 through its Pacific Rim and trade finance groups, providing mainly merchant banking and business advisory services on both sides of the Pacific. Over 40% of SVB clients do business internationally and 20% have offices overseas. In 2004 the bank established SVB Global to build and manage relationships among corporate clients and private equity investors in the Europe, Israel, India and China markets. An affiliate entity, SVB Business Partners (Shanghai) Co. Ltd., opened a Shanghai office in 2005 as a wholly foreign owned enterprise (WFOE) offering consulting and administrative/business services. SVB has an affiliate relationship with Standard Chartered Bank, accessing headquarters, branch and representative offices offering corporate banking services throughout greater China.

In addition to offering securities broker-dealer services, SVB manages a \$700 million family of five investment funds through its SVB Capital subsidiary, and offers M&A and private capital advisory services through its SVB Alliant unit, launched in 2001 with the acquisition of boutique investment bank Alliant Partners. SVB Alliant has closed more than 400 transactions in its history and has been a leader in semiconductor M&A deals.

SVP Global senior vice president-Asia Daniel Quon heads SVB Business Partners in China and has been responsible for SVB's fund of fund and direct investments in Asia. He stresses that SVB Business Partners is not currently set up to provide retail or corporate banking services, even after China's banking market opens up to allow foreign-owned banks to take deposits and offer services in local currency. Instead it offers liaison trade, foreign exchange and other banking services through SVB in the U.S. and Standard Chartered in China, and consulting,

administrative and business services for select clients visiting China. Quon's primary job is building relationships. SVB's Shanghai offices are "set up like a VC hub," he says, sharing space with venture firms such as New Enterprise Associates and Bessemer Venture Partners.

In June 2004 Quon, a former AAMA board member and advisor to Hong Kong-SV.com, led a senior-level delegation of 25 venture, corporate and private investors to Shanghai and Beijing, introducing them to Chinese government and business leaders. Focusing on the bank's principal market segments of technology and life sciences, Quon also cultivates Asian equity sources and connects them with Silicon Valley entrepreneurs. SVB has limited its China activities so far to fund of fund investments and debt financing in support of transactions for its VC and company clients, but may move into equity financing down the road.

SVB sees its competition in the U.S. coming less from traditional banks than from flexible financing entities such as lease funds that cater to smaller but fast-growing companies whose capital needs may at times exceed their internal borrowing. In China, Quon says, capital markets are a decade behind those in the U.S., and banks are still a long way from possessing the agility or credit underwriting expertise to finance growth companies in emerging tech sectors. In addition, alumni and professional networks in China are not as fully formed as the transnational communities in Silicon Valley. All of which translates into a valuable niche for SVB, in connecting Chinese and U.S. entrepreneurs with financing, and also connecting companies and investors with lawyers, accountants, human resource (HR) consultants and other service providers with cross-border expertise.

United Commercial Bank

San Francisco-based **United Commercial Bank** (UCB) has grown in eight years from a \$1 billion thrift to an \$8 billion transcontinental and transpacific commercial bank—first by marketing aggressively to the ethnic Chinese community in the U.S. with deposit accounts, credit cards, mortgages and commercial loans and, later, by establishing a Greater China presence and pursuing cross-border trade finance and private banking.

UCB president and CEO Thomas Wu arrived in Southern California from Hong Kong in 1991, to take a position as regional manager for Hong Kong-based First Pacific Bank's United Savings Bank unit. Despite his banking experience, good cash reserves, solid income and a 30% down payment, as a new arrival he was repeatedly turned down for a mortgage because he could not provide a two-year credit history.

Wu saw a community banking opportunity: An estimated 70% of Asian-Americans living in the U.S., many of them new immigrants, live on the West Coast. They make up an affluent, well-educated and underserved customer base with higher than average savings and a lower than average default rate. Over the next seven years, six of them in San Francisco as director of retail banking, Wu helped United Savings carve out a niche in the immigrant Chinese community with loan products that assess creditworthiness based on job verification, bank statements, and canceled rent and utility checks; the bank had no charge-offs or delinquent loans on these mortgages after 14 years and more than \$1 billion in loan originations. United Savings also offered popular

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seven-day banking at many branches; trilingual ethnic Chinese staff (Mandarin, Cantonese, English) and bilingual Chinese/English brochures and ATM access; and assistance with social security numbers, driver's licenses and tax preparation.

In 1998 First Pacific's Indonesian owners came under financial pressure to sell United Savings as a result of the 1997 Asian economic crisis. Wu, by then president and CEO, led a management buyout. United Savings' charter was changed from that of a savings and loan to a commercial bank, and it was taken public as United Commercial Bank.

Wu next broadened UCB's strategy to include trade finance. Specifically, Southern California was the leading U.S. gateway for trade with Asia, yet no Chinese-focused bank had a presence in both California and Asia to serve trade finance customers. UCB opened a representative office in Hong Kong in 2002, and a short time later received Hong Kong Monetary Authority approval for a full banking license. At the end of March 2006 UCB's Hong Kong branch had over US\$600 million in deposits and US\$400 million in loan commitments. The bank has subsequently added to its Asia trade finance and private banking coverage with representative offices in Taipei and Shenzhen.

UCB has expanded its U.S. branch network through a combination of organic growth and acquisitions in New York, Boston and Seattle, along with the 2002 purchase of the historic Bank of Canton in San Francisco. Of its 56 U.S. branches, 47 are in California and 27 are in the Bay Area. Today, UCB's mix of commercial, real estate, construction and international trade finance is targeted at small and mid-sized businesses, with loans in the \$500,000 to \$20 million range. UCB reported \$7.99 billion in assets as of March 31, 2006, and has set a growth target of \$15 billion in assets in 2010.

Other Bay Area banks are expanding their trade finance activity, with Greater China as their principal focus. **Bank of the Orient** was opened in San Francisco in 1971 by Ernest Go, member of an overseas Chinese family in the Philippines with international banking interests. Its first downtown office bridged the adjoining neighborhoods of Chinatown and the city's financial district, and catered to what Go saw as an underserved market of Asian-American small and medium-sized businesses. A Chinatown branch opened a year later. The bank's business expanded over the years with a strong mortgage portfolio in one of the nation's most consistently expensive residential real estate markets.

Bank of the Orient's growth strategy has primarily involved community banking in Chinatowns or Asian-American population centers in San Francisco, Oakland, Millbrae and City of Industry in Southern California. In 2000 it opened two Honolulu branches with the acquisition of the Bank of Honolulu.

In 1986 Bank of the Orient upgraded a representative office in Xiamen, a port city and designated Special Economic Zone directly across from Taiwan, to full branch status. Xiamen, one of China's wealthiest cities in terms of per capita GDP, has attracted significant international trade, investment and tourism in the past decade, and the Fujian provincial government has further economic and infrastructure development plans along the entire western coast of the Taiwan

Strait. This in turn has helped expand the bank's customer base of local trading companies, foreign invested enterprises, foreign nationals and residents of Hong Kong, Macau and Taiwan. It recently received Chinese government approval to conduct foreign currency transactions, including renminbi, for business customers. Today Bank of the Orient has 160 employees throughout its network, and assets of some \$640 million.

For banks headquartered outside the region, the Bay Area offers a logical U.S. base from which to develop their China business. The trade finance portfolio at **First Bank**, for example, is heavily composed of local companies doing business in Hong Kong, China and Taiwan. Its Grant Avenue office, in San Francisco's Chinatown, deals actively with the Chinese community there. While not on the scale of large banks, financing trade with China constitutes a significant part of First Bank's business in the Bay Area. Pasadena-based **East-West Bank**, the largest Chinese-American bank in the country, has 10 of its 61 retail branches in the Bay Area, and offices in Beijing and Hong Kong. While the bank's retail clientele is heavily Chinese-American, its commercial banking business is equally divided between Chinese and non-Chinese clients, with a strong focus on trade finance between California and China. Michigan-based **Comerica Bank**, which opened a representative office in Shanghai in 2006, is developing its China strategy, including outreach to the Chinese-American and Chinese-owned business community, from the Bay Area.

Greater China banks with Bay Area branches, such as Hong Kong's **Liu Chong Hing Bank** and **Shanghai Commercial Bank**, and Taiwan's **Chiao Tung Bank**, also offer trade financing. Liu Chong Hing Bank and Shanghai Commercial Bank are unusual in that they provide retail banking services for a sizable number individual, high net worth Hong Kong expatriates who maintain investments or properties in the Bay Area.

Remittance services are important both to Bay Area ethnic Chinese and to localities on the mainland. As with other ethnic groups in the U.S., many Bay Area Chinese immigrants regularly send money to their families in China. Although these remittances form an insignificant part of the national balance of payments of China and the U.S., they can contribute considerably to the economies of smaller towns and villages in the southern and coastal provinces where most of the Bay Area's Chinese population originated.

Since the early decades of the last century, locals have called southern China regions seeing the largest remittance inflows "overseas Chinese counties." Much if not most of the remittances fund housing. Modern, multi-story western-style villas have replaced many of the traditional farmhouses in these areas.

Little hard data on remittances to China either from the U.S. as a whole or the Bay Area in particular exists, but studies of national remittance patterns indicate that most of the funds bypass the banking sector, instead flowing through informal channels. Western Union estimates that as much as half of remittances entering China pass through underground wire services or are physically carried into the country.

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Most likely, smaller banks with roots in the local Chinese community process most of the remittances that do pass through the Bay Area banking system. Although all large banks offer remittance services to China, existing relationships with the Chinese community give ethnically-based banks an advantage in the remittance market. Remittances form a small but growing part of local Chinese community banks' business.

Banking linkages between the Bay Area and Greater China extend beyond the traditional lending business. Bay Area and Greater China banks will often maintain branches or subsidiaries on the other side of the Pacific to help foster the home bank's relationship with clients with international interests. In this sense, overseas branches function less as revenue centers than as a way to establish useful contacts and acquire local knowledge that can help core clients in the home market.

Visa International is playing a different and very distinct role in China's evolving financial system. At the beginning of 2006, there were 10 million international Visa cards issued in China, represent a nearly 70% market share of China's growing payments card system. In 2005 this represented a retail sales volume of \$7.6 billion. Within five years the number of cards in circulation may reach 50 million. Visa began operating in China in 1997, with an agreement with the People's Bank of China to jointly develop China's National Integrated Circuit Chip Card Standards, that subsequently defined the platform for IC card applications in China. Since then Visa has introduced advanced payment card technologies and market strategies to 18 Chinese member institutions, including the Bank of China, Agricultural Bank of China, Industrial and Commercial Bank of China, China Construction Bank and the Bank of Communications. Visa has also launched co-branded affinity cards, similar to those in the U.S., with banks, private companies and leading university alumni networks throughout the country. At the end of 2005, 40,000 ATMs in China were connected to the ATM/PLUS international network, enabling cardholders from around the world to withdraw Renminbi. While use of credit cards in China is still in its infancy it is growing rapidly, with Visa playing a central role in its development and that of the much larger electronic payments sector.

Note: The Forum extends special thanks to the Federal Reserve Board of San Francisco and to bank country analysts Daniel Fineman (Southeast Asia, ex Philippines) and Richard Lung (China and Taiwan) for their contributions to the preceding section.

Legal Services

Market Environment

Foreign law firms were not officially permitted into China until 1992, but as early as 1979, firms such as Coudert Bros., Baker & McKenzie and Graham & James took advantage of a loophole in Chinese law allowing in trade-related consultants. They established legal "consultancies" in their home countries or in Hong Kong, and then opened informal China subsidiary offices—most located in suites in the Beijing Hotel—to serve as counsel for corporate clients doing business in the PRC.

Shanghai-born Sandy Calhoun, now with **Squire Sanders & Dempsey** in San Francisco, opened Graham & James' offices in Japan during the 1950s, and arrived in Beijing in 1979 to help a San Francisco developer, Clement Chan, negotiate a joint venture with the Beijing International Travel Services to develop a hotel. Calhoun and a partner did not set up as consultants, but rather obtained visas as university lecturers. China had not yet reinstated a formal legal system—criminal and civil cases were decided by the government and the Communist Party. In the absence of commercial law, contracts—and the relationship and trust between the parties behind it—precedent determined a loose legal framework for joint ventures until, of course, a dispute arose or the government intervened. At first, arbitration was permitted but had to be within China. Over time, Hong Kong and Sweden were allowed as arbitration venues. More recently, the arbitration venue is left to negotiation by the contracting parties.

Keeping a Lid on Foreign Lawyers

WTO compliance has eased restrictions on foreign law firms in terms of establishing a mainland China presence, but constraints remain. Foreign firms are limited in the number of offices they may open and the cities in which they may operate, with a required waiting period to open a new location.

Foreign attorneys officially practice the laws of their home countries only. They may not represent clients in Chinese courts or render opinions on Chinese law, nor are they permitted to take the Chinese bar exam. Chinese lawyers may not join foreign law firms without first surrendering their Chinese law licenses. Representatives of foreign law firms in China must be attorneys in good standing with at least three years' practice experience in their home countries. Chief representatives must spend at least 180 days of the year in China, bringing them under Chinese tax jurisdiction.

Law firms initially followed their Western corporate clients into the China market, acting as advisors on trade and customs issues, contract preparation, intellectual property protection, and formation of joint ventures. Since China's admission to the WTO, however, the market for investment-related legal services has expanded dramatically to include establishment of wholly foreign-owned enterprises (WFOEs), merger and acquisition transactions and related due diligence; real estate development transactions; and preparing state-owned and private companies for initial public offerings.

A Different Cultural Landscape

Lawyers are reluctant to talk about specific China cases or clients, but they are willing to share insights about the overall landscape in which they operate. San Francisco attorney Bruce Quan has been advising clients doing business in China since 1985. He divides his time among the Bay Area, Beijing and Shanghai and is both an associate professor of law at Beijing University and an adjunct professor of law at Hastings College of Law in San Francisco, teaching Chinese law and legal culture. Since the 1980s he has organized numerous professional exchanges of lawyers and

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judges through Berkeley's Boalt Hall and the San Francisco-Shanghai Sister Committee, and he currently has an of counsel relationship with Chinese law firm AllBright Law Offices.

Quan acknowledges that, while China has made considerable progress on legal reform in recent years, government enforcement mechanisms are weak and dispute resolution through the courts can be arbitrary. Even after contracts are signed, negotiations continue as to their meaning. Local officials, the central government and the Communist Party can all influence court and arbitration decisions and, at least until recently, they have tended to strongly favor the Chinese party in a dispute.

The government tends to give "public good" considerations—protecting domestic industries and jobs, for example—priority over individual commercial rights. An extension of this principle can be said to apply to intellectual property cases, where China often sees a philosophical, developing country "right" to certain technology transfer free of prohibitive costs. Yet it should be stressed that China's patent and trademark laws generally conform to those of most countries in the world other than the U.S., favoring the first party to file a patent or register a trademark versus the inventor or first user. And recently China upheld Pfizer's patent on Viagra and toughened IP protection in cases affecting public health, in response to risks posed by counterfeit pharmaceuticals.

Attorneys in China practice frequently refer to being "hometowned" by a legal system based on civil law tradition, with a three-judge panel instead of a jury, no attorney cross-examination of witnesses, and only a single appeal permitted. Most of China's 200,000 judges are recruited from the military or the police and given on-the-job training, or increasingly are recent law school graduates with relatively little practical experience. Most judges are hired, paid, promoted and fired by local or provincial governments.

Court "adjudication committees" made up of local administrative leaders may intervene in cases, usually behind closed doors. Use of local officials or police to harass outside parties to settle—either to dispose of a case quickly and quietly, or in a way favorably for local plaintiffs or defendants—is not uncommon. Behind the scenes influence from the Communist Party is also a frequent aspect of dispute resolution. Experienced attorneys, while praising China's ongoing, rapid transition to the rule of law, privately acknowledge that use of connections and relationships—"guanxi"—is still an important asset that any foreign lawyer must bring to the table.

Most commercial disputes are settled through an arbitration process rather than the court system. The favored arbitration venue specified in commercial contracts is the China International Economic and Trade Arbitration Commission (CIETAC), a panel of international lawyers established in China in 1989. Some 200 cities also have their own arbitration commissions as an alternative, and courts in some large cities have created special departments to deal with foreign trade and investment issues in lieu of arbitration.

The system is still far from perfect: Even CIETAC has acquired a reputation for corruption, ex parte communications and other unethical practices. And some foreign companies receiving favorable decisions in arbitration have still had to sue in Chinese courts to enforce judgments

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when defendants refused to pay. As mentioned earlier, the arbitration venue is negotiated and specified in commercial contracts between parties, and is a function of bargaining leverage. Many attorneys advise clients to refuse any China arbitration or, failing that, to require that the arbitration panel chair be a third country national. Use of local arbitration panels requires due diligence and venue shopping. Cedric Chao, an attorney with **Morrison & Foerster** in San Francisco who is licensed to sit on CIETAC arbitration panels, says international arbitration is still the fairest dispute settlement option for foreign companies.

Intellectual property cases are the exception, Chao says, and are typically heard in court for two reasons: IP cases can be highly technical and if the arbitration panel gets it wrong there is no appeal provision, whereas a court ruling can be appealed; and the absence of juries and punitive damages in Chinese courts moderates potential awards. Courts can also grant immediate injunctive relief to plaintiffs, halting the activities of counterfeiting operations. The downside is that a civil court case is a more public process than arbitration, and a case involving foreign and Chinese litigants—particularly one centering on intellectual property protection—may be more likely to attract press coverage.

Courts may be gradually gaining in favor among attorneys. A compulsory national exam for judges, prosecutors and lawyers has helped professionalize the courts. In addition, commercial cases pitting foreign versus Chinese litigants often attract publicity and cause judges to exercise greater caution in hearing those cases—to the point that Chinese companies have complained at times that they cannot get a fair hearing.

An estimated 100 foreign law firms operate in China. The licensing process is less than transparent, involving extensive documentation and approval delays. Attorneys are barred from identifying themselves as such and practicing in China while license applications are pending, but a number reportedly operate unofficially out of hotels without business cards.

Bay Area Connections

Bay Area lawyers, judges and legal scholars have been active in China since the early 1980s, participating in exchanges and directly advising China's government and its courts, including the Supreme People's Court, on legal reform. Many of these exchanges were initiated through **UC Berkeley's Boalt Hall School of Law** and through the San Francisco-Shanghai Sister City Committee, chaired by San Francisco attorney and city supervisor Gordon Lau. As already noted, for many years the Asia Foundation has played a major international role supporting legal development in China.

Leading Bay Area Law Firms Active in China

Allbright Law Offices

Baker & McKenzie

Cooley Godward

DLA Piper Rudnick Gray Cary

Heller Ehrman

Ties That Bind

Jones Day
King & Wood
Latham & Watkins
Morgan, Lewis & Bockius
Morrison Foerster
O'Melveny & Myers
Orrick, Herrington & Sutcliffe (acquired Coudert Bros. China practice)
Paul Hastings Janofsky & Walker
Perkins Coie
Pillsbury Winthrop
Preston Gates & Ellis
Ropers Majeski Kohn & Bentley
Sonnenschein Nath & Rosenthal
Squire Sanders & Dempsey (acquired Graham & James)
Thelen Reid & Priest
White & Case
Wilson Sonsini Goodrich & Rosati

International Trade and Investment Specialization

A select community of Asia-focused attorneys and law firms has grown up around the extensive international trade moving through the Bay Area for most of the 20th century. It should be noted that, until the advent of containerization in the 1960s, Northern California was the principal U.S. trade gateway to and from Asia nationwide.

More recently, Silicon Valley law firms have followed tech industry companies to China, facilitating cross-border trade and investment. Bay Area attorneys serve on CIETAC panels, and some have of-counsel relationships with Chinese law firms. For example John Huang, founding partner of one of China's largest law firms, **AllBright Law**, is a graduate of Hastings College of Law in San Francisco; and current AllBright managing partner Kevin Qian practiced law with Pillsbury, Madison & Sutro in San Francisco before returning to China.

Many larger U.S. corporate law firms initially shied away from China because of government restrictions and relatively small deal sizes. A small number of entrepreneurial Valley lawyers carved out a niche in cross-border semiconductor, internet and other tech investment in Taiwan and mainland China—and have shared in the rewards of successful startups, rollups and IPOs.

Further easing since 2004 of China's investment rules has greatly increased the size and diversity of China deals. Howard Chao, head of **O'Melveny and Myers'** Asia practice, says Bay Area attorneys are now in growing demand for their China expertise and connections, increasingly from clients outside Silicon Valley and the tech sector. O'Melveny, for example, has recently advised

the lead investors in Focus Media's \$172 million IPO, represented Chinese medical device manufacturer Mindray Medical International in its \$270 million NYSE IPO, represented a Japanese photovoltaic cell maker being acquired by Chinese photovoltaic cell producer Suntech Power, and represented a Morgan Stanley-led consortium purchasing \$1.3 billion in non-performing loans. Foreign law firms are following their investor clients beyond Beijing, Shanghai and Guangzhou into northern China and the interior.

Competition Intensifies

At first glance, there would seem to be a glut of foreign lawyers flocking to China, but in terms of specific commercial expertise and relationships there may actually be a shortage. The August 2005 breakup of **Coudert Bros.** prompted a rush among firms to lock up the approximately 50 Hong Kong, Beijing and Shanghai lawyers comprising Coudert's China practice. **Orrick, Herington & Sutcliffe** eventually prevailed over rival bidder Baker & McKenzie in acquiring the three offices, with other firms pursuing specific Coudert lawyers. **Wilson Sonsini Goodrich & Rosati**, meanwhile, responded to pressure from major Chinese clients and lured back its lead China attorney, who had moved to a Wall Street firm in 2005, to head a new Shanghai office.

Foreign and Chinese lawyers currently have a complex relationship of cooperation and competition. They frequently work together in situations where the foreign firm's client is involved in a court proceeding or requires an opinion letter based on Chinese law. And, as the experience and skills gaps between foreign and Chinese attorneys have narrowed, they more often pursue some of the same China business.

Cost pressures add to the tension. Chinese clients commonly demand fixed fees and discounts, and select law firms primarily on price. Experienced lawyers are in short supply and charge a premium. Office rental and staffing costs, particularly in Beijing and Shanghai, are high by global standards. These and other factors have prompted foreign firms to seek out higher-end client work in areas such as IPOs or intellectual property protection and licensing. To manage workload and control costs, many have recruited Chinese law school graduates and lawyers willing to surrender their Chinese law licenses in order to obtain global practice experience and enhance their resumes. Foreign firms may pay Chinese staffers one-third the salary of a home country counterpart, but that still amounts to three times the salary at a Chinese firm.

A trade group of Chinese lawyers in Shanghai has publicly complained that these non-licensed Chinese lawyers are unofficially drafting contracts, rendering opinion letters, preparing applications and registrations with government agencies, and directing litigations and arbitrations—work reserved under current rules for Chinese lawyers. The government issued a warning to foreign firms but otherwise has yet to act on the complaint.

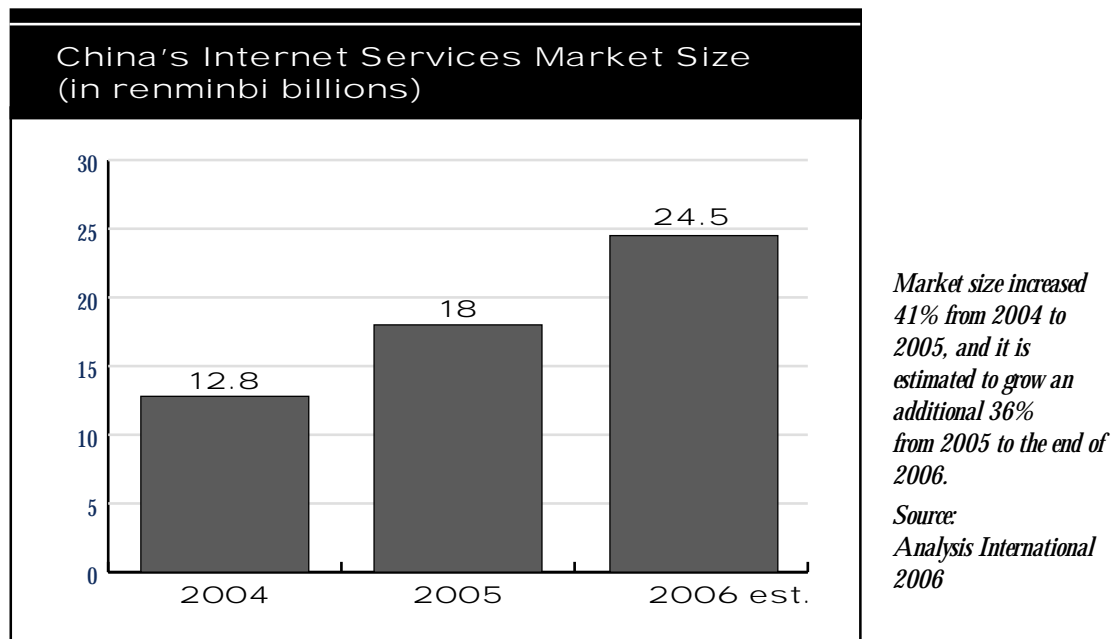
Song Zhu, a Chinese-born, U.S.-educated attorney with Squire Sanders in San Francisco who also has an engineering background and specializes in patent law, sees continued opportunities to assist U.S. firms entering the China market with IP protection and licensing, regulatory compliance and meeting technical standards. Down the road he sees Chinese companies branching out

as global brands and entering the U.S., but that is several years away for all but the largest companies and even then, political obstacles are likely to slow the process.

Internet Services

Market Environment

No society, not even the U.S., has embraced the internet with the speed and scale that China has, and Silicon Valley has been an integral part of the growth story. The PRC has 111 million internet users, half of them with broadband service. Most are young, and use the Internet primarily for messaging, online chat, blogs and gaming. By 2010, that number is expected to grow to 232 million, according to Shanghai-based iResearch, a market research firm.



Like many developing countries, China has leapfrogged conventional wire-line phone service due to the high infrastructure costs involved, and focused development support on wireless. At the end of April 2006 the PRC had 416 million subscribers, according to government figures, adding 59 million new subscribers—more than the population of Italy—in 2005, and 23.2 million in the first four months of 2006. China is expected to spend \$35–40 billion to deliver third-generation (3G) wireless service nationwide in time for the 2008 Olympics, based on a newly developed TD-SCDMA network standard for the country's two state-owned wireless providers, China Mobile and China United Telecommunications, plus wire-line provider China Telecommunications. The carriers are expected to spend a combined \$12 billion.

An Electronic Public Square

Most internet access in China is via mobile phone, although computer use has grown steadily as well as global computer prices have fallen. An explosion in chat, blogs and online communities is driving mobile phone and internet growth in a society where communications and public discussion have historically been top-down and tightly regulated.

Faced with this challenge, 11 government agencies employ an estimated 30,000 censors, and the major portals and search engines in China all have some degree of in-house self-censorship. Internet censorship in China surfaced as a political issue in the U.S. in 2005, after it was reported that Cisco Systems filters, designed to block the spread of worms and viruses, enabled the Chinese government to block viewing of pro-democracy, Falun Gong and other sites; that Microsoft, Yahoo! and Google censored keyword searches for the China market; and that Yahoo! provided Beijing with email and registration information that led to arrests of journalists and political activists. Cisco argued that its filters had not been modified in any way to encourage censorship and that blocking capability was critical in keeping networks up and running. Microsoft, Yahoo! and Google argued that their global search engines on balance broadened access to information in China, and that they could not practically avoid compliance with Chinese law. Competing Chinese portals capitalized on the negative publicity. Yahoo! lost market share with news of the arrests, but has since regained it through its affiliation with Alibaba.

But a bigger picture suggests that internet censorship in China may be a losing battle. A survey by internet portal Baidu.com estimates that 16 million Chinese maintain nearly 37 million blogs, personal websites hosting discussion of all kinds of topics from the personal to the political, with links to other blogs and sites. Live personal interchanges are socially preferable in China to automated email and voicemail; some 87 million computer and phone users communicate by instant messaging. In 2005, mobile phone users sent 329 billion text messages, and January-April 2006 volumes grew by 46.5% over the same period a year earlier, to 132 billion messages. Search engines receive 360 million requests daily. China had 115 million internet search users in 2005, and the number is forecast to grow to 187 million in 2007. In a very short time China has become the world leader in numbers of mobile phones, cable television subscribers and installed phone lines, according to Morgan Stanley.

The Internet Begins to Pay for Itself

'Monetizing' various aspects of China's internet—listings, advertising, e-commerce—has been a major concern. Revenues from these activities have grown significantly in the past year. Shanghai-based consultancy iResearch says online ad spending has increased 75% annually since 2003, and is expected to top \$812 million in 2006 and \$1 billion in 2007. Still, online sales represent only 2.3% of total ad revenues, suggesting enormous growth potential. A Tsinghua University report says the leading web portals saw 25% ad revenue growth during 2005. Sohu.com Inc., China's third largest web portal behind Sina Corp. and Google, reported 35% growth in first quarter 2006. Thanks to sports, entertainment and game tie-ins, Sohu now gets two-thirds of its revenues from advertising, double the share in 2003.

Companies also earn money from text and multimedia messaging, wireless internet over mobile phone, music downloads and custom ring tones. Tencent, an instant messaging web site, sells users phones linked to its QQ.com services, and charges for games, online dating services and data storage. Its ad revenues more than doubled in 2005 and ad rates rose 50%. At the same time, however, hunger for broadband content has driven up the prices internet services pay domestic and foreign providers of music, movies and games.

Search and Sell

Monetizing search poses special problems: Until 3G wireless is fully built out, search is done over mobile phone largely through non-internet directory trees, with users guided through unwieldy voice and keystroke menus. Business-to business (B2B) and business-to-consumer (B2C) services are slow to develop because most of China's 22 million small businesses in 31 provinces are still "unmapped," in stalls or storefronts without signs or building address numbers, on unnamed streets.

Online commercial transactions are growing, but online payment is still in its infancy. McKinsey & Co. estimates that only about 50 million Chinese earn the \$5,000 a year or more that provides them with true disposable income. As noted earlier, Chinese consumers have traditionally been debt-averse and pay their bills in full each month. As a result there are only about 12 million credit cards in circulation, compared with 800 million debit cards tied to a bank account. Few banks or phone companies have had the capability to manage electronic fund transfers via computer or phone, without partnering with portals or search engines.

Growing Pains

Successful, rapidly expanding services are testing the operational limits of broadband networks, and the patience of the Chinese government. Massively multi-player online role-playing games (MMORPGs)—NetEase.com Inc.'s Fantasy Westward Journey, Shanda Interactive's Legend of Mir II, Tencent's QQ Fantasy, The9 Ltd.'s World of Warcraft—have at times drawn as many as 600,000 concurrent players onto computer and mobile networks for a single game, raising actual or potential quality of service problems. Music download revenues in China last year exceeded the total revenues of the entire traditional music industry; a single top-selling song was downloaded 15 million times on China Mobile's network alone over a six-month period.

In November 2005 China's central bank, the People's Bank of China, set a maximum internet payment transfer amount of 1,000 renminbi (\$123.53) per transaction and 5,000 Renminbi (\$617.65) per day, to reduce the potential for e-commerce fraud. In July 2006, China Mobile—urged by the Ministry of Information Industries after a flood of complaints—established rules to curb fraudulent mobile phone marketing and billing practices. The government has also taken steps against portals for spam, internet pornography and fortune telling ads.

Gradually, however, the obstacles are being overcome and a uniquely content-rich Chinese internet is emerging—but not without a lot of help from Silicon Valley.

Bay Area Connections

Northern California companies and investors have played a central role in building China's internet. The internet infrastructure is driven by **Cisco Systems** routers, switches and filtering technology, which make up the backbone of both the public internet operated by China Telecom, CHINANET, the nationwide CERNET education network, and the next-generation CN2 network. **Sun Microsystems**, Nortel Networks and **3Com** also provide equipment and software.

Web portals **Google** and **Yahoo!** between them hold an estimated 34% share of the China market. **Baidu.com**, the leading portal with a 44% share, is the creation of Robin Li, a veteran of the Silicon Valley internet navigation firm Infoseek; and Eric Xu, a UC Berkeley post-doctoral graduate with a background in Silicon Valley biotech and e-commerce. Since 2002, Baidu has taken over the lead position from Google with a uniquely Chinese combination of self-censored search and ready access to MP3 music downloads. The company launched a highly successful public NASDAQ offering in August 2005, aided by Bay Area venture firms Draper, Fisher, Jurvetson and IDG Venture Capital, among others. IDG and Walden International were early funders of the two other leading Chinese web portals, **Sina Corp.** and **Sohu.com**. Silicon Valley investors and advisors also participated in the formation and growth of mobile phone portals **KongZhong**, **Linktone** and **Tencent**.

Competition and cooperation in the sector have intensified simultaneously. In 2004–05, for example, Google and Baidu had an estimated combined market share of 90% and Google had taken a 2.6% stake in Baidu with an eye toward possible acquisition. Baidu's IPO took the two companies in different directions, and Google sold off its stake. Google, meanwhile—which has taken the name Gu Ge (“Valley Song”) in China—provides its search platform to portal rivals such as Chinese-language gaming and media portal NetEase, and Hangzhou-based business-to-business (B2B) e-commerce platform **Alibaba.com**. Hewlett-Packard has struck deals to load Baidu on its computers sold in China, and provide Shanda with MP3 players that it sells under the Shanda EZPod brand.

Yahoo! acquired a 40% stake in Alibaba, in a 2005 deal valued at \$1 billion. Alibaba, formed in 1998 by a former English teacher and government translator, Jack Ma, brings to the table one of China's largest business databases; a B2B trading, advertising and auction site for small and mid-size businesses that bypasses costly Chinese distributor networks; and, most recently, the **Tao-bao** (“digging for treasure,” in English) consumer auction site competing directly with eBay. Menlo Park-based Granite Global Ventures, along with Yahoo!, is an early investor in Alibaba, which has its U.S. headquarters in Fremont. John Wu, a core member of Alibaba's management team, previously worked at Oracle and developed Yahoo!'s first search engine.

Yahoo! has, in turn, handed over management of its Yahoo! China unit to Alibaba for local control, providing access to a sophisticated global search engine, email and advertising platform. Previously, Yahoo! had acquired 3721 Network Software, a Hong Kong firm offering the most used Chinese-language internet directory, and software that enables users to type in Chinese-language keywords to access Roman-alphabet domain names.

Ties That Bind

Looking to tap into China's large domestic talent pool, Google tapped Microsoft vice president for interactive services, Dr. Kai-Fu Lee, in late 2005 to establish an R&D center in Beijing. Dr. Lee, an engineer and expert in speech recognition technology and interactive media who had also served in senior management at **Apple** and **Silicon Graphics**, had previously recruited engineering talent from universities and research institutes to found Microsoft Research China. Google expects to have 150 engineers at the Beijing center by mid-2006, working on both Chinese and global projects. In March 2006 the company established a Taiwan center, headed by Dr. Lee-Feng Chien, a specialist in Chinese-language data management and retrieval, as well as language and speech processing.

Among Google's top priorities, according to vice president for Asia and Latin America Sukhinder Singh Cassidy, are expanding business-to-business (B2B) search to connect buyers and suppliers; furthering global business-to-consumer (B2C) advertising, particularly through its Adwords capability to target ads to users based on their search patterns; and enhancing the mobile phone/PDA search experience. The company is also competing head-to-head with Alibaba and others through a network of local resellers that encourage small business to list and advertise.

eBay has grown since the mid-1990s into a global auction and e-commerce site, with active communities in more than 30 countries. While the site was accessible and had grown in popularity in China during that time, eBay truly entered China through its two-part, \$180 million acquisition of a Chinese-language competitor **EachNet** in 2002–03. The two companies were integrated and launched as **eBay EachNet** in September 2004.

EachNet was begun in 1999 by two Chinese-born Harvard graduates with \$400,000 from friends and \$27 million in venture funding. It delivered to eBay 4.3 million loyal Chinese users as of 2003—roughly two-thirds of China's online auction market, worth \$230 million. Many of them, in fact, were reliant on the internet site for their livelihoods. With layoffs from restructuring of state-owned enterprises, the massive rural migration to cities in search of work, and limited shopping and transportation options in rural provinces, large numbers of users found work on the internet buying and selling clothing, cosmetics, office equipment and other products.

Chairman and CEO Shao Yibo told Business Week magazine in 2004 that EachNet used a government database of national identity numbers to create a seller verification system; courier services sprang up to compete with the postal system for deliveries; buyers used banks and post offices to wire payments. In 1999, nearly 90% of EachNet's business was within the Shanghai area; by 2004 major cities accounted for barely half of transactions, and most sales were between cities and regions across China. eBay brought to the table global marketing reach and name recognition, as well as technology to improve feedback, fraud detection, online payment and other functions. The merged entity started up with 6.9 million users.

Competition with Alibaba's Taobao site was immediate beginning in 2003, and has intensified steadily since then. Building on its initial \$12 million investment, Alibaba committed another \$42 million to Taobao in 2004 to increase security and upgrade the payment system, including tie-ins with Visa and Industrial and Commercial Bank of China. It has expanded into business-to-consumer (B2C) arrangements with retailers, to match eBay and Amazon.com's Joyo. When

eBay lowered its auction transaction fees, Taobao eliminated its fees through 2008, forcing eBay to follow in early 2006. This has made monetizing auctions more difficult. Efforts by Taobao to charge premiums for value-added ranking of sellers and prominently placed ads have cost the service users and prompted public protests. In 2005 eBay committed another \$100 million to the China market, mainly for marketing and advertising. Its **Skype** voice-over-internet protocol (VOIP) service, offered in China through **TOM Online**, claims 13 million registered subscribers, making China Skype's largest market.

China is a key part of eBay's global strategy. The company's international revenues grew from \$29 million in 2000 to \$1 billion in 2004. At stake are China consumer-to-consumer (C2C) auction revenues estimated at \$1.1 billion annually in the first eight months of 2005. eBay claimed nearly 18 million registered users at the beginning of 2006, to Taobao's 14 million. The China Internet Network Information Center, a quasi-governmental internet research group, estimated in May 2006 that Taobao holds a 67% C2C market share to eBay's 29% among some 2 million users in the Beijing, Shanghai and Guangzhou markets, measured in terms of transaction value.

As Chinese internet portals escalate competition and add new services, Bay Area entrepreneurs, venture funds and angel investors are participating in a flood of new, small companies handling online payment (**YeePay**); a Chinese version of the popular My Space internet community (**51.com**); job search (**51job.com**); travel reservations (**Ctrip**); dating (**Heiyou**), games (**Shanda, The9**); gourmet guides (**dianping.com**), and other add-on features using technology common in the U.S., but each representing opportunity in the high-growth China market.

Another growing web service is on-line gaming. Redwood City-based **Electronic Arts** (EA) has moved its global on-lines games operations to Shanghai, largely to thwart piracy. Electronic Arts' strategy is representative of a new approach by U.S. companies to addressing the problem of rampant piracy, particularly of media products: adapt your business model. Packaged video game discs that are played on computers or consoles are easy to copy. Traditionally, the U.S. entertainment industry has enlisted government support to seize and destroy pirate discs. Still, while large numbers have been destroyed, only a small dent has been made in the overall problem—cutting deeply into profits.

By selling on-line games in China from its China studio, to subscribers connected in their homes or at internet cafes, EA plans to turn its product into a service. The company is tapping into a market that is already booming, with scores of local companies. Forecasts indicate that China's on-line game market will grow from \$540 million in 2005 to \$1.7 billion by 2010.

Information Technology/Computing

Market environment

As China's economy grows, it confronts the same productivity constraints—in manufacturing; in delivery of financial, health care and government services; and in transportation/logistics, retailing, energy and telecommunications—as the U.S. economy encountered decades earlier.

Ties That Bind

Information technology (IT) services now reach far beyond traditional internal data and communications networks, to include:

- Mobile office solutions such as secure mail/internet access, and salesforce or field force access to networked company files, forms, data or collateral materials.
- Location-based services, from online restaurant and travel guides to retail marketing, that sends special sale alerts to a user's phone when the user passes a particular store.
- Smart identification and debit cards, and secure mobile payment.
- Smart monitoring of utility power grids and phone networks.
- Web-based customer relations management (CRM), project management, database, data storage, conferencing and other business services, geared to small and mid-sized firms.
- Electronic data interchange (EDI) or web-based supply chain services such as shipment tracking and tracing, documentation, scheduling, exception alerts and management reporting.
- Setup and/or operation of internal or outsourced back office functions (i.e. customer call centers, processing insurance claims or mortgage applications, medical records maintenance, etc.).

From enterprise and customer relations management software, to back office automation, to wireless voice and data networks, Gartner Dataquest valued the 2005 China IT services market at \$8.9 billion. Software sales totaled \$3.96 billion. Businesses spent \$390 million on IT outsourcing, according to Analysys International, with 84% of spending on IT operations and maintenance; 12% on IT applications and management; and 4% on help desk functions.

International Data Corp. (IDC) forecasts 21.5% compound annual growth from \$3.6 billion in 2003 to \$9.6 billion in 2008; IBM forecasts 15.3% average annual growth through 2008 and predicts significant growth in enterprise data traffic over wireless computer and phone networks. At a projected \$11.6 billion in 2010, the China IT market will be the largest in Asia (excluding Japan). IT services demand in China has risen steadily as 1) foreign firms seek custom solutions for selling, distributing and providing after-sales service in the China market; 2) Chinese firms seek productivity improvements to help manage rapid growth, ramp up for acquisition or listing or become global brands; and 3) China emerges as an outsourcing center for software development.

India is best-known as a center for software development and outsourced IT services, but China is gaining, thanks to low office rents and wages in places like Xian and Hangzhou (half that of Beijing and Shanghai and 10% of the cost in developed countries), government tax incentives and lower worker turnover. Increasing migration of business services to the internet also protects intellectual property relative to traditional physical software sales and installation.

WTO membership, the upcoming 2008 Olympic Games and the 2010 World's Fair in Shanghai are helping to drive IT services development, according to the Outsourcing Institute. Five factors have been central to growth:

- Zero duty on 251 items related to IT product development.
- China's market size and influence on global technical standards.
- Tougher intellectual property enforcement, beginning in late 2004.

Bay Area-China Trade: Behind the Numbers

- Potential for Chinese IT firms to achieve global scale through mergers and acquisitions (M&A).
- A growing IT talent pool including 2 million software developers, 5.86 million engineering graduates and returning U.S.-educated entrepreneurs.

Bay Area Connections

Hewlett-Packard's (HP) history in China dates back to visits by company co-founder David Packard in 1977 and 1979, the latter including an HP-sponsored engineering delegation and technical seminar. Packard signed a 1980 memorandum of understanding with Office for State Commission for National Defense industry vice director Zou Jiahua, and HP first opened a representative office in November 1981. HP's full board met in China in 1983 for the signing of a memorandum of joint venture with then Shanghai Mayor Jiang Zemin, leading to the first Sino-U.S. high-tech joint venture, China Hewlett-Packard Co., Ltd., in 1985.

Today HP has more than 5,000 employees in China, in PC, laptop, notebook and printer manufacturing; equipment leasing, through a joint venture with Shanghai Alliance Investment, Ltd.; and IT services through a network of 9 regional and 28 city offices, plus 27 service support and 200 "golden service" centers. HP also sponsors business, IT and software engineering schools in Beijing, a Dalian Global Delivery Operations and Solutions Center, an investment arm, a global software engineering center in Shanghai, and HP Labs, a Beijing R&D facility opened in October 2005.

In 2004 HP and Intel opened a joint Industry Innovation Center in Shanghai to promote new technologies developed for the finance, manufacturing, public sector and telecom industries. HP's scientific testing and measuring spinoff, **Agilent Technologies**, began operating independently in China in 1999 and formed a telecom R&D operation in Beijing in 2003. China is currently Agilent's second largest market.

China-based tech consulting firm Analysys International places HP as the number two provider of IT services in China with 8.4% of the market in 2005, behind only IBM with 9.3%. In 2001 HP bought a 7% stake in Aspire Holdings, a Hong Kong-based wireless data systems, service and gateway integration company majority-owned by China Mobile. The relationship expanded in 2005, when HP and billing software/services firm Amdocs developed billing software for another China Mobile subsidiary, Beijing Mobile.

A strategic partnership with Chinese online gaming firm Shanda Interactive, announced in April 2006, will bundle Shanda's EZ Pod—software and a remote control that upgrade a standard PC into an online gaming and internet console—with HP's home digital entertainment center infrastructure. Finally, HP is increasingly mining its database of technology patents, with licensing agreements making up a growing segment of total business.

In recent years the firm's sourcing activities in Taiwan have evolved from contract manufacturing to higher-value R&D and original design manufacturing, as well as some original equipment manufacturing. This is primarily due to migration of the Taiwan suppliers' basic assembly

Ties That Bind

operations to lower-cost mainland factories. Similarly, HP's Hong Kong presence has slowly diminished as the mainland PRC has opened to foreign business.

Dublin-based **Achievo Corp.**, formed in 2002, grew out of a partnership between two presidents of the Asian American MultiTechnology Association: Dr. Robert P. Lee, a veteran of IBM, Symantec and Computer Sciences Corp., and CEO of Inxight Software Inc., a Xerox PARC spinoff; and Sandy Wai-Yan Chau, a UC Berkeley graduate in chemical engineering and technology entrepreneur who founded San Jose-based Universal Semiconductor in 1977 and whose firm Trident USA has been active since 1984 in real estate and venture capital investment throughout greater China and the U.S.

Achievo, an offshore global software and IT services provider, saw opportunity in China amid the Y2K crisis and bursting of the dot-com bubble. While India had established a reputation beginning in 1999 as the location of choice for outsourced software development as well as call center and other outsourced back office functions, those activities were heavily concentrated in only three cities and the number of qualified engineers was limited. By contrast, China has thousands of small software outsourcing companies (fewer than 50 employees) dispersed throughout the country, with better air, road and telecom connections.

Chinese software coders earn the equivalent of about \$300 a month, less than a tenth of what U.S. programmers are paid, and China has 400,000–800,000 skilled software professionals. This potentially translates into more workers to throw at a problem at lower cost, with a shorter time to market. Clients include IBM, HP, Sun Microsystems, Hitachi, Toshiba, DaimlerChrysler and the China Academy of Sciences.

Of Achievo's 1,000 employees in 12 offices worldwide, 80% are in 6 mainland China locations: Shenzhen, Guangzhou, Dalian, Beijing, Jinan and Shanghai. The remainder are in the company's Germany, Japan, Taiwan and Canada offices, and its the Dublin headquarters. Achievo sees clear advantages in remaining a Northern California company:

- The headquarters bridges European and Asian time zones.
- The management team is bicultural.
- Clients can do business under U.S. law.

Achievo has pursued a strategy balancing organic growth with acquisitions. In November 2005 it expanded its southern China presence by acquiring Jeyo Computer Technology Ltd., a Guangzhou software and IT services company with a focus on telecom and wireless applications, and customers such as Guangdong Telecom, Huawei, Oracle and Microsoft. In March 2006 it expanded into Taiwan with acquisition of software and IT outsourcing firm VisualSoft, which brought to the table a focus on the banking services sector and mainland resources across the Taiwan Strait in Jinan. An April 2006 acquisition of Shanghai Wintech Software Co. Ltd. strengthened Achievo's northern China operations and additionally takes advantage of Shanghai Wintech's extensive Japanese customer base.

Cisco Systems entered the Asia market in 1994, with operations throughout the region, including Hong Kong and Beijing. As elsewhere in the world, Cisco has provided the routers and

switches making up China's internet backbone. Contract manufacturers in China, Thailand and Malaysia augment Cisco's own Asia manufacturing center in Hong Kong. A Cisco research and development center in Shanghai serves both Cisco's global activities and specific product localization and development goals within China. Among the company's mainland projects:

- A \$40 million project launched in 2001 to expand China Unicom's voice-over-internet protocol (VOIP) network to 321 cities in 30 provinces.
- A 2002 project to expand China Telecom's northern ChinaNet IP network, bringing multimedia and private network capability to 10 provinces, including Beijing and Tianjin.
- Phased development, beginning in 2004, of an integrated nationwide data network, including data centers in Beijing and Shanghai, for Agricultural Bank of China.
- A 2004 contract to merge the Industrial and Commercial Bank of China (ICBC)'s Beijing and Shanghai data centers into a national center to receive and process real-time transaction data from branches, ATMs and point of sale (POS) terminals.

Looking at greater China, Cisco has included among its customers Taiwan Cooperative Bank and Chunghua Telecom in Taiwan, and Hong Kong Cyberport and Hong Kong Broadcom.

More recently, Cisco has been active in the next-generation wireless segment, signing a cooperation agreement with Chinese telecom provider ZTE Corp. in November 2005. Cisco's CRS-1 scalable multi-chassis carrier routing system, which upgrades network capacity from 2.5 to 40 gigabits per second and improves network reliability, has won customers such as Shanghai Telecom and the China Education and Research Network (CERNET). Finally, Cisco sees opportunity in broadband traffic management—the ability to differentiate, optimize delivery of, and efficiently charge for different content (games, music, video, messaging) on a network. As a result Cisco acquired Sunnyvale-based IP service control firm P-Cube in 2004. In February 2006 it bought a 9.7% stake in Chinese online game developer Shanda Interactive—a move that better positions Cisco to address quality-of-service and pay-per use issues associated with multi-player interactive gaming.

Two other firms with extensive China presence deserve mention: **Sun Microsystems Inc.** and **Oracle Corp.** Sun made its initial foray into China in 1987, with offices in Beijing and Hong Kong. It has since added technical support centers in Guangzhou, Shanghai and Chengdu. The network enterprise equipment and software provider has focused on high-profile educational and government partnerships to widen usage of its products and services. These include:

- A \$15 million deal in 1996 with China Internet Corp. (CIC) to provide servers and other equipment, network security and management software, and the Java desktop and enterprise software development platform.
- A live telemedicine link, during President Bill Clinton's 1998 China visit, enabling UCSF-Stanford Health Care pediatricians and doctors at Xian Medical University to consult on critically ill patients.
- A 2000 collaboration with the Digital Television Industrial Alliance of China—an industry group of manufacturers and research institutes—to develop an interactive digital television specification for China's television industry based on Sun's Java TV application programming interface.

Ties That Bind

- A \$1.6 million donation of Sun networking systems in 2001 to China's Ministry of Education, for installation in 10 nationwide distance learning centers, and a 2002 donation of the open-source StarOffice software suite for distribution by MOE and unlimited use in schools.
- A \$115 million program with Taiwan smart card systems integrator TECO Electric & Machinery Co. in 2002–03 to develop a paperless medical record/claims processing system for the Bureau of National Health Insurance of Taiwan, issuing 22 million medical insurance ID cards to Taiwan citizens.
- A 2003 agreement with the China Standard Software Co., a tech consortium, to establish Sun's Linux-based Java Desktop system as the industry standard across China, installing up to 1 million copies annually nationwide.

Oracle Targets Mid-Sized Business

Oracle first established a China presence in the early 1990s. Today it has R&D centers in Shenzhen and Beijing, opened in 2002 and 2003; mainland representative offices in Beijing, Shanghai, Guangzhou and Chengdu, plus offices in Hong Kong, Taipei, Hsinchu and Kaoshiung; and plans to open its 18th worldwide global support center in Dalian, to provide customer service and technical support to customers in the PRC, Taiwan and Korea. In October 2005 Oracle China had some 800 employees.

China has grown to become Oracle's second largest Asia market, behind only Japan. Among its larger customers are China Mobile, China Telecom, Baosteel, Huawei, Bank of China, Industrial and Commercial Bank of China, China Airlines, Shanghai Power and Xinhua News Agency. Some of its midmarket accounts include Shangdong Provincial Hospital, Xiamen City Commercial Bank; Sha'anxi Gear Factory, Xi'an Aero Engine, Nanjing Normal University and Changjiang Waterway Bureau's Nanjing branch.

Extending Oracle's products and services to small and mid-sized businesses, and to Tier-2 cities with populations of 2–30 million, is a top priority for the company. Oracle cites a National Development and Reform Commission study estimating that small and mid-sized businesses employ 75% of urban workers and account for 50% of the nation's GDP, and has launched a program targeting such businesses in 26 cities with economic growth rates well above the national average.

A 2003 strategic alliance with Chinese Linux software/applications developer, Red Flag Software Co., has produced a lower-cost, streamlined and secure version of Linux to run Oracle database and other software—particularly its E-Business Suite China Special Edition—for smaller businesses and government agencies. Oracle now plans to hold technology forums in the 26 cities, as it builds a network of independent software vendors (ISVs) in targeted cities to expand geographic coverage and penetrate vertical industries. A Shenzhen-based center provides support for ISV application development.

Oracle's Beijing R&D facility is working on location-based, geographic information services; e-government solutions; and wireless applications and solutions. Under a memorandum of understanding with property developer Shui On Land, Oracle will develop and showcase digital com-

munity technologies at the Knowledge and Innovation Community, part of a Shui On development in Shanghai's Yangpu District. Oracle's China Graduate Development Program, established in 2002, offers training for university graduates. In all, Oracle contributed more than \$200 million in software and training as part of its Golden China Initiative during 2002–05.

Oracle CEO Larry Ellison was an early investor in two other Bay Area firms looking to expand into China: **Salesforce.com**, a San Francisco-based online provider of customer relations management (CRM) software mainly for small and mid-sized businesses—although Deutsche Post, Merrill Lynch, Nokia, America Online, Dow Jones Newswire and others are also customers—and **NetSuite**, a Sunnyvale provider of hosted enterprise and CRM applications for mid-sized companies.

Moving Software to the Web

Salesforce.com was started in 1999 by former Oracle executive Marc Benioff. The company offers a suite of 'plug and play' salesforce productivity and CRM applications over the internet, eliminating the need for costly hardware, software development and training. Salesforce.com offers Chinese and Korean language versions of its programs. Its Sforce and Customforce options allow customers and their other software vendors to customize and integrate applications; the AppExchange product allows software developers to create and sell new customized applications over the Salesforce.com architecture.

According to chief strategy officer and senior vice president Tien Tzuo, in a 2005 presentation at the UC Berkeley MBA Asia Business Conference, Asia—excluding Japan—accounts for about 5% of Salesforce.com's business, but is a fast-growing market. The company benefits from its online structure, allowing its customers and subscribers to learn and access productivity and customer relations management (CRM) applications via the internet, via mobile phone and iPod as well as a computer. When Salesforce.com entered the China market, Tzuo said, there was no legal definition for its business. Opening a China data center, as the firm had planned, would have classified Salesforce.com as a telecommunications company and required 51% Chinese ownership. The servers remain offshore.

San Mateo-based **NetSuite**, established in 1998, posted \$70 million in 2005 revenue. Half of its 7,000 customers are businesses with fewer than 100 employees. NetSuite offers small and mid-sized businesses e-commerce and CRM solutions over the internet, including accounting, customer support, order fulfillment and online payment. Net Suite has offices in Hong Kong and Singapore, and launched in Japan in March 2006. It plans to enter China by yearend 2006.

Sybase, headquartered in Dublin, provides open-architecture client-server and mobile enterprise software solutions for the financial services, government, communications and health care sectors. It was launched in 1984 in Berkeley, and today has more than 3,700 employees worldwide and 40,000 corporate customers in 60 countries. The company has R&D centers in Beijing, Shanghai and Xi'an; provides 24/7 customer support through offices in those cities plus Hong Kong, Taiwan, Guangzhou and Chengdu; and utilizes more than 150 China partners. Among recent Sybase China projects:

Ties That Bind

- Modernizing China Telecom's internal network management system across 23 cities and provinces in Southern China.
- Linking China Ping An Insurance Co.'s 200,000 agents to the head office and central database via wireless network, enabling remote policy registration, insurance data and account access, customer service and premium payment.
- Streamlining paperwork and information flow for tracking and monitoring cases within Beijing's three-tier system of 21 judiciary courts.
- Developing a computerized ticket sales and reservations system for the Ministry of Railways and a passenger system involving 5,000 stations and 2,000 trains operating daily.

Apple Computer's history in Greater China dates back to the mid-1980s, having less to do with direct sales than with Taiwan-made counterfeits of the original Apple IIC personal computer. Long before introduction of Intel dual-core processors in its new MacBook models, a Taiwanese knockoff, the Lemon, ran dual Apple and Microsoft DOS operating systems, to evade U.S. Customs inspectors looking for patent violations by turning on the computers. Apple has vigorously protected intellectual property and enforced premium pricing on its products worldwide, leading to slower but nonetheless steady growth in China.

Apple has a network of 12 China resellers; two retail outlets in Hong Kong, with plans for three larger stores; and an outlet each in Beijing and Taipei. Seven-Eleven stores in Taiwan also sell iPod minis. Three Taiwan original equipment manufacturers—ASUSTeK, Quanta Computer Inc. and Foxconn Technology Group—manufacture Apple MacBook and desktop models.

Foxconn's Longhua factory near Shenzhen and ASUSTeK's Suzhou plant near Shanghai have made most of the 50 million iPod MP3 players that have sold worldwide since 2001, and were cited in June 2006 press reports of excessive hours and other violations of Apple's supplier code of conduct. The Shenzhen government has since ordered unionization of the Longhua facility. ASUSTeK is making Apple's new Intel-powered iBooks, using panel displays from Taiwan manufacturers AU Optronics and Chi Mei, as well as Korean makers.

In May 2004, Apple signed an agreement with Founder Technology Group in Shanghai, China's second largest personal computer maker, under which the iTunes digital music jukebox software is pre-installed on every Founder PC.

Computer-aided design (CAD) software maker **Autodesk**, headquartered in San Rafael, has its Asia-Pacific regional headquarters in Hong Kong, and greater China representative offices in Beijing, Shanghai, Guangzhou and Taipei. While the company has branched out in recent years to tap new markets such as entertainment and public health—its film pipeline animation, visual effects and color grading package was used in post-production for the 2005 Chinese feature *Seven Swords*, and its MapGuide visual mapping and display software was used to map the spread of the SARS virus on public information web sites in 2003—about half of its greater China revenues come from the construction and engineering sector.

Autodesk has combined its Buzzsaw project management suite with Japanese construction and civil engineering firm Maeda Corporation's Naoshiya Matabee facilities management service to

manage and share project and facilities data—permits, schedules, estimates, budgets, inspection reports, construction and design documents—across Seven Eleven’s network of 10,000 stores in Japan. Seven-Eleven has brought the two companies in to help implement its expansion into China. AREP, a French engineering design and architectural firm affiliated with SCNF, the French Rail Board, has used Buzzsaw to communicate, share documents, simultaneously review and modify plans, and otherwise collaborate with Chinese local design institutes over a secure, multilingual platform, on projects such as the Beijing Museum and the Shanghai Railway Station.

The Chengdu Hydroelectric Investigation and Design Institute (CHIDI) utilized Autodesk’s Civil 3D mapping and design modeling program to visualize and analyze the terrain and rock structure of the steep mountain gorge along the Yalong River, in the construction of the Jinpin Hydro-power Plant. The \$2 billion phase one project includes a 3,600-megawatt power station and a 305-meter double-arched dam, the world’s largest.

Autodesk began shifting its software to a server-based subscription service for the Asia-Pacific region in 2003—a step that has helped simplify licensing, enable secure communications, offer fast access to upgrades and better protect intellectual property.

Architecture/Engineering/Urban Planning/Construction

Market Environment

In 2005 China saw completion of an estimated 4.7 billion square feet of construction, up from 2 billion in 1998. This included multi-use highrises, government complexes, hotels, shopping malls twice the size of any in North America, central business districts, even entire neighborhoods and towns built from the ground up with parks, civic buildings, schools, stores and artificial rivers and lakes.

Shanghai alone has more than 4,000 skyscrapers (buildings over 18 stories high)—nearly double the number in New York—and has another 1,000 on the drawing boards or under construction, and scheduled for completion in this decade. By 2010, less than 5% of the historic city will remain, and much of that will be in renovated districts like Xintiandi where old facades front restaurants, nightclubs and tourist shops.

China is working to remake its urban centers: in preparation for the 2008 Olympic games; to accommodate the 140 million rural Chinese that have flooded into cities along the Yangtze and Pearl Rivers in past years, and the 75 million more expected to follow by 2010; to provide a business infrastructure and standard of living that will attract and hold successful entrepreneurs; and to accommodate foreign firms setting up offices and research campuses, and expatriate managers looking for high-end housing. Construction now underway reflects years of pent-up demand after the 1997 economic crisis, and later the SARS and avian flu outbreaks, dampened business activity throughout Asia.

Where property development was once driven exclusively by government ministries and state-owned firms, regulations in 1992 and 2004 clarifying private property ownership brought foreign

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firms into the market. Land is still owned by the state, with use granted under long-term lease. Ownership of a building is typically set up through a wholly foreign owned enterprise (WFOE). Foreigners may now invest directly in properties without bringing in a local partner, although a well-connected partner may still be helpful in handling issues such as transfers, inspections and taxes.

Japanese and Taiwan investors and developers arrived in the 1990s, following the massive off-shore migration by key industries to China's lower-cost environment. More recent arrivals include U.S. developers such as Simon Properties and Hines Interests, pension funds, real estate investment trusts, insurance companies and investor groups led by Goldman Sachs, Merrill Lynch and Morgan Stanley (Goldman, Morgan Stanley and Australia's Macquarie Bank reportedly invested a combined \$450 million in four Shanghai commercial buildings in 2004; Merrill Lynch announced in February 2006 a \$30 million investment in Beijing's tallest building, the Beijing Yin Tai Center). The California Public Employees' Retirement System (CalPERS) has created a joint \$400 million fund with U.S. developer Hines Interests to develop residential and retail properties in China. It also has China exposure through a \$200 million investment in Secured Capital Group and a \$400 million investment in AETOS Capital.

China's State Administration of Foreign Exchange (SAFE) reported a total \$3.4 billion in foreign real estate investment during 2005, and the Ministry of Commerce reported another \$1.5 billion in first quarter 2006—up 47% from the same period in 2005. Much of that was in commercial offices, upmarket housing and industrial properties, where Citigroup reports an average annual return on investment of 7%, compared with 4.5% in the U.S., 4% in the United Kingdom and 3.5% in Japan.

Many Bay Area investors, mostly Chinese-Americans, are investing in China real estate—especially condominiums. Development and investment opportunities are spreading out to second-tier cities like Chongqing, Chengdu and Dalian. China's property market—especially housing, which saw prices rise 15% in major cities and 5.5% in medium-sized cities in first quarter 2006—is so hot that government has stepped in to curb real estate speculation with higher interest rates, a 5% transfer tax on property held less than five years, and a more recent 35% capital gains tax.

Foreign architects are higher cost than domestic Chinese architects, but their names carry experience and prestige. While local firms design most projects and buildings, overseas firms compete at the high end of the market, particularly on high visibility, signature developments. China has embraced western design practices since the quality of design services performed by local professionals is not yet at a level of maturity to deliver Class A international buildings. Significant price differentials, primarily in labor costs and in shorter lead times required to break ground, have resulted in a highly advanced market, often incorporating new building technologies that have not yet been implemented in the U.S. Much of the competition in that market segment comes from German and French firms.

Because land is owned by the government, public projects are awarded by government-sponsored competition. Private development projects entail a "scheme gathering" solicitation to design firms to prepare concepts. These are submitted to "expert" panels who evaluate and rank

design concepts for creativity, relationship to context and constructability. Top finalists receive stipends; winning design firms have an opportunity to negotiate to provide further design services. While the process is generally open and transparent, as with everything in China, relationships can be important.

Foreign architects are currently limited to presenting preliminary designs, providing aesthetic, structural, materials, energy-efficiency, spatial use and other expertise to “local design institutes” (LDIs) of architects, construction engineers and building code compliance specialists. Requested drawings may be only 50–75% complete, compared to detailed plans submitted in the U.S., allowing flexibility for the LDIs to lock in a final design. A developer may continue to retain a representative of the foreign firm through the construction phase to work with the LDI, or may terminate its relationship once drawings are submitted. Likewise, foreign construction firms can serve as general contractors, but the actual construction work is subcontracted to local firms.

At times the process has produced creative tensions as the original design concept is dramatically changed to lower costs, address code issues or put the developer’s or LDI’s creative stamp on a project. Still, partnerships between foreign architects and LDIs are being institutionalized, and China is becoming an increasingly important market for many Bay Area design firms.

Bay Area Connections

Despite the constraints, architects find China an exciting market. Developers and investors embrace unique, landmark designs. Safety codes are strict, but interesting use of space, materials and green design are welcome. Projects move through the approval process in months, not years. Low labor costs change the economics of large scale, multi-use projects, whether a highrise tower or a new community. And foreign architects have only scratched the surface of the China market. Nearly 100 cities in coastal areas and along the Pearl and Yangtze Rivers boast populations of more than 1 million and are growing. Many of the largest signature construction projects in China—from skyscrapers and commercial districts to resorts and planned communities—have been designed by Bay Area architecture and urban planning firms.

Architects

Gensler Architecture Design & Planning had a Hong Kong presence for years, serving primarily international clients there and in China. But as the China market opened, as Northern China emerged as a new global business center, and as currency convertibility and taxes became less of an issue, Gensler opened a Shanghai office in 2002. The office’s staff of 30 consists mainly of local hires, and is structured as a wholly foreign-owned enterprise. Gensler principal Ray Shick says the firm is committed to building a stand-alone entity that will generate business on its own, with occasional specialized support from the Gensler team worldwide. Down the road Shick sees partnerships with Chinese LDIs and with engineers who have left LDIs to form their own design firms, to bid for projects. For now, many Chinese clients prefer to have the most important design work done abroad.

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Gensler has designed some 60 projects in China. Fiscal 2005 China revenues totaled around \$6 million. Among its signature projects, all in the Shanghai area, are a sustainable high-tech campus design for Shanghai Pudong Development Bank; the Wangbaohe Central and Pudong Hotels; the Soufa and Shanghai Shimao Sheshan Hotel and Conference Centers; and the 400,000-square meter Nanjing Road West master plan to revitalize the western third of Nanjing Road as an up-scale shopping street, while creating five new districts and preserving historic sections.

Skidmore, Owings & Merrill (SOM) has completed, designed, or has under construction some 100 projects in China, and the China market has accounted for nearly one-third of the San Francisco office's annual revenues since 2000. SOM's first project in the country was the Industrial and Commercial Bank of China headquarters building in Beijing in the early 1990s. Subsequent projects included the Suzhou International Convention Center; the Lenovo corporate headquarters in Zhongguancun, Beijing; the *Architectural Record/Business Week* award-winning Jianianhua Center in Chongqing; and the 88-story Jin Mao Tower in Shanghai's Pudong commercial district, which features 50 stories of offices, a 555-room Grand Hyatt Hotel on the top floors, and a six-story retail/theater/conference complex podium. The Jin Mao Tower is the tallest commercial building in China.



*Left: Jin Mao Tower,
Pudong District of
Shanghai
Artist Credit:
Gartner Photography
Source: SOM*

*Right: Jin Mao Tower
atrium.
Artist Credit: Heinrich
Blessing Photography
Source: SOM*

In the late 1990s, SOM partnered with Hong Kong developer Vincent Lo's Shui On Group to plan a seminal \$3.5 billion redevelopment of Shanghai's Taipingqiao district. The first phase of this project was a \$175 million preservation/modernization of the Xintiandi neighborhood, completed in 2002. The modest brick meeting hall in which the Chinese Communist Party was founded in 1921 was restored; the façades of other 1930s buildings were restored, and their interiors gutted, to accommodate restaurants and shops; and a neighborhood park and lake were constructed. The larger Taipingqiao project will be completed by 2010. Xintiandi is now a thriving entertainment district with restaurants, theaters, and clubs. The success of the master plan—and SOM's insistence that historic structures be preserved—set a new model for development and preservation in China that may help save similar districts and buildings in other areas.

Bay Area-China Trade: Behind the Numbers



*Shanghai Waterfront
Redevelopment Master Plan
Artist Credit:
Christopher Grubb
Source: SOM*



*Xintandi and Shui-On
Shanghai Luwan Master Plan
Source: SOM*

SOM also master planned a redesign of Shanghai’s waterfront (known worldwide as the Bund), embedding the idea of public access into one of China’s most vibrant areas. SOM’s approach to waterfronts—repurposing a traditionally commercial place so as to engage the public—was also evident in its redevelopment of Hong Kong’s central waterfront (1999), and its “green island” plan for Shanghai’s 750-square mile Chongming Island. The Chongming plan includes green transportation and other infrastructure, and preserves wetlands, forests, and agriculture.

SOM is working with local design institutes and contractors to set new technical standards for building, including a commitment to sustainable design. Three “green” buildings currently on the boards include the Nanjing Greenland Financial Center, a three-tower office, hotel and residential complex (2007); the dual-skin, energy-efficient 50-story Jinao Building nicknamed the “Infinite Tower,” also scheduled for completion in Nanjing in 2007; and the 69-story, solar and wind-powered Pearl River Tower in Guangzhou, headquarters for the CNTC Guangdong Co., to be completed in 2009.

Beijing Finance Street, a 22-building, SOM-master-planned hotel, retail, office and housing complex in the capital city’s financial district, is also currently under construction. The complex creates a new central business district for the city and will help welcome the world for the 2008 Olympic Games. Looking ahead, SOM has several projects in design, including a two-million

Ties That Bind

square-foot mixed-use development in Pudong (Shanghai); the headquarters for the Development Bank of China; and the China World Trade Center–Phase 3 in Beijing, which will be the tallest tower in the capital city.

SB Architects (Sandy Babcock), which specializes in residential and leisure/hospitality projects, entered the China market in 2002, after the 1997 economic crisis cut into its Indonesia business and September 11 curtailed global air travel and hotel/resort development. Since then, rural migration to China's cities, an emerging affluent business class in southern China and a growing expatriate community have spurred demand for housing and planned developments.

China accounted for 10–15% of 2005 revenues (\$17.5 million) for SB, which serves China primarily through its San Francisco office. It works frequently with Chinese developer Vanke Foshan Real Estate, which hired SB for its Western design expertise—most notably the Fisher Island planned community in Florida. SB has completed three of four phases of Vanke's Ban Xue Gang project outside Shenzhen, that will eventually include 3,000 residential units ranging from low-rise townhomes to 20-story apartment buildings, plus shopping, schools and civic buildings. SB has also finished two phases of the 341-acre Clifford Estates master planned community in the Guangzhou Urban District for developer Panyu Ltd. (5,743 housing units plus office, retail, schools and civic buildings), and is working on conceptual designs for the Song Shan Lake planned community outside Shanghai, with 2,500 residences, 250,000 square feet of retail, schools and day care facilities. It is in discussions for residential and hotel development at Mission Hills, an existing complex of ten 18-hole golf courses in Guangdong Province.

HOK operates a network of country offices across Asia, through its Hong Kong-based HOK Asia Pacific International unit. The network also includes offices in Beijing and Shanghai. HOK has taken a cautious approach in Asia, a market known for middlemen offering government or developer connections to large projects in exchange for a finder's fee, and deals that can suddenly evaporate. HOK therefore insists on 25% of the project fee in advance and will stop work when payments are past due 30 days.

Asia accounts for a relatively small part of HOK's annual revenues worldwide, but it is the fastest growing. Asia business has doubled in the past two years and is likely to double again by 2009. China represents 10–15% of HOK's San Francisco office business, which averages \$1–2 million annually.

HOK has designed a campus for Motorola that is now under construction in Beijing's Economic and Technological Development Zone, including a 20-story office tower and a 65,000-square meter shared service center. A mixed-use residential/retail project in Suzhou broke ground in July 2006. Also in the works: a beachfront corporate housing/conference center complex in Hainan. Past projects include the 25-story China Resources Building near Tiananmen Square; the 32-story Embassy House luxury townhome project for Hines in Beijing; four hotels in Shanghai, the master plan for Hong Kong's Kai Tak Airport, several master plans in Chongqing (Sichuan Province), and interiors for the Hong Kong offices of Henderson Land Corp., Lehman Brothers and Bloomberg News.

HOK Asia Pacific international managing director Toby Bath stresses that the competition for Chinese projects today is international, and selection is based on a range of factors from branding, to experience with technology and materials, to technique, to cost. The work can be grueling, with rotating design teams working 24 hours a day to produce design drawings for a large project in 6 weeks, as compared to the customary 26 weeks in other countries. Roughly half of HOK's China business involves local Chinese clients. Over time, the cache of western-style architecture has given way to a more distinct Chinese aesthetic that may include, for example, more space for lobbies and landscape grounds that lend themselves to ceremonial uses.

Still, HOK's San Francisco office has extensive involvement in China projects, and the Bay Area enjoys an advantage in worldwide competitions as a center for design innovation, sustainable environmental design, and experience with strict regulatory compliance and review processes.

Landscape Architecture/Environmental Design

Rural migration to urban centers in China, a shift from government-owned to private housing, and development of suburbs to ease urban congestion, are contributing to a need for improved urban planning.

San Francisco-based **EDAW Inc.** began working on projects in China in 1991, although its first office there did not open until 1999. Its first signature projects were for the Suzhou District, which lies northwest of Shanghai, and included design guidelines for the historic district of old Suzhou—in cooperation with the Pei Group—and a master planned waterfront community on 1,285 acres surrounding Jinji Lake.

Working for the Suzhou Industrial Park Administrative Committee, EDAW designers and planners from San Francisco, Seattle and Hong Kong produced an internationally recognized design for 8 distinct neighborhoods along the lake in two zones—one of high density and recreational activity, and the other more serene with preservation of natural canals, waterways, trails and a bird sanctuary. The overall aesthetic reflected Suzhou's 1,000-year history of garden design and arts such as sculpture and silk weaving. Automobile use is minimized with walking and bicycle trails encircling the 9-mile lake perimeter, and storm water runoff management protects the lake's water quality. The Jinji Lake District's 8 neighborhoods are expected to eventually house 600,000 residents.

In Quanzhou City in Fujian Province, EDAW is working for Quanzhou Luojiang Real Estate Co. on the Qiaonan Village Historic Preservation Scheme. The project will preserve historic buildings and add new construction in and around the 133-acre ancient riverfront settlement Qiaonan Village, midway between Shanghai and Hong Kong on China's eastern coast. Qiaonan was the starting point of the "Silk Road of the Sea," the maritime route from China to Europe via South Asia. EDAW's plan focuses on tourism, emphasizing history through preservation and use of original materials and design elements while adding a riverfront promenade, leisure and entertainment facilities and a connecting road to the mountains outside of town.

Ties That Bind

Other projects include:

- A master plan for a high-end residential resort community, and landscaping design for the Xianshan Peninsula Island Hotel Area, within the Thousand Island Lake National Recreation Area in Zhejiang Province.
- A wetlands master plan for the Shanghai Chemical Industrial Park project, in eastern China's Hangzhou Bay, where an industrial wastewater management system and wetlands is combined with programs for recreation and wildlife.
- The creation and enhancement of the Li Lake Parklands around Wuxi in Jiangsu Province, which includes a variety of open space systems and ecological design features.

Most recently, EDAW's Hong Kong and Beijing offices won a bid to master plan the 741-acre, \$95 million Shunyi Olympic Aquatic Park, where rowing and canoe/kayak competitions will be held for the 2008 Olympic Games in Beijing. Spectator pavilions will be designed in the shape of waves or dragon boats; a control tower and media pavilion will have the appearance of jade lanterns; a bridge of dragon boat oars will connect the entrance square and race course. Water from the Chaobai River diverted to the race course will be filtered, and the riverbank's original trees will be preserved during the event. The park is scheduled for completion in late 2007.

EDAW's experience with Chinese construction regulations helped them win the Aquatic Park bid. Almost all of the firm's China work today is driven locally, with EDAW's six Asia offices providing their own environmental management expertise and utilizing hydrology, ecology water and other specialists from China. At the same time, EDAW Asia has tapped into the valuable environmental expertise of the Bay area, using a strong connection to the U.C. Berkeley for consulting services on key projects.

A quarter of Sausalito-based **SWA Group's** total business is in China currently, and international business overall has accounted for as much as 40% since the mid-1990s. Much of the firm's China work is done out of the Houston, Dallas, Los Angeles and Bay Area offices in Sausalito and San Francisco. A Shanghai representative office was opened in 2003.

SWA began building a China presence in the early 1990s. Much of its work involves landscape architecture and urban design projects for local Chinese government agencies, to improve livability of cities as they become more densely populated or to promote tourism by enhancing historic and scenic sites. SWA also works as a subconsultant to international firms in China: It was the landscape architect for SOM's Beijing Finance Center project, and for some of the SB-Vanke residential projects mentioned above.

SWA's two most well-known projects have been Nanhai Citizens Plaza, a 240-acre mixed-use corridor with civic and commercial buildings, public parks, streetscapes and waterways, comparable in scale to New York's Central Park in Nanhai, a Guangdong Province planning area; and the Hangzhou Waterfront Urban Redevelopment Project on West Lake in Hangzhou's Hubin District, that redirects through traffic through a tunnel under the lake and develops the lakefront area for recreation and tourism.

Among SWA's other Chinese projects:

- A riverside park along Shanghai's North Bund Riverfront for the City of Shanghai, that accommodates river flooding conditions through use of active and passive spaces.
- The Luohu Land Port and Train Station, a border control and multi-transportation urban center in Shenzhen along the Hong Kong border, through which 400,000 people pass daily; urban design for the 89-acre redevelopment project includes a sunken garden and plaza, taxi station, light wells, underground driveway, people mover corridor, four city streets, a 400-meter long plaza and glass atrium.
- Urban redesign and landscaping for Tuen Mun and Sha Tin in Hong Kong's New Territories, two of nine new towns built since the 1970s on reclaimed land to absorb high-density population growth, whose populations have now reached a half million or more.
- Master planning and urban design of a 5,300-acre new town project in Qingpu, Shanghai that links three urban centers through a network of greenbelts and waterways, and provides for a residential district, park and adaptive reuse of an old cement factory as a cultural center on Qingpu Island.

Chief operating officer Scott Cooper says SWA sees long-term opportunity in the China market as urbanization continues. More than a quarter of its technical staff nationwide is from Asia, mainly Chinese-born, U.S.-educated architects who have remained in the country on H-1B visas, and SWA actively recruits from schools such as UC Berkeley, Harvard and University of Pennsylvania. Cooper adds that the biggest challenge for U.S. architecture and urban planning firms is finding talent—as the number of graduates in the field today is roughly what it was more than 30 years ago.

Post-9/11 restrictions have caused delays and complications, turning visa application into “a separate side business” for SWA. But as competition in China increases from domestic LDIs and firms started by their employees, SWA is counting on expanding its presence as a mostly local Chinese entity, as its visa recruits are trained and return home.

Construction

Only a relatively small percentage of **URS Corp.**'s \$3.9 billion in annual revenues come from China, but the San Francisco-based construction, environmental management and defense firm is well-positioned for future growth.

URS has taken a cautious approach in entering the China market, through a combination of acquisitions and organic growth. The firm's Shanghai office came with a 1996 acquisition of engineering firm Dames & Moore. Its Hong Kong office dates back to master plan, environmental assessment and engineering design work on the Chek Lap Kok Airport. A Suzhou office, with a staff of 55, came in 2005 with the acquisition of Austin Ausino Engineering Consultants, a leading design, project management and construction management firm in China. Austin Ausino's expertise was complementary to URS' existing capabilities in China, primarily in the area of environmental services. URS opened a Beijing office in June 2006.

Ties That Bind

The company's primary China business to date has been in environmental site assessments, cleanup and compliance. Many of URS' clients in China are *Fortune* 500 multinational industrial and manufacturing companies with operations in the country. It has provided support services for Motorola, 3M and Johnson & Johnson manufacturing facilities, and is helping IKEA site and build its stores in China under a master service agreement. The company also performs some work for aid projects through such funding entities as AusAID, the World Bank and the International Finance Corporation.

Currently, URS and Parsons Aviation have won a joint bid to design the Guangzhou Bayun International Airport, and URS is providing planning support for the Qingdao International Sailing Centre now being built for the 2008 Olympics and scheduled for completion in late 2007. The Centre is being built on the old site of the Beihai Shipyard on Fushan Bay, in Shangdong Province.

As the Chinese economy expands, URS expects to provide support for a variety of critical infrastructure, facilities and environmental projects, particularly in the power and water/wastewater sectors. In addition, China's announced plans to build as many 48 international airports in coming years provide valuable opportunities for URS to leverage its expertise and reputation from the Hong Kong and Guangzhou airport projects.

Bechtel's China Strategy: Think Big

Privately-held Bechtel Corp., based in San Francisco, has been active in Taiwan since 1963, beginning with a study for China Petroleum Corp. In 1979 it formed a 60-40 joint venture—Pacific Engineers & Constructors, Ltd.—with Taiwanese engineering research institute Sinotech, to assist in the development of Taiwan's nuclear power program.

Bechtel entered the mainland China market in 1979, and in 1984 established a 50-50 joint construction venture with the China International Trust & Investment Corp. (CITIC). Bechtel-CITIC Engineering, Inc. (BCEI) provides engineering, construction, procurement and project/construction management services in support of Bechtel projects, and to other clients. Bechtel was the first U.S. firm to receive a PRC general contract construction license, in 1994. Through BCEI it has a Class A engineering/design consultancy license and extensive contacts with government permitting and licensing agencies, development zones, design institutes, developers and suppliers. BCEI has completed more than 80 projects and 140 client assignments.



Projects typically involve industrial development on a massive scale. The most recent is the \$4.3 billion, 1,055-acre CSPEC Nanhai Petrochemicals Project, a 50-50 joint venture between Shell Petrochemicals and Chinese state-owned petroleum firm CNOOC at Daya Bay, Huizhou in Guangdong province. Near completion, the complex includes 11 units that will produce 2.3 million tons of ethylene, polyethylene and various polymers annually, supplying plastics products manufacturers throughout the Pearl River Delta and China's coastal economic zones. The complex has 56 buildings and includes its own power generation, waste treatment and other infrastructure. Bechtel partnered on the project with Sinotech Engineering Inc. (SEI) of China and Foster Wheeler Energy Ltd. of the U.K.

Other Bechtel projects in greater China include:

- Engineering and procurement services for the Qinshan Nuclear Power Project, two 700-megawatt plants on Hangzhou Bay in Zhejiang Province completed in 2004.
- Construction management for IBM's Surface Laminate Circuit High-Performance Chip Carrier Manufacturing Facility in Shanghai, including clean rooms, utilities and waste treatment plant, completed in 2003.
- A \$1.6 billion, 1 million-square foot Motorola chip manufacturing plant, including Class 1 clean room and microchip assembly/testing facilities, completed in 2001.
- China's first wholly foreign-owned power plant, the 724-megawatt Meizhou Wan project at Meizhou Bay on the East China Sea, completed in 2001.
- The \$20 billion Hong Kong International Airport Development, constructed over eight years from 1990–98, including a 34-kilometer transportation corridor with a high-speed rail system, six-lane expressway, tunnels and bridges.
- The joint Bechtel-General Electric Hsin Tao Combined Cycle Power Project, a 628-megawatt power-generating plant located in Taiwan.

Advertising

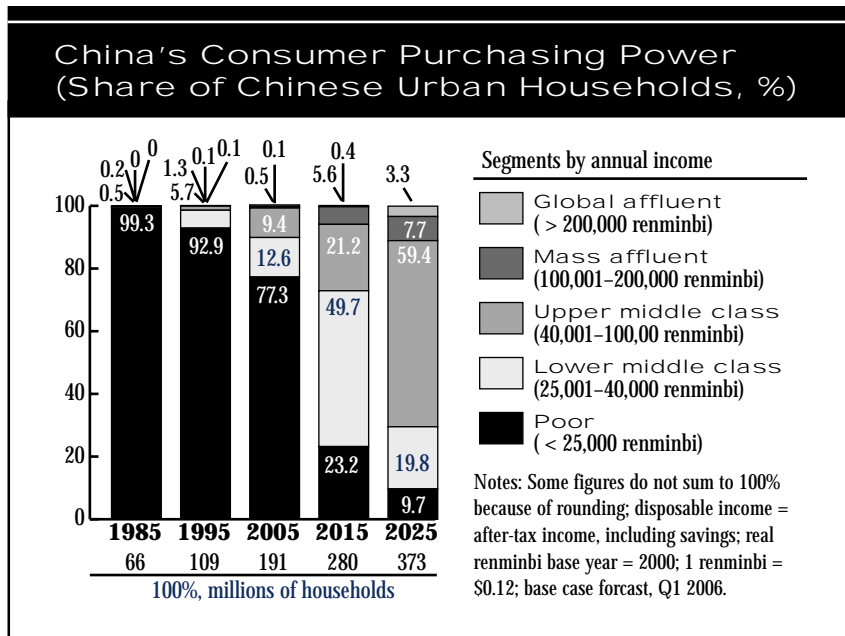
Market Environment

China lifted a nationwide advertising ban in 1979 as part of its initial opening, with an ad market in the first year of just over \$1 million—mainly newspaper ads for dry goods, food and herbal medicines.

Creation of special economic zones in the Pearl River Delta region and coastal areas raised living standards and created the beginnings of a middle class and consumer markets by the late 1980s. Major advertising firms like Saatchi & Saatchi, Ogilvy & Mather, J. Walter Thompson and Leo Burnett followed Procter & Gamble, Unilever, Coca-Cola, Colgate-Palmolive, Nestle and others into the emerging China market. Minority joint ventures were permitted. Early examples included DYR, a partnership of Young & Rubicam, Japanese agency Dentsu, the China International Advertising Co. and the China United Trading Co. in Beijing (1986) and Ogilvy & Mather Shanghai, a JV between O&M and Shanghai Advertising Corp. (1991). A 1995 Advertising Law laid out approved advertising standards and practices.

WTO membership liberalized the advertising sector by allowing majority-owned joint ventures in 2004 and wholly foreign-owned enterprises in 2005. It also lowered tariffs and opened up the China market to liquor, cars, electronics and other consumer goods coveted by increasingly affluent urban Chinese. At the same time, credit cards are gradually gaining acceptance and e-commerce has exploded. An auto boom has put a record number of cars on the road and boosted radio advertising.

Average per capita income in China is still around \$1,700 per year, with an average household savings rate of 40% to cover health care, college education costs, saving for a home and so on. Still, it is estimated that as many as 100 million Chinese constitute a middle class in the PRC, with annual incomes mainly in the \$3,000–5,000 range and a growing number of affluent consumers earning \$12,000–25,000 a year. McKinsey forecasts a middle class of 290 million by 2011, rising to 520 million by 2025; an affluent class remaining constant at about 40 million people over that same period; and a \$1.7 trillion consumer market by 2025. In 2005, retail sales in China totaled \$764 billion, up 13% from 2004.



Source:
National Bureau of
Statistics of China;
McKinsey Global
Institute analysis

Small wonder that China's advertising market has grown from \$2-3 billion in the mid-1990s to \$13 billion in 2003, close to \$24 billion in 2004 and more than \$30 billion in 2005, according to CTR Market Research (*Note: Numbers may be somewhat inflated, to the extent that they represent spending at published rate levels, before customary discounts*). Television ad revenues totaled just under \$5 billion in 2005, according to Xinhua News Service. Online advertising, including search engine ads, grew 78.4% in 2005 to some \$521 million, according to People's Daily online, surpassing both magazine and radio ads as a share of the total market. Outdoor advertising increased 79% in 2005 to \$1.7 billion. Firms spent an estimated \$487 million on market research in 2005, according to a recent China Daily report.

As in other sectors, foreign firms competing on service have found it difficult to penetrate the China market. Until recently most Chinese firms viewed advertising as an intangible cost, and did not value production quality and strategy; selected mostly local agencies based on price; did not pay on time; and often solicited ideas in pitches from foreign firms and then turned those ideas over to a local firm for execution. Local agency connections within companies helped ensure payment, and relationships with local media helped obtain 20-50% discounts off published ad rates. Gradually the market is evolving, but foreign ad agencies market primarily to larger, listed companies and while they have begun to win judgments against non-paying clients, they still occasionally have to take their cases to court.

Bay Area Connections

Advertising, marketing, public relations and other related services make up a significant Bay Area industry sector. China's advertising market is dominated by the large multinational firms and their Chinese joint venture partners, plus an estimated 80,000 smaller local and niche firms nationwide. Two cases, however, reveal interesting and unexpected linkages.

Ties That Bind

San Francisco-based **Dae Advertising** was formed in 1990 by a group of friends to serve what 1990 U.S. Census Bureau figures revealed to be a burgeoning Asian-American consumer market defined by relatively high disposable incomes, education and consumer expenditures. Dae worked with clients ranging from Miller Brewing to Wells Fargo Bank to Albertson's, tailoring campaigns to Asian-American tastes, aesthetics and aspirations.

Dae co-founder Wei-Tai Kwok notes that more than a third of the 12.5 million Asian-Americans in the U.S. are in California. Roughly 22% of the Bay Area's population is of Asia-Pacific origin, and about 8% are ethnic Chinese, according to U.S. Census Bureau 2005 data. That, he says, has led to a cross-cultural understanding here that aids businesses in tapping markets on either side of the Pacific.

Dae's first major Chinese client was 999 Pharmaceutical, a maker of powdered ginseng, echinacea and other herbal medicines owned by the People's Liberation Army. 999 hoped to establish a retail brand presence in the U.S. in 1996, and Kwok bought space on a huge billboard in Times Square promoting the company. Eventually 999 became a listed company and a supplier to health food store chains and pharmacies, and the sign remained prominent in Times Square for several years.

Dae also helped Hong Kong-based Vitasoy market its soy milk products in the U.S., by first selling to an Asian-American customer base. Kwok sees opportunity in large Chinese manufacturers trying to build global brand identity in the U.S., as Lenovo has done by purchasing the PC unit of IBM and as appliance-maker Haier attempted in its bid to acquire Whirlpool. Another such company in Dae's sights, Konka, is among the largest television manufacturers in the world and a supplier to Sharp, Toshiba and other brands, but remains unknown outside China. It is not lost on these firms that most of the end user value is not in the physical production of their goods but in design, marketing, advertising and branding. It is inevitable, Kwok believes, that those firms will be looking to go beyond a supplier role and raise their profiles globally.

Silicon Valley played an important part in the "rollup"—M&A expansion, to achieve industry scale—of Focus Media Holdings. Focus was begun in January 2003 by Jason Jiang, a 33-year old ad executive, who had noticed while waiting in a Shanghai office building for an elevator and staring at a print movie poster, that workers waiting for and riding in China's slow office building elevators are a captive audience and might like to watch more interesting video advertising.

Jiang arranged successful six-month trials to install 17-inch screens in 50 buildings in Shanghai, showing ads from Hennessy cognac, Fujifilm, China Netcom and others. He next raised an initial \$500,000 from Softbank China Venture Capital to set up offices and a company structure. That in turn attracted \$42.5 million in 2004 from additional venture investors, among them Draper Fisher Jurvetson. Focus shifted its attention to Beijing, Shenzhen and Guangzhou, and office and high-rise condominium buildings, supermarkets and airport shuttles serving affluent Chinese workers, residents and travelers. The list of advertisers grew to include Samsung, Nokia, General Motors Corp., Ford Motor Co., Motorola, HSBC, Haier, Unilever and MacDonald's. The number of screens grew to 35,000 in 52 cities by late 2005.

As Focus concentrated on Beijing and Southern China, Shanghai Framedia Advertising, an installer of framed poster advertising in residential buildings—the kind that first gave Jiang the idea for his company—approached Silicon Valley venture firm Hina Capital Partners about selling some assets. Seeing potential, Hina instead bought a one-third stake in Framedia in late 2004, bringing Hina general partner Dr. Zhi Tan—formerly head of M&A for the Tom Group—onto the Framedia board as chairman. Over the next eight months, Framedia acquired seven small, local and regional poster frame advertising companies in China that were each number one in their respective markets and were prepared for acquisition by a Hina team. Framedia's market share grew from 12–75% in China, and both revenues and net income grew five-fold by late 2005.

Focus raised \$172 million in a highly successful July 2005 listing on NASDAQ, and its shares rose 50% by yearend. In October 2005 Focus acquired Framedia for \$183 million in cash and stock. Hina served as Framedia's advisors. Focus quickly acquired its only remaining major rival firm, Target Media Holdings, for \$325 million in cash and stock. Just over three years after it was established, Focus has 1,800 advertisers, with 71,000 video screens and nearly 209,000 poster frames in 86 cities. While the company is entirely Chinese, its growth strategy, expansion by acquisition, management formation and preparation for listing all have their roots in the Bay Area.

Already, Focus has a Bay Area venture-funded competitor: W.R. Hambrecht + Co. has been an early stage investor in Epin Technologies Ltd., a company that uses wireless technology developed in China and the U.S. to create a multimedia screen network offering travel information, weather, news, entertainment and advertising on passenger and commute trains. Epin, started in 2002 by MIT graduate and CEO Feng Li, was installed on 105 express trains serving Beijing to and from Tianjin, Xi'an, Guilin, Wuhan and Guangzhou as of August 2006, and is expected to serve 200 by the end of 2006 and 500 by 2008.

Environment/Energy

Market Environment

Industrial growth and decades of poor resource management have left China with a range of environmental problems. Water resources in China are scarce given the country's immense population, and most are concentrated in the south or east. Factories and cities dump an estimated 40–60 billion tons of wastewater and sewage into China's lakes and rivers each year, 70% of which are considered seriously polluted. An estimated 600 million Chinese rely on daily water supplies contaminated to some degree by human and animal waste, and a 2004 study by consulting firm Frost & Sullivan found that China would have to spend \$48 billion on 10,000 more wastewater treatment plants just to reach a 50% treatment rate.

Coal-fired power plants provide nearly 70% of China's electricity and coal is commonly burned for home heating. As a result, China leads the world in sulphur dioxide emissions and acid rain. The environmental effects of Chinese emissions reach as far as California. According to the World Bank, 16 of the world's 20 most polluted cities are in China. The State Environmental

Ties That Bind

Protection Agency (SEPA) tested the air in 300 Chinese cities in 2002 and found that two-thirds failed World Health Organization air quality standards. By 2020 the government hopes to reduce the amount of energy produced by coal to 54%, with the remaining 46% coming from oil, natural gas, nuclear and renewable energy sources.

Massive deforestation and draining of marshes in China has eroded grass and agricultural land and led to rapid advancing of deserts, producing dust and sandstorms reaching Korea and Japan as well as cycles of drought and flash floods. Only 15% of China's land is arable, compared with 49% for India, and the Ministry of Land and Resources reports that as many as 22 million acres have been lost in the past 10 years, forcing China to increase agricultural imports.

With 22% of the world's population, China has only 8% of its renewable fresh water. Soil erosion dumps adds 5 billion tons annually to river and lake silt deposits. Dam construction along the Yellow River and in the Huai River Basin during the communist era have forced downstream cities and towns to build reservoirs and drill ever deeper wells draining underground aquifers in search of water. Land in the center of Shanghai has sunk more than 6 feet since the 1960s, as a result of deep drilling for potable water. The port city of Tianjin on the northeastern coast has all but drained some 300 tributaries feeding the Hai River on which it is located, with some 30 dams and reservoirs. Agricultural runoff, industrial dumping and urban waste have polluted the reservoirs to the extent that the city of 9 million now diverts water from the Yellow River.

Nearly half of the world's 45,000 large dams are located in China. The largest, Three Gorges Dam across the Chang River, began construction in 1994, with completion of the entire project scheduled for 2009. Building the \$25 billion project, which will generate over 18,000 megawatts of hydropower annually, required relocation of 1.3 million people for a 373-mile reservoir upstream. A massive North-South Water Transfer (NSWT) project is underway to redistribute Yangtze River Basin water to Northern China via a series of canals. The 722-mile, \$9 billion "Eastern Line," the least complex and expensive of the three, will deliver water to the Huang, Huai and Hai River Basins and to the Shandong Peninsula, including the cities of Beijing and Tianjin, by 2008.

Still, China is experiencing its worst drought in more than 50 years. That in turn is cutting output of hydroelectric power generation from Three Gorges and other projects. Hydropower plants and reservoirs in Chongqing municipality ceased all operations in late August 2006. Water shortages and high oil prices have in turn increased reliance on coal for energy production in recent months.

In July 2004 an 83-mile long flow of factory wastes on the Huai River killed fish and wildlife because so much water had been diverted from the Huai that it could not clean itself. In November 2005 a petrochemical plant explosion released 100 tons of benzene into the Songhua River in northeastern China, potentially affecting 3.8 million people. Since then more than 130 accidents contaminating China's water supply have been reported. An April 2006 spill from two paper mills buried part of the Inner Mongolian village of Sugai after residents tried to stop the spill with a makeshift dike.

Bay Area-China Trade: Behind the Numbers

These and nearly 50 other major environmental accidents and discharges reported by SEPA have prompted serious government attention. SEPA places the cost of environmental damage in China in 2004 at about \$64 billion, just over 3% of GDP; other estimates place the damage at as high as 10%. Pressure is coming from other quarters as well, among them:

- Local constituencies affected by pollution
- Urban, affluent Chinese with rising quality of life expectations
- Domestic and foreign NGOs
- International agencies setting environmental requirements to funding
- Neighboring governments complaining of dust, smog and acid rain
- Prestige concerns as the 2008 Olympics approaches

China is participating in a World Bank carbon trading system growing out of the Kyoto protocol to reduce greenhouse gas emissions worldwide. Long underfunded, SEPA's resources have been increased, including 11 new regional offices to strengthen local pollution monitoring and enforcement efforts. \$175 billion has been committed to environmental cleanup during 2006–2010 for industrial wastewater treatment, improved air quality in 113 cities, 31 provincial level dangerous waste disposal centers, sewage treatment plants in 10 river valleys, and other projects. In February 2006 SEPA announced a "Green GDP" pilot program in 10 regions, to measure performance of local leaders in meeting environmental goals, and to assign a political cost to reckless development for its own sake that has been common at the local and provincial levels. China is also studying \$24 billion worth of proposed projects for coal-to-liquids (CTL) and coal gasification to ease pollution. And with the PRC's auto market expected to grow from 20 vehicles per 1,000 people today to 267 per 1,000 in 2030, carmakers and environmentalists see China potentially providing the critical mass of customers that will enable conversion from the combustible engine to hydrogen fuel cells worldwide.

Bay Area Connections

Foreign company activity in China's environmental and energy sectors is still in the infant stages. Nevertheless, competition is heating up. As mentioned earlier, Bay Area architects and planners are deeply involved in the design of environmentally-sensitive buildings, planned communities and urban landscaping to address traffic, water quality, energy, open space and livability issues facing Chinese cities. Northern California venture firms participated in the growth of China's largest alternative energy company, **Suntech Power**, and are showing increased interest in environmental companies as they diversify their holdings. State officials say California is home to as many as 100 firms specializing in energy efficiency technology, but market entry in China for small and mid-sized business is a steep climb, given that the customer base is still largely the government.

Most of the Bay Area-China linkages, are still in the government, academic and NGO areas. During a two-week China visit in September 2005, for example, representatives of the **California Public Utilities Commission, California Energy Commission** and **Pacific Gas & Electric Co.** signed cooperation agreements with Jiangsu Province, Shanghai Province and the central

government in Beijing to provide consulting and training to Chinese regulator agencies and utilities. Specifically, the Chinese side is interested in demand side management (DSM) pricing, fees, efficiency standards, subsidies and other strategies used by regulators and power generators to limit energy consumption. The Natural Resources Defense Council, which helped organize the trip, estimates that China could cut energy consumption by 10% in the next decade through DSM, eliminating the need for 26 coal-fired plants.

The **Energy Foundation**, a San Francisco-based partnership of major donors such as the William and Flora Hewlett Foundation, the John D. and Catherine T. MacArthur Foundation, the David and Lucille Packard Foundation and the Pew Charitable Trusts, also participated in planning the State visit to China. The Foundation's principal effort is the China Sustainable Energy Program (CSEP), launched in 1999 and focusing on six key areas:

- Low-carbon development paths
- Transportation
- Buildings
- Industry
- Electric utilities
- Renewable energy

CSEP is providing support for Chinese energy analysts in developing models and scenarios through 2020 for reducing energy demand and carbon emissions and increasing use of renewable energy sources. It is assisting in the design and development of advanced vehicle technologies (hybrid-electric, zero emissions, etc.) for the China market, while consulting with policymakers on fuel economy and emissions standards. Grantees have helped develop standards for fluorescent lamps, clothes washers and televisions that could eliminate the need for 10 500-megawatt coal-fired utility plants by 2010.

CSEP is also working with the government on cogeneration and other energy efficiency policies to implement the 1997 Energy Conservation Law aimed at China's 7,200 largest energy-intensive industrial enterprises, particularly in the iron and steel sector. Finally the program has funded initiatives to develop performance standards to regulate power plant emissions, and to establish mandatory market share (MMS) targets and financing incentives for independent power producers offering renewable energy technologies.

Lawrence Berkeley National Laboratory has a **China Energy Group (CEG)** that began exchanges and collaborative projects with Chinese energy researchers in 1989. The group collaborated with the Energy Foundation and the U.S. Department of Energy on a May 2005 report, "Evaluation of China's Energy Strategy Options," in part assessing the Chinese government's National Energy Strategy. CEG has developed a pilot program of voluntary energy efficiency agreements (VAs) for two iron and steel plants in Shandong Province, under which the plants agree to meet efficiency targets and the province provides technical assistance, financing support and public recognition. The program was later expanded nationwide. Similar efficiency programs were implemented in the chemical, cement, brick, metal casting and coking industries; a separate program covered 15 enterprises in the city of Qingdao.

Other CEG projects have focused on reducing use of coal and biomass in home heating stoves, in cooperation with UC Berkeley, UC San Francisco, Tsinghua University, Renmin University and the Chinese Centers for Disease Control; development of building codes for energy savings in the cities of Guangzhou and Shanghai aimed at a 35–50% energy savings at less than a 10% cost increase; installation of renewable energy projects in China, in cooperation with the National Renewable Energy Laboratory and Chinese partners; training of 145 Chinese personnel in Berkeley and in China over a 9-year period from 1993–2002; and establishment of a private energy consulting and marketing services group in China, the Beijing Energy Efficiency Center (BECon).

The **U.S. Environmental Protection Agency** signed a memorandum of understanding with SEPA in 2003, establishing a working group to implement a Strategy for Clean Air and Energy Cooperation in four principal sectors: regional air quality, transportation, power and cement. EPA's China group is based in San Francisco.

EPA and SEPA have helped the Shanghai Environmental Protection Bureau develop an air quality management program, including standards, monitoring, regulations, enforcement, training and public education. They are also assisting Beijing with bus engine retrofits, clean fuels, methane capture from landfills, energy-efficient building designs and other measures, in preparation for the 2008 Olympics. EPA is advising SEPA on pollution control technologies for utility and cement plants, and mechanisms to encourage and fund companies to retrofit boilers and kilns. A joint EPA/Department of Energy Wind Technology Partnership is working on development and utilization of grid-connected wind power in China.

Formed in 1987 as the Pacific Energy and Resources Center, **Pacific Environment** initially focused its environmental efforts in the Russian Far East and Central Asia. It has become active in China in recent years through the Global Greengrants Fund, providing small grants to some 50 grassroots NGOs throughout China. NGOs were permitted to officially operate in China beginning in 1994, and some 2,000 environmental NGOs are active today.

Groups supported by Pacific Environment are largely community-based networks of activists working on issues such as desertification in Xinjiang Province; Huai, Singhua and Han River pollution; endangered species protection in Wenzhou, Zhejiang Province; conservation/recycling in Zhejiang Province; and coastal environment and wetlands preservation in Xiamen and in Fujian Province.; and opposition to dam construction on the Nu River. It maintains a Beijing office headed by Chinese environmental activist Wen Bo.

Chevron's China Energy Play

Chevron has operated in China since 1979. It is a partner in the CACT Operators Group, which also includes China National Offshore Oil Corp. CACT started production from the Huizhou fields in 1990 and is China's major offshore foreign operator, pumping some 50,000 barrels per day (bpd).

Chevron also produces 58,000 bpd from the BZ 25-1 and QHD 32-6 oil fields in Bohai Bay and, along with its partner in NWS Australia, is the supplier to China's first LNG project in Guangdong province.

Under the Caltex brand name, Chevron operates 43 service stations in Guangdong Province and 49 stations plus a fuels terminal in Hong Kong SAR. It operates two lubricants blending plants, and markets a broad range of lubricants through an extensive network covering major cities in China. Caltex operates a 12,000-ton capacity asphalt terminal in Shandong Province, and in 2000 completed construction of a 100,000 metric-ton capacity import and storage LPG facility.

Chevron completed a 100,000 metric-ton annual capacity polystyrene plant in Zhangjiagang City, Jiangsu Province in 2000 for the manufacture of plastics. ChevronPhillips has a 40% stake in a Shanghai joint venture with Shanghai Petrochemical Corp. that manufactures and markets high-density polyethylene (HDPE).

Chevron is invested in the development of the local Chinese work force, and has extended learning and development programs to its joint venture partners. New employees entering CACT are provided with hands-on management, operations and safety training. More than 90% of all positions in Chevron's China upstream operations, including all joint venture employees, are held by Chinese nationals; and 99% of all downstream employees are local nationals.



4

Investment: Building Global Businesses in a New China

China's technological capacity is growing, and while it is not currently a source of innovation comparable to the United States, this may change with time. Taiwan has established itself as a major center for semiconductor manufacturing and, like the PRC, for applied research. While Taiwan's ability to innovate has been hampered by its lack of a large domestic market, the size of the mainland market suggests that by mobilizing its base of entrepreneurs, and by either importing or leapfrogging foreign technology, it will eventually develop a capacity for advanced innovation and a more sophisticated production capacity. Many examples of China's incremental approach to accessing global technology, business processes and management practices through foreign investment are documented throughout this report.

Market Environment

China's market opening began in earnest in the 1990s, with sector-specific easing of rules to allow foreign representative offices, then minority joint ventures, next followed by increases in permitted equity stakes to majority or controlling interest, and finally full foreign ownership of licensed businesses.

At the same time, the central government has sought to wean thousands of non-strategic state-owned enterprises (SOEs)—which still account for some 30% of China's manufacturing output—from state control and support. Since 2003, it has fully or partially restructured more than 85% of SOEs listed on the Shenzhen and Shanghai stock exchanges; opened state-owned and domestically-traded "A" shares in those companies to "qualified foreign investment institutions" (QFIIs) meeting a minimum asset threshold; encouraged "qualified domestic investment institutions" (QDIIs) to invest overseas; allowed a broader range of "foreign invested enterprises" (FIEs) beyond traditional minority joint ventures; and eased mergers and acquisitions (M&A) rules to encourage foreign acquisition of, and participation in, Chinese companies.

Chinese government estimates of foreign direct investment (FDI) in 2005 were revised upward in June 2006 to \$72.4 billion, to include government approvals of 18 foreign-invested banks, insurance and securities firms, and fund management operations. This followed FDI growth of \$60.6 billion in 2004 and \$53.5 billion in 2003.

Startups and Turnarounds on a Grand Scale

In the period since China joined the WTO, U.S. companies have been aggressively increasing their market share through mergers and acquisitions across a range of sectors. Investment is flowing to China through both private equity (large cap) and venture capital (small cap).

The opportunities presented by State Owned Enterprises (SOEs) are complex. The distressed condition and opaque accounting practices of many SOEs, the complex multi-agency review and public auction processes for state-owned and legal person shares, and the inability to exit through a foreign IPO, has limited enthusiasm for transactions. As an investment banker put it, “due diligence can be like peeling an onion—the more you peel, the more you cry.” Still, SOEs represent an opportunity for leveraged buyout specialists to pick up and restructure distressed assets at favorable prices, de-list and turn them around, and partner with investment banks to match them with foreign partners.

For most investors, the preferred method of foreign ownership is through offshore holding companies in Hong Kong, the Cayman Islands, British Virgin Islands, or other favorable locations. Such offshore entities may be opened and closed, bought and sold, merged or restructured with little or no Chinese government intervention. While a NASDAQ or New York Stock Exchange listing may have cache, listings have gravitated toward the Hong Kong Exchanges more recently—Bank of China is a case in point—to avoid Sarbanes-Oxley and other strict U.S. corporate governance regulations perceived as unduly burdensome.

Investment transactions in China today may have any of several objectives:

- Rapid entry, presence and brand identity in the China market through M&A
- Vertical integration to achieve scale, synergies and global reach
- Restructure or rollup of companies to prepare for acquisition or IPO

Whether the source is an equity partnership or a venture capital (VC) fund, the strategies are similar: Build an experienced, credible management team; clean up the balance sheet; implement global finance and accounting practices; streamline operations; and strengthen the core business through M&A and vertical integration as needed.

Growing investment opportunity is reflected in increased interest in China by venture capital. A survey of 505 venture capitalists worldwide, conducted by Deloitte and the National Venture Capital Association during the second quarter of 2006, identified China and India as the top two foreign countries where U.S. venture firms plan to put their money in the next five years. Both countries are viewed as places where 1) it is less expensive to build businesses; 2) there is an emerging entrepreneurial culture, and 3) there is a high quality deal flow. While India scored highest in terms of access to quality entrepreneurs, China was the leader in terms of access to foreign markets. China’s three main impediments to investing for U.S. venture capitalists surveyed were intellectual property concerns, travel time and effort, and lack of knowledge/expertise in the business environment. Another is the absence of a liquid IPO market in China, which leads VC-funded enterprises to go public on the NASDAQ, in Hong Kong or on other foreign exchanges.

Investment: Building Global Businesses in a New China

This interest in investing abroad by U.S. venture capital firms represents a sea change for an industry that has historically invested all of its money domestically.

Investors see particular upside potential in the fact that many of China's traditional industry sectors are highly decentralized with no distinct industry leader. For example, Shanghai Baosteel Group, a conglomerate formed in 1998 from 11 iron and steel companies, is the world's 6th largest steel producer, yet it holds only a 7% market share among China's 134 steel companies. This is in part the result of Maoist Cold War security policy to disperse steel production throughout the country in case of attack. Poor highway and transportation infrastructure, balkanized regional and local political interests, and local preferences have contributed to a similar fragmentation of China's consumer market, leading to regional markets and products without national reach. This can also pose challenges for foreign investors seeking to operate at a national scale.

Still, the scale and growth of China's market is stimulating deal flows, reflected in growing M&A activity. Draft rules issued for comment in May 2006 by the China Securities Regulatory Commission, which oversees the Shanghai and Shenzhen stock exchanges, propose to reinstate IPOs for listed companies, allowing them to convert their non-tradable shares so they can use their own equity for mergers and acquisitions. As of late September 2006, 1,169 of the 1,343 listed companies on the two exchanges had started or completed plans to make their previously non-tradable shares publicly tradable. These plans have typically involved combining various classes of non-tradable and restricted shares, along with government-guaranteed issues to compensate existing domestic shareholders for potential dilution of their interests, into a single, tradable class of stock known as "G" shares.

So far, the combining of share classes has eroded G share values. Listed companies have tended to trade at very high multiples at the time of an IPO and then decline in value as earnings and fundamentals becomes more apparent. Internal management and accounting reforms and reporting transparency are proceeding, but slowly. Add in exchange rate concerns, and investor reticence continues to limit trading on the Shanghai and Shenzhen exchanges. A successful ICBC listing on the Hong Kong and Shanghai exchanges, however, is expected to provide a jump start for new Chinese listings.

It should be noted that, despite its market economy elements, much of what happens in China is still administratively determined by the government, introducing a factor of political as well as commercial risk for foreign investors. Less than a year after issuing clarified rules encouraging private equity and venture capital investment to go forward, Chinese regulators have imposed new measures to re-exert partial control. In the telecommunications/internet sector, where direct foreign ownership is tightly restricted, the Ministry of Information Industry (MII) adopted rules in July 2006 to more closely regulate contractual relationships between foreign-owned off-shore entities known as special purpose vehicles (SPVs) which hold specific technology, trademarks and domain names, and the "Restricted Companies" that actually provide those services under Chinese telecom licenses. In September 2006 the Ministry of Commerce and three agencies overseeing state-controlled assets and securities transactions adopted tighter controls on share swaps where a foreign entity acquires a domestic company for eventual overseas

Ties That Bind

IPO—particularly in cases involving acquisitions of well-known Chinese trademarks or brands. To some degree these actions appear to have been stimulated by the recent surge in foreign merger and acquisition activity. The new moves suggest growing nationalism on the government's part, and a readiness to intervene to protect local companies, support the development of national brands, and limit the market power and influence of foreign companies.

Bay Area Connections

The above factors taken together suggest a continued advantage for Bay Area investors already established in the China market. While venture capital and private equity account for only a small part of the \$50–70 billion in foreign investment being poured into China each year (the greater part being investment in new facilities), they are playing a particularly important role in China's growing entrepreneurial community and in technology and internet plays in particular.

In newer service and tech sectors, particularly wireless communications and the internet, Chinese companies—and Bay Area startups formed by Chinese science, engineering and business school graduates—bring to the table distinct technology solutions geared to the Chinese market.

Converting Entrepreneurs to Managers

The challenge up to now, fund managers agree, has been developing the management capability to run a hybrid global enterprise that blends Silicon Valley freedom and innovation, Chinese cost savings and discipline, and global business sophistication.

Min Zhu, a Stanford doctoral graduate and founder of web conferencing, presentations and training firm WebEx, is now a manager of the **New Enterprise Associates (NEA)** \$100 million **Northern Light** incubator fund and an officer of the Hua Yuan Science and Technology Association's Beijing Chapter. Northern Light plans to spend an average of \$10 million each on 10 startups in China and California—in sectors ranging from internet-based insurance to radiology/oncology scanning devices to solar panels. But the focus will be as much on building management capability as with bringing new technology to market. Zhu says China affords entrepreneurs and investors an opportunity to re-create successful Western enterprise and industry models from the ground up, at a fraction of the cost, leaving room for experimentation and error.

Acorn Campus Ventures, a startup incubator launched by mainland and Taiwanese engineers, provides venture funding and mentorship plus office space and shared research facilities in Cupertino and Shanghai. Acorn looks for proposals involving “paradigm shift and disruptive technologies” with strong growth potential, high entry barriers and viable intellectual property, but also a strong team and solid core competencies. Its focus is in communications, wireless, semiconductor, photonics, internet and life sciences.

Management in China can be a balancing act. Investment banker Ken Tsang, co-founder and managing director at **Hina Group**, says culture is the biggest issue in an M&A transaction, or in restructuring a company for a stock exchange listing. Chinese managers and workers are often

initially distrustful of a Western-educated management team, and fear losing their jobs. Building trust requires bilingual skills, consultation and cultural sensitivity to make integration work. Zhu, who grew up on a collective farm during the Cultural Revolution before passing an exam and going on to college, notes too that highly-trained Chinese engineers, unlike their Western counterparts, see themselves as blue-collar workers and are uncomfortable with the less structured workplace familiarity of Silicon Valley.

Cross-Border Synergies

Qualified, bicultural managers—science, engineering and business entrepreneurs, known as “astronauts” because of time spent in the air, and “sea turtles” in the case of U.S.-educated China nationals who return home—are in high demand, shuttling between the Bay Area and greater China to build and run companies. Those companies are in turn being listed and/or rolled up into larger companies, creating wealth for founders and investors, and jobs on both sides of the Pacific.

Two examples: Hina Group advised **NeoPhotonics**, a San Jose optical component maker with 80 employees, in the acquisition of ShenZhen Photon Technology Co., a Chinese maker of laser diodes for telecommunications equipment with 1,200 employees. The deal combined complementary technologies, adding value to ShenZhen Photon’s product line while increasing NeoPhotonics’ revenue stream. It kept NeoPhotonics’ fabrication plant in San Jose open, and provided ShenZhen Photon with stronger management and a U.S. sales network. In its first year, the newly-merged NeoPhotonics doubled revenues and added Bay Area sales and production jobs. In June 2006 it acquired two Bay Area companies, Newark-based **LightConnect Inc.** and **Optun Inc.** of Santa Clara, which strengthen NeoPhotonics’ product line of modules and components for managing broadband traffic along fiberoptic networks. In conjunction with these acquisitions, the firm completed a new \$50 million equity financing.

Cross-border investment advisors George Sycip and Richard Chong, through their San Francisco-based partnership **Galaxaco China Group LLC**, matched **MBA Polymers** of Richmond with state-owned Guangzhou Iron and Steel Enterprises (GISE) in a \$12 million plastics recycling joint venture. The plant opened in November 2005 and expects to earn \$15 million in revenues in its first year.

MBA Polymers, launched in Berkeley in 1994, has developed a 30-step process for separating out the high-end plastic content from appliances, computers, office machines and consumer electronics. The process is unique in that it can isolate complex polypropylene, high-impact polystyrene and other compounds in commercial-scale quantities—3 tons per hour at Richmond—for reuse. The company has raised nearly \$30 million over the years from angel and venture investors, the U.S. government and two large customers, GE Plastics and Flextronics International.

MBA Polymers CEO and co-founder Dr. Michael Biddle sees the greatest potential demand growth for recycled plastics being overseas. China, in particular, is the world’s fastest-growing market for new and recycled plastics, and imports 50% of the plastics it uses in manufacturing. Its government is working on environmental laws mandating high-end plastics collection and

recycling, which will dramatically increase the recycling stream and demand. Similar laws have been passed in Taiwan, South Korea and Japan, and recycling capacity remains tight because of the complexity in separating plastics from other materials, and different plastics grades and colors, in products with sophisticated electronics components.

The U.S. has no such regulations, meaning that a lot of recyclable plastic ends up in dumps and landfills. A lack of steady raw material supplies has limited expansion potential for the Richmond plant, Biddle says. The Guangzhou plant—55% owned by MBA Polymers and 45% owned by GISE—has double the capacity of Richmond, and 100 workers versus Richmond's 22. Low labor costs, government incentives in the development zone and modern equipment will help MBA Polymers produce its recycled plastics for a low \$200–300 per ton, increasing its margins. State-owned GISE's government connections helped smooth permits and approvals. Prospective customers Toyota, Honda and BASF, as well as GE Plastics, have operations in or near Nansha Development Zone.

The China joint venture, and a similar one in Austria, have improved the viability of MBA Polymer's overall operations. Biddle says the company intends to maintain Richmond as a headquarters, R&D center, demonstration center and production facility. It has hired additional engineers there and has made additional capital investment to modernize and increase output.

Another company Galaxaco has taken to China is Silicon Valley-based **Arasor**. Led by overseas Chinese who are now U.S. citizens, Arasor is developing broadband wireless architecture for the 2008 Beijing Olympics that will enable visitors at one event to watch multiple events simultaneously through their personal digital assistants (PDAs). Arasor's R&D is done in both Silicon Valley and China.

A China Strategy Helps a Small Manufacturer Survive

SKS Die Casting, in Alameda, grew with the computer industry. As the economy stumbled and more components were outsourced overseas, however, profits dropped by half and its employees by almost two-thirds. Silk Road Enterprises (SRE), a company founded by then-San Francisco State University President Cai Wei Woo to facilitate tech transfer to the computer industry in China, introduced several teams of Chinese engineers to SKS, which led in 1984 to a joint venture between SKS and SRE called Pacific Die Casting and Machining to explore a joint venture in China. This led in 1987 to an invitation from China's Ministry of Science and technology and the China National Electronics Import and Export Corporation to submit a proposal to build a modern die casting and machinery facility in China.



Since then three joint venture plants have opened: in Zhuhai (Guangdong Province), Qinhuangdao (Hebei Province) and Chongqing. State of the art equipment has been installed and engineers were brought to the U.S. for further training. SKS management believes that this strategy has allowed the company to stay in business, in the face of rising costs and intensifying competition.

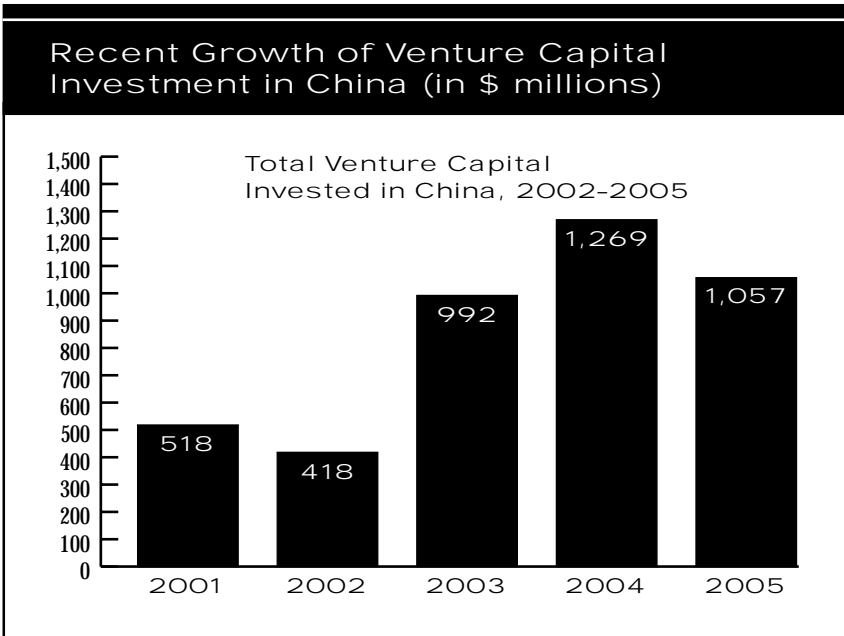
Today prototype development and early stage and small scale production is done in Alameda; higher volume production is done in China. Even as its China operations have grown, SKS maintains a significant workforce in the Bay Area and in recent years has added employees.

Venture Funding Accelerates

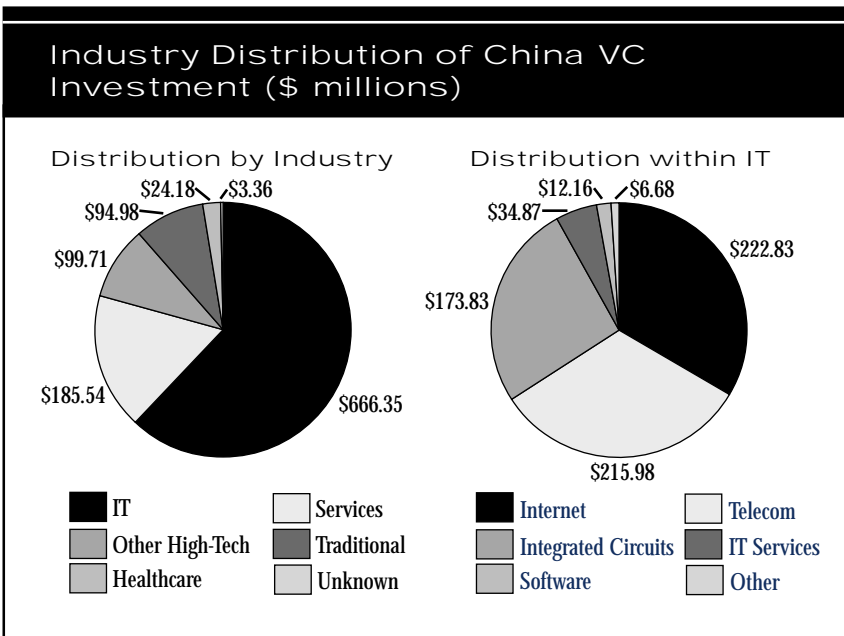
For the future, China's attraction for venture capital is the deep base of assets—research, education, entrepreneurial, manufacturing and market size—that gives it the potential to produce competitive companies of global scale. One factor that limits China's attractiveness is the inability of companies capitalized with foreign investment to pursue IPOs on the domestic stock markets (Shenzen and Shanghai). This leads foreign VCs to invest in companies with foreign domiciles, positioning them for possible listing on the Hong Kong, NASDAQ or other foreign exchanges.

Zero2IPO, a Chinese venture capital research firm based in Beijing, estimates in its latest annual report that nearly \$1.06 billion in foreign venture capital was invested in 233 mainland and mainland-related enterprises in 2005, most of those in Shanghai. More than 60% of that investment was in the IT sector, and another 20% was in internet-related businesses. In 2005 VC funds supported 17 IPOs and 12 M&A deals; between 30% and 40% of the \$1.06 billion total is believed to have originated with Silicon Valley venture funds. Last year's investment represents a tapering off from the \$1.27 billion in VC investment in 253 companies for 2004. A third of total investment was in the integrated circuit sector—including \$353 million to some 30 fabless (using outsourced fabrication) design companies. Accordingly, most of the investment recipients were in and around Beijing universities and technology parks. Total VC investment in China since 2001 has totaled more than \$4.2 billion.

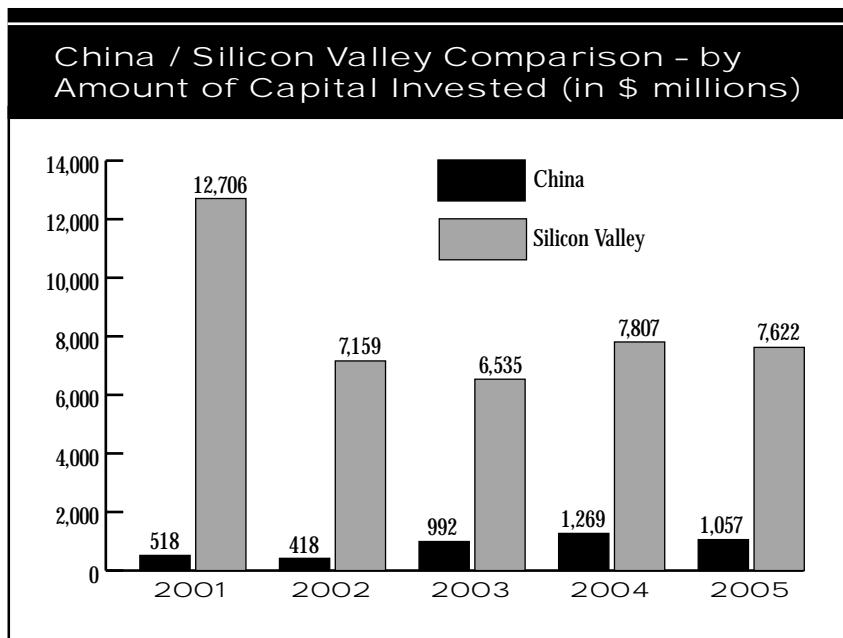
Ties That Bind



Source:
Zero2IPO
Research Center



Source:
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Research Center



*Source:
Zero2IPO
Research Center*

Despite the slight falloff in venture investment last year, Zero2IPO reports that mainland and foreign VC firms had raised a total \$4 billion in new China-related funds. VC firms interviewed for this report agreed that, after numerous successful exits in 2004–05 (70% through IPOs, including Semiconductor Manufacturing International Corp. (SMIC), Shanda, Linktone, 51job, Ctrip, Baidu, solar power firm Suntech, Focus Media and Alibaba), the latest round of China funds are significantly larger.

Leading Bay Area Venture Capital, Private Equity and Investment Banking Firms Active in Greater China

- Accel Partners
- Acorn Campus
- Burrill & Co.
- ChinaVest
- DCM-Doll Capital Management
- Draper Fisher Jurvetson (ePlanet Ventures)
- Galaxaco China Group LLC
- GSR Ventures
- Granite Ventures LLC
- Hina Group
- IBM Venture Capital Group
- IDG Venture Capital
- Intel Capital China Technology Fund
- Kenson Ventures

Mayfield Fund
Mirador Capital
New Enterprise Associates (Northern Light)
Sequoia Capital
W.I. Harper Group
W.R. Hambrecht Ventures
Walden International
Woodside Fund

IBM Venture Capital Group, based in Menlo Park, began moving aggressively into China in 2004, focusing initially on the emerging semiconductor and hardware sectors, but more recently on software as well. More than 100 deals have been closed in the past two years. IBM's strategy focuses on investing in companies that complement its own objectives, in effect making its venture arm a business development vehicle. Intel, which has invested in some 50 mainland and Hong Kong companies since 1998, launched a \$200 million **Intel Capital China Technology Fund** in 2005. **Sequoia Capital**, which previously restricted its activities to Silicon Valley, also announced establishment of a \$200 million China fund last year. The China venture arm of San Francisco-based life sciences firm Burrill & Company, **Burrill Greater China Group (BGCG)**, plans to raise \$50–100 million in its current funding round. **Accel Partners** of Palo Alto and **IDG Venture Capital** of San Francisco launched a China growth fund in September 2005 and closed it three months later with \$290 million from institutional investors. The fund will invest in IT, health care and consumer technology startups, as well as emerging technologies. **W.I Harper**, begun in 1993 as an advisory services arm of **Walden International**, has been active in mainland China as an independent entity since 1996 and Harper chairman Peter Liu's history in greater China dates back to 1983, primarily through tech investments in Taiwan. Harper has completed five funds totaling \$250 million. A sixth fund, targeted to raise \$150 million, is for the first time open to institutional fund investment.

In May 2006, **Sequoia Capital**, **DCM-Doll Capital Management** and Legend Capital closed a \$30 million Series B venture financing of Worksoft Creative Software Technology Ltd., the largest Chinese IT outsourcing provider to the U.S. and Europe, with a client list including IBM, Oracle, Microsoft, Hewlett-Packard, General Electric and Sony. The investment is Sequoia's first through its newly-created China fund.

A partnership of Texas Pacific Group and Blum Capital Partners, **Newbridge Capital** was one of the first private equity firms dedicated to investing in Asia. It raised its first fund in 1994, primarily to make investments in Greater China. Today it has offices in San Francisco, Hong Kong and Shanghai, in addition to Australia, India, Singapore and Tokyo. Newbridge's more prominent investments include its \$150 million stake in Shenzhen Development Bank, an early investment in computer maker Lenovo, and a planned \$150–200 million investment in a Xinjiang Guanghui Industry Co. onshore liquefied natural gas project in Guanghui. The project will liquefy gas from PetroChina's Turpan-Hami oilfield in Xinjiang.

ChinaVest's initial funds were in the \$25 million range, growing during the 1990s to the \$100 million level for two funds in 1993 and 1998. Currently, according to Senior Vice President Michael Brownrigg, \$100–150 million is the logical scale for new China funds. ChinaVest began operating in China in 1983 as a venture fund. Since then it has invested in more than 60 companies, and has expanded over the years to offer independent research and financial advisory services. In 2004 it opened a merchant bank to broaden its capabilities. Today ChinaVest funds enterprises valued at \$25–400 million in several specific sectors: logistics and distribution, value-added manufacturing, information technology/media and, more recently, biotechnology. Two-thirds of its investments are in greater China, and the remaining third is with U.S. companies operating in China.

Former HP executive Lee Ting, now managing director of **W.R. Hambrecht + Co.** says his firm has a China venture strategy that focuses on “application of technology in disruptive business models that provide high-value services to underserved mass consumer markets.”

Bay Area venture capital firms are playing a distinct role in China through their support for entrepreneurial activity and the creation of new companies with high growth potential, particularly in the IT and internet sectors. Still, it's not a business for the timid. Brownrigg is skeptical of venture investment and the recent round of M&A rollups, noting that the short-term returns have been great but few of the companies have proven to be long-term successes. Several VC fund managers have voiced concern that too much money may now be chasing the “China miracle.” Investments by newcomer funds continue to focus in the already saturated Beijing, Shanghai and Shenzhen markets and in oversubscribed tech segments—even startup websites and blogs—suggesting the possibility of a tech bubble developing in China. This has pushed established funds to diversify their holdings and to pursue companies and deals in less traveled parts of the country.

Biotech and Healthcare Look Offshore

Biotech research in China began with establishment of the National Center for Biotechnology Development in 1983 and, a short time later, the “863 Program” to fund various science initiatives, among them biotech. The first pharmaceutical patents were granted in 1993.

Today, China's biotech sector includes more than 300 companies that conduct research and offer products and services. Most manufacture low-end laboratory equipment, chemical reagents, generic pharmaceuticals, vitamins, and remedies based on traditional Chinese medicine. But an estimated \$600 million annually in central government R&D funding, plus project support from local and provincial governments and growing foreign investment, have transformed the industry and accelerated growth over the past eight years. The government has targeted biotech as a priority area development in the next 15 years. New companies have moved into more advanced areas such as gene therapy, antibodies, genetically modified foods and traditional Chinese medicine (TCM) modernization.

Other forces have converged on the demand side to grow China's per capita annual health care spending by 20% and drug sales by 28%—four times the worldwide average:

- A strong economy
- Government health care reform initiatives
- An expanding private insurance market that encourages new medicines and technologies
- An aging population
- Pandemic scares such as SARS and avian flu
- Dietary and social changes leading to AIDS, diabetes, heart disease and other illnesses.

Taiwan and the PRC have aggressively targeted life sciences investment with government incentives, including research grants and loans; tax credits for R&D, new facilities, equipment and training; import and business tax exemptions; and development of life sciences technology clusters. But questions over intellectual property protection and ability to meet global compliance standards for drug development continue to shape and constrain foreign investment.

A number of fund managers contacted for this report indicated that biotech would likely feature prominently in new funding rounds, in part because of the opportunities outlined above and in part because the semiconductor, IT and internet sectors are beginning to look oversubscribed. Dr. Jonathan Wang, greater China general manager at Burrill & Co., sees opportunity in active pharmaceutical ingredients; gene therapy; and production of testing compounds. But the most promising area so far for foreign investors has been preclinical research. Wang notes that China is developing quickly as a center for innovation, based on scientists trained in the Bay Area and elsewhere in the U.S. who have returned to China, often maintaining research facilities in both countries. Looking at the China market, he sees health care spending growing 15–20% per year, and pharmaceutical sales growing much faster than the global average—28% vs. 7%.

Cost Control for Drug Research

The opportunity for cost control in drug research is another factor playing to China's advantage. Preclinical drug development costs in Taiwan and the PRC are 40% and 25%, respectively, of comparable costs in the U.S. Companies can draw from a nationwide talent pool of some 200,000 research scientists with strong, though perhaps not cutting-edge, skills. China has large numbers of "naïve" patients with no previous exposure to any drugs, who are particularly valuable in human trials. Animal and stem cell research do not face the same obstacles as in the U.S. and the quality of data coming from pre-clinical and clinical trials is high. These factors are important for pharmaceutical and biotech companies where the time from discovery to market can take as long as five years, stretching the funding from investors. In these conditions time is money, and shifting trials to China has proven an effective way to save both.

Epitomics Inc. of Burlingame produces monoclonal antibodies for medical research, diagnostics and therapeutics, with a unique technology using rabbits instead of rats. In 2004 the company rented and built out a 20,000-square foot laboratory outside Shanghai, with clean rooms, in only six weeks rather than the approximately nine months it took Epitomics to set up in Silicon

Investment: Building Global Businesses in a New China

Valley. The firm hired 50 researchers at about \$7,000 a year each and received from the government a two-year business tax holiday, exemption from taxes on imported equipment and inputs, and a grant covering 10% of first-year operating expenses. Together these benefits cut Epitomics' research costs in half, compared with its Burlingame operation.

In November 2005, Sen. Dianne Feinstein (D-CA) and San Francisco Mayor Gavin Newsom took part in a Beijing ribbon-cutting ceremony for **Bridge Pharmaceuticals'** 100,000-square foot preclinical development lab, in the Zhongguancun Life Sciences Park. Menlo Park-based Bridge, a contract research organization (CRO) spun off from SRI International in 2004, conducts outsourced pharmacology, toxicology and other animal-based research for biotech and pharmaceutical companies. The Beijing facility is the first of its kind in China, certified by the international Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) and designed to be fully compliant with U.S.-level OECD principles for good laboratory practice (GLP).

Bridge has incorporated 1,200 SRI standard operating procedures (SOPs) and quality assurance audits into its China program; all employees are trained in U.S.-level QA and SOPs are in English. Data encryption and security procedures protect intellectual property. Animals come exclusively from the only two U.S.-franchised animal breeders in China. An equity partner lab in Taiwan, and the company's BridgeNet network of 2,500 pre-screened chemical and manufacturing suppliers, give Bridge regional coverage in Asia for providing research to Western clients that is in full U.S. and EU regulatory compliance.

The scale of operation and the relative labor costs—\$30,000 a year for a post-doctoral chemist in China versus \$250–300,000 a year in the U.S., and less than \$10,000 a year for a Chinese researcher—dramatically improve preclinical lead times and cost. Bridge raised \$3.5 million in an initial round of venture funding, and in June 2006 closed \$22 million in Series B funding from new and returning venture and equity investors, among them Burrill. Significantly, says Wang, the China expansion has provided Bridge with the scale, cost savings and subsequent investment to maintain and add staff in Menlo Park.

Burrill, which has a venture firm and a merchant bank, specializes in the biotech and life sciences sector. It has advised **Chiron** in identifying Chinese partners, assisted Procter & Gamble Pharmaceuticals in a \$100 million China technology licensing deal, provided China strategic research to Roche Diagnostics, and participated in Invitrogen Corp.'s acquisition of BioAsia Co. Other investments include Shenzhen SiBiono Gene Tech, whose gene therapy product Gendicine treats head and neck tumors; and Shanghai-based chemistry research services firm Wuxi PharmaTech.

In the absence of a strong social safety net in China and only 3% of GNP spent on health care services—versus 14% in the U.S.—modern medical facilities are in short supply. At the same time, demand for upscale medical care is steadily rising with the number of affluent Chinese citizens and growing expatriate communities.

American Pacific Medical Group, founded by 35 U.S. physicians and surgeons in 1992, develops and operates inpatient medical facilities, high-tech hospitals and treatment centers

throughout China. APMG owns 10 joint ventures in Beijing, Shanghai, Shenyang, Harbin, Chongqing and Dalian. Some are VIP inpatient units within existing hospitals, while others are freestanding clinics. APMG's primary specializations are neurosurgery and radiation oncology, treating tumors and cancers with high-end "gamma knife" technologies, but an important component of their facilities is also maintenance and management that meet Western standards.

Among APMG's Chinese partners are Shanghai Medical University; Beijing Neurological Institute; First Affiliated Hospital of Tsinghua University; Shanghai Huashan Hospital of Fudan University, Chongwen District Public Health Bureau of Beijing, Chinese Medical University's Second Affiliated Hospital; and Harbin Medical University's First Affiliated Hospital. Venture capital firms ChinaVest and Ajia Partners of Hong Kong have provided financing for the enterprise.

China Grows Its Semiconductor Sector

An earlier section of this report described the flow of Taiwanese engineering and science students to the U.S. during the 1970s, and the Taiwan government's strategy to lure them back with venture and startup funding. In the process, Taiwanese engineers in Silicon Valley helped pioneer a new, more efficient and economic "fabless/foundry" business model for integrated circuit design and development.

Chips have become ever smaller, faster, more complex, more specialized and more densely packed together on larger, 300-millimeter wafers to perform specific tasks. As they have, the cost of materials, fabrication and testing have all increased commensurately. An integrated device manufacturer (IDM) like Intel, Advanced Micro Devices or Texas Instruments, that makes its own chip designs may spend more than \$3 billion to build a fabrication plant.

Over the long term a typical 10:1 revenue-cost ratio still makes the effort worthwhile in many cases: A 0.25-micron chip design that costs \$1 million to bring to market may earn \$10 million, for example, while a higher-end, 90-nanometer design that costs \$25 million might earn back \$250 million. Customization has also opened new applications and markets for high-end designers, as basic chips have become increasingly commoditized. In addition, demand for higher-end chips has grown well beyond narrow specialty applications in a few technology-intensive industries to high-volume, mass markets like automobiles, personal computing, mobile phones and consumer electronics.

The Fabless Alternative

For startups and smaller boutique design firms as well as for larger, more vertically-integrated producers, managing up front costs is critical in maintaining margins and competitive advantage. As the Semiconductor Industry Association describes the current market:

"Fabless companies focus on designing and marketing competitive products, while farming out wafer production to foundries. The foundries are able to invest the billions of dollars necessary to upgrade and grow their capacity by spreading the

costs among a large number of fabless customers. The fabless/foundry model also offers flexibility in terms of mixed lots and an individual company's peak demand. Some integrated device manufacturers...have chosen to go "fablite" for part of their product lines, while continuing to internally produce other products.

The fabless/foundry model has grown rapidly, with the fabless part of the business now representing 20% of the total U.S. industry. The fabless/foundry model has been primarily in digital logic chips. Microprocessors, DRAMs, analog and discrete products continue to be produced primarily by Integrated Device Manufacturers, or IDMs.

Industry experts differ on how much further this model will grow. Some experts argue that high costs of 300mm wafer fabs will lead to more companies choosing to become fabless, or fablite. Others note that below 0.25 microns, the physics of the devices on each chip becomes increasingly difficult and that integrated device manufacturers who can better couple design and process engineering have an advantage."

After falling behind Japan in the mid-1980's, U.S. semiconductor manufacturers regained the market share lead in 1992 and have held about 50% worldwide market share since 1997. In 2005, the U.S. industry had \$110 billion of the \$228 billion world semiconductor market, about 48%; North American fabless companies accounted for about \$29 billion, or about 26% of U.S. industry revenues. U.S. designers and manufacturers accounted for 61% of the Americas market, 51% of the European market, 24% of the Japan market, and 52% of the remaining Asia-Pacific market.

Of the major product markets, the U.S. was strongest in the micro market—including microprocessors and digital signal processors, with an 83% share. U.S. producers hold a 47% share in MOS Logic, which includes many of the semi-custom products such as field programmable logic devices; a 58% share in analog chips for consumer, computer, automobile and telecom applications; and a 21% share in memory chips.

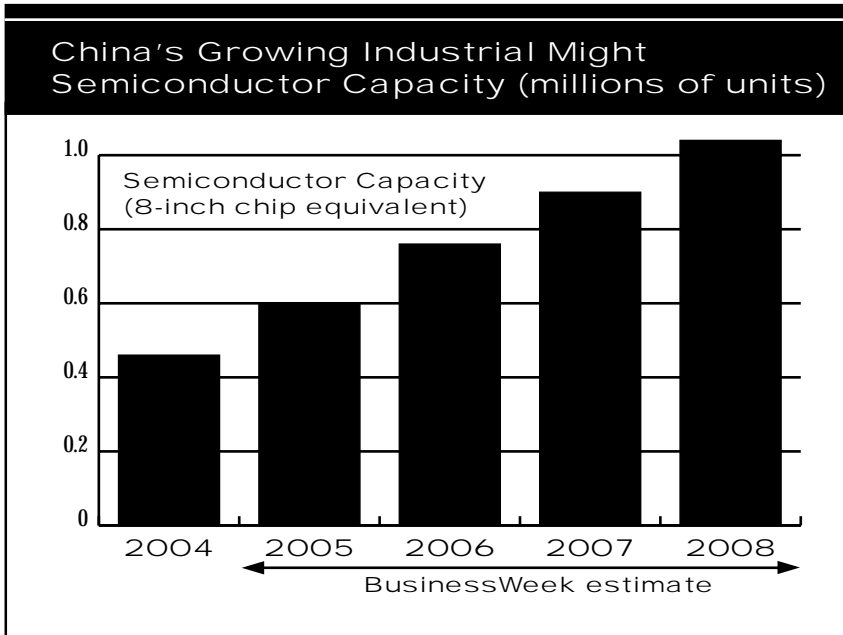
From 1997–2005, as U.S. market share has held steady at around 50% (and ended at 48% as mentioned), Japanese producers have seen market share decline from 30% to 23%, and other producers—some Korean and European, but mainly in Taiwan and the PRC—grow from 20–29% of the global market.

China Grabs Foundry Market Share

Well into the 1990s, chip design stayed in Silicon Valley and fabrication shifted to Taiwan foundries operated by Taiwan Semiconductor Manufacturing Co., United Microelectronics Corp. or a multitude of smaller production firms. Today TSMC and UMC account for more than half of total foundry capacity in Asia, and the largest concentration of 300mm wafer capacity in the world. They easily dominated the \$19.5 billion global foundry market in 2005 (\$16.5 billion generated by pure play foundries, and another estimated \$3 billion from foundries operated by

Ties That Bind

IDMs such as Intel, Texas Instruments and NEC). The next largest foundries are China's Semiconductor Manufacturing International Corp. (SMIC), Singapore's Chartered Semiconductor Manufacturing, IBM, Japan's NEC Corp. and two South Korean foundries. Taiwan chip companies, designers and producers earned \$34 billion in revenues in 2005—nearly four times the \$8.7 billion total for mainland firms.



Competition across Greater China is heating up. SMIC has quickly grown to become the world's third largest foundry with more than 6% of the global market. In early 2006 Germany's Infineon Technologies AG announced it would share its 90-nanometer memory chip and 300mm silicon wafer technologies with the Chinese foundry. In August 2006 Taiwan's Ministry of Economic Affairs lifted a ban on transfer of 0.18-micron chip technology and plant equipment to the mainland by Taiwanese firms. Still, analysts expect that it will take 5–10 years for the mainland to match Taiwan producers and global IDMs in terms of scale and quality of production runs. Foundries account for 69% of total Chinese wafer plant capacity.

A growing share of chip manufacturing capacity has migrated to China from elsewhere in Asia—including Taiwan—as well as from the U.S. TSMC, for example, has a \$900 million fab plant in Shanghai. Intel, with help from tax breaks under China's "Go West" incentive program to help interior provinces, completed one \$375 million assembly and testing plant in Chengdu in 2005, and plans three others; it has been assembling and testing flash memory and other PC chips at a \$500 million Shanghai plant since 1999, and has three R&D centers throughout China.

In addition, PriceWaterhouseCoopers reports that at least five significant Chinese fabless design firms each reported revenues ranging from \$30–56 million in 2004. Two of them, Vimicro and Zuhai Actions Semiconductor Co., launched successful NASDAQ placements. It should also be noted, however, that in 2004 the top 26 Chinese semiconductor companies had combined reve-

nue of less than \$1 billion, and none had revenues greater than \$100 million. In 2005 the top 32 Chinese semiconductor companies had combined revenues of just over \$1.5 billion, and three had revenues of \$150–200 million.

Cost vs. Innovation

The Semiconductor Industry Association (SIA) forecasts a \$249.6 billion worldwide chip market in 2006. Asia-Pacific is by far the largest regional customer for semiconductor products, having doubled its share of total global consumption from 22% in 1997 to 45% in 2005. Half of this gain occurred in 2000–2002 as a result of a major shift in electronic equipment manufacturing from the U.S. to Asia (excluding Japan), as U.S. companies outsourced portions of their production to reduce costs and gain access to emerging markets such as China. The U.S., a leading global consumer during the 1990's, is now tied with Europe as the smallest region in terms of semiconductor sales.

According to SIA, U.S. capital affiliated companies represented 35% of total leading-edge capacity in 2000, when leading edge-capacity was defined as capacity capable of producing at 0.3 microns or less. By 2005, when leading edge capacity was defined as 0.12 microns or less, that share had declined to 14%. U.S. producers, including some who have built facilities in Taiwan, China and other offshore locations, voice concern about foreign tax breaks and investment incentives that have helped transfer foundry capacity to Asia. They point to as much as a \$1.1 billion cost differential to build and operate a 300-mm wafer foundry for 10 years, with 70% of that differential in tax benefits, 20% in capital grants and only 10% in relative labor costs. As a result, two-thirds of such facilities planned or in operation are in Asia.

Incentives aside, China currently accounts for about 25% of global chip consumption, up from 7% in 2000. By 2010, however, Chinese demand is expected to account for one-third of a global market worth \$300 billion. When assessing the development of China's semiconductor industry, however, it is important to consider not only volume, but also technological level. While production by multinational corporations largely focuses on global markets, most Chinese production is for a domestic market with lower technological needs—typically a 6" wafer. While newer companies like SMIC and Grace are producing at the 8–12" level and are beginning to sell overseas, most older Chinese fabs are dated.

China's 11th Five-Year Plan, which begins in 2006, calls for a \$37.5 billion investment in the domestic integrated circuit (IC)/semiconductor industry, including five IC design companies, ten 200mm wafer production lines, five 300mm lines and development of the domestic equipment industry—most notably sophisticated 65-nanometer laser etching equipment for the 300mm production lines.

Despite its growth, local production currently meets only 30% of China's domestic market needs; the rest is imported. The domestic market will therefore continue to drive China's chip production. While some Chinese firms will seek global markets, because of the gravitational pull of its domestic market Chinese chip technology is expected to lag significantly behind that of the

Ties That Bind

U.S. for at least another decade. In niche areas such as cell phone cards, however, Chinese capabilities may rise more rapidly.

In 2004 the U.S. and China settled a World Trade Organization complaint, initiated by U.S.-based IDMs, which challenged China's policy of rebating a 17% value-added tax on semiconductors produced and sold domestically. The Taiwan government—concerned about the potential economic dependence created by the \$100 billion in Taiwanese investment already in China—has placed restrictions on new semiconductor investment and technology transfer on the mainland.

Although semiconductor equipment manufacturing is identified as a goal in China's five year plan, because of its high capital costs, its intellectual capital intensity, and the speed with which the technology advances, China isn't likely to develop a major semiconductor equipment manufacturing capability in the near future. This means China will remain an attractive market for Bay Area equipment producers. U.S. producers will need to compete on price, however, with the used equipment being imported for lower-tech fabs.

Bay Area Connections

San Jose's **Intel Corporation**, which has fabs in the United States (6), Israel and Ireland, and assembly and/or testing facilities in Costa Rica, Malaysia and the Philippines, operates three plants in Shanghai, and recently invested \$200 million in a fourth in Chengdu, a city of 10 million in Sichuan Province, deep in China's interior. Despite its remoteness from Beijing and from the major coastal centers where most foreign companies locate, Chengdu offered labor costs 30% lower than Shanghai and generous local incentives. To support its venture into virgin territory, Intel trained most of its workforce from the outset. Production workers were sent to train at Intel facilities in Malaysia and the Philippines, and courses on semiconductor physics and in factory processes were created at local schools and universities. Since then its first plant in Chengdu has ramped up more quickly than expected, and construction is underway on a second facility. With the opening of its second Chengdu plant, Intel will have 6,000 employees in China.

Intel rival **AMD** does its product and systems R&D for microprocessors in the U.S., with additional design and development teams located in Germany, China, Japan, India and Korea. Manufacturing of its microprocessors takes place at five facilities: two wafer fabs in Dresden, Germany and three assembly and test facilities in Singapore, Penang (Malaysia), and Suzhou (China). AMD also operates eight flash memory manufacturing facilities, including wafer fabs in Austin and Aizu-Wakamatsu (Japan), and assembly and testing facilities in Bangkok, Kuala Lumpur, Penang and Suzhou. Several AMD sales and marketing offices in China target its growing market, particularly for flash memory products used in mobile phones.

A number of Silicon Valley firms have found lucrative markets as suppliers to the foundries. Mountain View-based chip design software maker **Synopsys**, for example, has been active in Taiwan since 1991 and currently has two offices there—in Taipei and Hsinchu—as well as offices in Hong Kong, Beijing, Shanghai and Shenzhen. Synopsys software helps designers of

complex chip products detect and avoid functional, power, signal and other problems early in the design process.

Cadence Design Systems, Inc. of San Jose is another chip design software provider serving the China market, with an R&D center in Hsinchu, Taiwan and sales offices in Hong Kong, Taipei, Beijing, Shanghai, Shenzhen and Chengdu. Cadence also has strategic partnerships with TSMC, UMC, SMIC and Chartered, supporting the Taiwan foundries' move to 65-nm production. Its agreement with Hong Kong's Applied Science and Technology Research Institute (ASTRI) provides electronic design automation technology for ASTRI's R&D work in low-power integrated circuit design, wireless/wireline telecommunications, consumer electronics and materials and packaging design for Hong Kong and Pearl River Delta manufacturers. Fremont-based **Lam Research** has provided foundries in China with wafer cleaning, etching and chemical planarization equipment, including a \$33 million sale of advanced etch systems to a Philips-TSMC-Singapore Government foundry joint venture, Systems on Silicon Manufacturing Co., and a \$100 million etch and planarization order from SMIC in 2002.

China's Two Chip Industries

A December 2005 study for the Alfred P. Sloan Foundation, "The Globalization of R&D in the Chinese Semiconductor Industry," by David J. Teece and Henry W. Chesbrough of the UC Berkeley Haas School of Business' Institute of Management of Innovation and Organization (IMIO) looks at the implications of China's chip producers on global competition and the worldwide customer base:



The Chinese semiconductor industry is best thought of as two distinct industries sharing a common SIC code. A strong, vibrant, and globally competitive semiconductor industry is emerging in China. The Chinese government has been aggressive in providing attractive incentives for foreign investment.

This new competitive sector possesses substantial industry experience, largely provided by experienced personnel returning from the U.S., and experienced executives and engineering from Taiwan. It possesses some highly advanced technology, with three 12" (300 mm) fabs already built, and more on the way. It has been able to attract significant foreign investment capital from Taiwan, the U.S., and Europe to finance the construction of these highly expensive facilities. It contains some sophisticated design firms that are creating world class products that are gaining share in the world market.

Ties That Bind

But there is a second industry that shadows the one depicted above. This second industry is made up of formerly state owned enterprises (SOEs) that lack the money, the talent, and the basic management processes to compete on the global stage. These companies are employing rather obsolete equipment and inferior technology, and they are serving a largely domestic market whose requirements are far different from those of the global market. They are starved for investment funds, they lack significant management experience in a market economy, and they are constrained in their employment relations with the people they have. Indeed, the government remains the largest shareholder of these companies, and often enjoys majority ownership. And the Chinese government is far from monolithic.

The national ministries compete with one another for influence, and there are significant tensions between the provincial and town governments and the national government. Typically, one of these entities has ownership in an SOE, but not the other entities, who have different ownership positions in rival firms. And while there are a few highly capable design firms in China, the sheer number of design firms operating in China (over 600 at this point) means that most are facing a likely shakeout, a process that will be fraught with problems in a single party state that cares deeply about maintaining social stability.

Within the industry, there are multiple business models in play, as firms compete in the market with different configurations of skills and focus. The older firms tend to utilize a quasi-vertically integrated business model. This model has conferred certain benefits in China, particularly the ability to employ administrative means to achieve economic coordination in a context where intermediate markets are thin or non-existent. But this model has encountered significant limits in its ability to support companies able to compete in the global market, because the products created by these quasi vertically integrated firms do not fit with global market requirements.

Almost all of China's 600 integrated circuit (IC) design firms are new. Culturecom Holdings, maker of China's V-Dragon Central Processing Unit (CPU), switched from comic book publishing to IT in 1999. Comlent, maker of China's first radio frequency integrated circuit (RFIC) used in cell phones, is just three years old. China's star design house, Vimicro, which has a 60% global market share in PC multimedia chips, was founded in 1999, an

elder among the IC design firms. Spreadtrum, provider of 100% Chinese IP chips and software for wireless applications, first opened its doors in 2001.

The explosive growth is not limited to design. China's only SI equipment provider, Advanced Micro-Fabrication Company (AMEC) is slightly over a year old. China's chip foundry prodigy Semiconductor Manufacturing International (SMIC), founded in 2000, now has a 6% global market share, making it the third largest foundry in the world in terms of revenue.

Younger firms have imitated the greater division of innovation labor in the global semiconductor industry with the foundry-cum-fabless business model. This model seeks to leverage the intermediate markets for technology (or for foundry capacity) that have emerged in the U.S., Europe, and Taiwan. However, the protections around intellectual property and some of the supporting institutions for these intermediate markets are not fully formed in China, creating hazards for the fabless approach in China as well. Notwithstanding these hazards, the latter business model seems likely to be the only model capable of enabling Chinese firms to penetrate the global market for semiconductors.

There are many possible outcomes to the insights and trends revealed through our interviews. Indeed, there are many possible unforeseen contingencies that could completely reorder the industry. But, based on the first hand knowledge of our interviewees, some important implications, predictions and guesses can be derived:

- Autonomous, privately run, technologically advanced Chinese SI firms (the outwardly focused segment) are the equal of any globally competitive firm and are probably the best hope for China's future.
- The elements of the semiconductor industry with the best government connections and the highest levels of government support (the domestically focused segment) are likely to follow the path of most SOEs into either radical reform or extinction. This misallocation of very limited resources could seriously retard China's SI development.
- The domestically focused semiconductor industry segment will likely continue to lobby for exclusionary domestic standards (a la WAPI), which, if they are

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implemented, risk restricting the national technological level and preventing Chinese entrepreneurs from achieving success globally.

- China's current "chip craze" will eventually subside and the fragmented markets are expected to consolidate, leading to dominance by a few globally capable firms in each section of the semiconductor industry ecosystem. Minimum efficient scale may not be soon possible in some areas such as cutting edge CPUs and advanced fab equipment, leaving a choice between 1) using legacy technology, 2) sourcing from international markets, or 3) paying heavy and perpetual subsidies to obtain a security and prestige benefit.
- The low cost (labor and construction) environment in China is almost certainly temporary. Investments made today that are duplications, contribute to over capacity, or are made in firms that are not truly globally capable have the very real potential of limiting China's future prosperity and prestige. There is a "window of semiconductor industry development opportunity", and very limited funds to invest.
- China's internal barriers to growth, especially the desire by local governments to create and protect small "prestige" SI clusters, have the potential to handicap Chinese entrepreneurs in achieving global success. The provincial and even municipal customs inspections, regulations, licenses, and product certifications designed to exclude both foreign and intra-Chinese imports may very well reduce China's global competitiveness in many industries, not just semiconductors.

For multinational companies (MNCs), China's environment again offers opportunities and risks. The institutional support for IP protection is still weak, which limits MNCs' desire and ability to invest substantial resources in China. A second limiting factor is that the domestic market's needs are far from typical of the world market, not only in the costs and price points of products (as in consumer electronics, for example), but also in the formats and standards that the world market requires.

MNCs to date have utilized their China operations to gain access to the China market, and to establish an export platform to the rest of the world. These twin activities have been quite

distinct to this point, owing to the market differences noted above. This reduces the synergies between the activities for the MNCs. MNCs have also been careful to partition their technology deployment within China, so that individual portions of a system are built in China, but the overall systems integration resides elsewhere, in a region with much stronger IP protection. This enables the MNCs to manage the risk of IP misappropriation, but deprives the Chinese industry of a vital source for developing more overall systems knowledge.

Our overall conclusion is that China's semiconductor industry is poised to be a significant contributor to the global industry over the next decade. But the industry faces tremendous adjustments that must be made to raise the talent, management, and technology to globally competitive levels. Given the pervasive ownership of so many companies by entities within the Chinese government, the role of the government will be critical to achieving this transition. The Chinese industry needs some globally leading systems firms (e.g., Huawei, Lenovo, Haier) in order to provide a systems-level understanding of future needs, and the resources to help enable a response to these needs. China also requires a strong research base in semiconductor technology, something that is sorely lacking to date. The existing research system appears to be balkanized, with too little advanced research, too much competition resulting in duplicative incremental work, and a second-rate university research capability.

The Chinese government must of necessity be involved in these adjustments, if for no other reason than it is the largest shareholder of most of the Chinese semiconductor firms. And China's domestic industry may become a significant driver of technological advance for the whole economy. Yet the Chinese government lacks a unified perspective towards the industry, and similarly lacks experience in managing such a transition in a market economy. The severe competition between governmental entities must somehow be ameliorated, or directed towards a shared common goal.

MNCs also have a crucial role to play in the development of the Chinese industry, as creators of IP, know-how, and systems knowledge. Chinese government policy should aim for more neutrality in balancing the demands of domestic firms and MNCs. The rhetorical support already extant for stronger IP

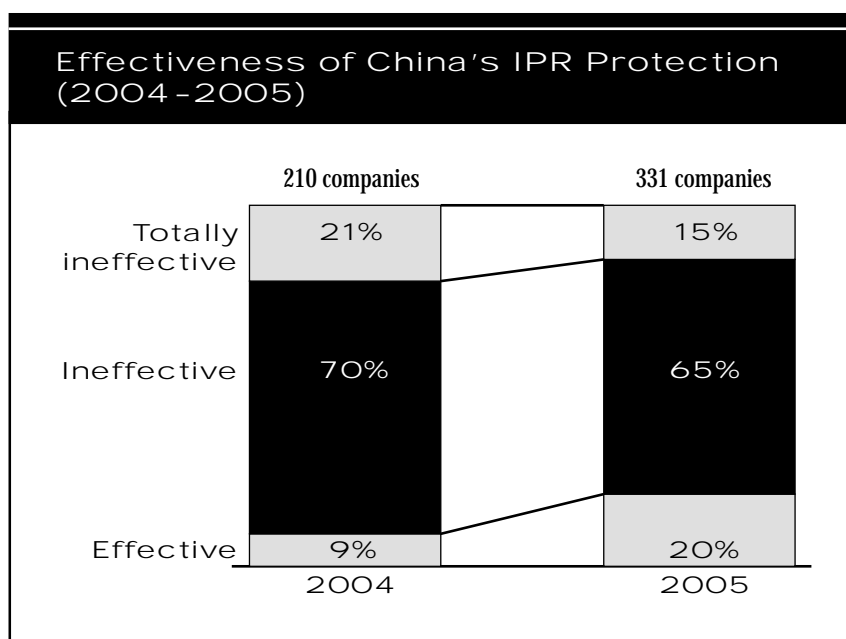
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protection should be followed by actions that bring such protection into reality. And this is not a fantasy: there are constituencies inside of China that seek stronger IP protection precisely so that they can upgrade their own technology and skills base, and appropriate an adequate return from those investments.

The U.S. government must also make adjustments in its approach to the Chinese semiconductor industry. Its attempts to limit access by Chinese firms to advanced semiconductor technology have merely shifted the supply of those technologies from the U.S. to Europe and Japan. China will develop a world class semiconductor industry in time, and the U.S. lacks the ability to alter that trajectory. In our view, the emergence of a globally competitive Chinese semiconductor industry will take substantial time, and is a development to be welcomed, not feared. It will likely propel the two largest economies in the world to become still more interdependent and, if managed well, can increase prosperity in both countries and worldwide.

The Intellectual Property Hurdle

Whether a U.S. company is a manufacturer of clothing or consumer goods, or a producer of semiconductor equipment or software, IP concerns in China sooner or later must be dealt with. Protection of intellectual property topped the list of post-WTO concerns among foreign companies exporting to and investing in China, in a U.S.-China Business Council 2005 survey. Although the PRC has laws on its books protecting foreign patents, trademarks and copyrights—and in 2001 strengthened those laws to conform with WTO standards for Trade-Related Intellectual Property Rights (TRIPS)—enforcement has been uneven at best in areas ranging from CDs and DVDs to software to pharmaceuticals to luxury consumer goods. IPR protection is slowly improving, particularly in major business centers like Beijing and Shanghai, but falls off sharply in more remote jurisdictions.



*Sources:
2004–2005
AmCham-China and
AmCham Shanghai
Business Climate
Survey*

Counterfeit goods account for as much as 8% of China's GDP, and cost U.S. business an estimated \$20–24 billion annually. A range of factors—widespread technology transfer through joint ventures and contract manufacturing; a legal framework that has historically rewarded first users over developers; a government under economic and political pressure to modernize its economy and state-owned enterprises through technology transfer; pressures on new private enterprises to quickly become globally competitive; and cross-border flows of engineering talent and equipment—quickly commoditize products and neutralize first movers in the world's largest and fastest-growing emerging market.

In response, firms have struggled to keep innovative, proprietary activities outside of China's borders and beyond the reach of Chinese partners. Manufacturers develop products for the China market with a minimum of features, or recycle older product lines. Changing business models favor strategies for licensing agreements and network-based services that retain control of IP and/or price in potential abuses. These IP concerns constrain the extent and quality of foreign investment in China.

A growing number of Chinese firms whose competitive futures rely heavily on technology, process or other innovations have begun to register patents and trademarks, and have brought IP cases as plaintiffs in Chinese courts. As Chinese companies and industries advance, the concept of IP protection is as much about education at the central and local government levels and in private enterprise, as it is about law enforcement.

Managing IP Value

In a 2005 report, “Redefining Intellectual Property Value: The Case of China,” PriceWaterhouseCoopers analysts Chris Cooper, Ken DeWoskin, David Hoffman and Alan Morrison examine the state of IP in China and offer a new perspective on retaining value and preserving competitive advantage in a volatile emerging market. Portions of their paper are excerpted below.



China's emergence as a manufacturing power has benefited multinational companies (MNCs) seeking to leverage its low-cost labor force and seemingly unlimited capacity. Outsourcing low-value manufacturing operations to China enables corporations to pursue value chain specialization, focusing more of their energies on high-value activities such as marketing and R&D. China in turn has come to dominate outsourced manufacturing, supplying as much as 50–80% of global production in many product categories.

The evolving U.S.-China sourcing relationship has transformed how products are developed and, even more importantly, how they are valued. Beyond that, it has altered the structure of supply chains, the segmentation of value chains, and the relative value of the hard and soft constituents of products and services.

Certainly, low-cost manufacturing has accelerated the devaluation of many product categories, yet this impact is only the most obvious one. China's unique relationship with countless MNCs, as a global manufacturing partner and an emerging competitor, is altering established conventions about the definition, role, and protection of intellectual property (IP). The growing capabilities of Chinese manufacturers, combined with their rapid appropriation of IP (through both legal and illegal means) are having an unprecedented impact.

Chinese manufacturers across industries have been able to acquire IP and apply it quickly in export markets. With rapid capacity increases in the country and non-economic practices that are the legacy of state-owned enterprises, the resulting market volatility can undermine the ability of companies to seek redress when their IP rights are infringed. Even in places where administrative and legal procedures are well established, companies may not have the time to enlist government help quickly

enough to stop unfair or illegal practices before their market position is permanently compromised.

Traditional defenses such as antidumping complaints, for example, which worked in the past for semiconductor manufacturers have not proven effective for consumer electronics more recently. Concentration of buying power among a few large discount retailers in the United States has compounded the problem.

Regulators, trade negotiators, and courts struggle to define what can be protected and how protection is to be measured and enforced across a wide range of categories. The result is a turbulent, high-risk IP environment that may persist for the foreseeable future. And it is not confined to only China; the country's own global expansion initiative has forced the issue to become one of global importance. Thus, regardless of whether a company is doing business in China, it must adapt to these significant changes.

Key Findings

Chinese manufacturers are ultra lean and ultra agile. They can quickly become effective price and volume leaders in global manufacturing. Challenges to the established IP rights paradigm in the developed world will mount as China's influence on global product markets grows. The issue is not only one of IP infringement, but more importantly the pace and scale at which derivative products—at significantly lower price points—are brought to market by Chinese players, collapsing pricing structures and shortening the profit cycles of products.

The preponderance of corporate value in mature markets is in intangibles, and a sizable percentage of that value is exposed in emerging economies involved in outsourced production. In 1998, as much as 85% of the value of U.S. corporations in the Standard and Poor 500 index was in intangibles, up from 38 percent in 1982. By 2005, significant amounts of these intangibles had already been transferred—legally and illegally—from foreign companies to Chinese corporations. Tactical and legal, low-cost acquisitions of operations and facilities that include IP—from struggling foreign companies or vertically integrated MNCs who seek to shed their lower value manufacturing units entirely—are accelerating this movement.

Technology transfer has set China up to become a global manufacturing and IP powerhouse. Ever since China opened its doors to foreign investment, the Chinese government has consistently demanded technology transfer to its own manufacturing sector from foreign companies that have a presence in the country. The goal is to continue China's rapid economic growth, and eventually achieve independence from foreign investors, by appropriating commercially proven technology as well as creating new technology on its own.

Much sponsored research in China is not dedicated to scientific discovery or true innovation. Rather, the focus, in many cases, is on developing derivations of patented products to circumvent royalty fees. China spent less than 6% of its total R&D budget on basic research in 2003, compared to 19% for the U.S. Stated economic development goals notwithstanding, government-sponsored R&D in China is primarily dedicated to developed and applied—rather than basic—research. Funding priorities continue to favor larger SOEs or former SOEs, and investment is largely focused on commercially-proven end-product level innovations, cost reduction, and incremental improvements rather than more innovative and basic, higher risk IP.

China continues to place the balance point more to the benefit of public good than to private owners. The country's current position on public versus private needs is consistent with its ideological history and social and economic development philosophy. While official Chinese policy at the national level is to maintain a reasonable balance, recent publications by the National Standards Administration of China and draft language in the anti-monopoly laws confirm the emphasis on the public good, with the former requiring concessions from patent owners if their IP is to be included in an approved national standard.

Commercial operations of state-funded companies continue to be unduly influenced by the requirements and directives of the State. Despite moves toward privatization and market-based corporate governance and decisionmaking, China's 200 largest enterprises are experiencing more intense central government intervention than they have in many years through the recently established State Asset Supervisions and Administration Commission (SASAC). In November 2004

SASAC implemented an administrative order of the State Council to rotate the chairmen, chief executive officers, and other top executives of China's four major telecom operators, side-stepping their "independent" boards of directors entirely. SASAC directs critical financial resources, appoints top managers, implements major state directives such as the "going global" campaign, and oversees restructuring of major players in the pillar sectors.

Reverse engineering, counterfeiting, outright IP theft and other forms of IP misappropriation are widespread in China. Several factors contribute to this, beginning with a deep-rooted ideological and social tenet that shared property takes precedence over private property. Provincial and local governments enjoy broad economic and legal autonomy to act to the "economic benefit" of their citizens. Aggressive local economic development initiatives often ignore or encourage IP abuses, beyond the central government's enforcement reach. Global demand for low-cost products, coupled with highly efficient global distribution networks, favors the smooth flow of goods over customs IP enforcement in many import markets.

The mixed motives of Chinese courts and law enforcement entities often result in outcomes unexpectedly adverse to the rights of IP owners. China's courts have been receptive to legal challenges brought by Chinese companies and associations, arguing that foreign technology royalty agreements unfairly restricts the growth and competitiveness of Chinese domestic manufacturers. In general, the government has taken a view that maintaining political stability and increasing employment and living standards necessitates some tolerance toward illicit use of IP.

High levels of IP transfer occur globally in many other ways that cannot be prevented by legal measures in any case. IP beyond patents, copyrighted material, trademarks and trade secrets are frequently transferred when skilled employees move from one company to another. Large numbers of retired technical specialists from U.S. and Europe find opportunities for second careers in China, passing on valuable scientific and engineering expertise to startups and established companies. Government funds and incentives support startups that in turn attract returning graduates and workers, as well as venture funding and expertise that value those startups' government

ties. Another common practice is IP mining—obtaining another company’s IP illegally in one country and then using it without penalty in other countries where legal systems are poor and IP rights enforcement is non-existent.

China’s challenge to global IP practices began primarily in China’s domestic market and has migrated to foreign emerging markets where IP protection is weak or non-existent. Emerging markets are often of limited commercial interest to MNCs, which might not bother to register trademarks, copyrights and patents in them. There may also be countries where commercial involvement is difficult or illegal. China’s development strategy includes the idea of “eating global giants from the feet up”; that is, becoming engaged in and gaining significant shares in emerging markets where global corporations are not yet interested. Chinese companies with IP liabilities—primary commodity refiners or automotive and IT equipment manufacturers, as well as media and pharmaceutical counterfeiters, are actively selling products and building plants in these locations.

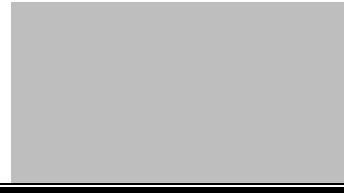
Recommendations

The following is a summary of key IP value management recommendations contained in this report:

- Assume that the IP challenges in China and other emerging low-cost countries will not be significantly mitigated for many years.
- Reduce dependence on conventional IP protection mechanisms.
- Create and preserve IP using a value management approach that attunes core operations to the task.
- Defend global markets by anticipating and responding to changes in emerging markets.
- Maximize manufacturing flexibility to preserve the value of innovation.
- Tailor pricing and marketing to fit accelerated versioning capabilities.
- Increase service capabilities to preserve product value.
- Consider merger and acquisition (M&A) and partnering activities that can take IP infringing capability out of the market.

Investment: Building Global Businesses in a New China

- Encourage positive legal development in China by engaging at various levels with government, business and academic leaders.



Ties That Bind

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Building Bridges, Leveraging Assets

“The Bay Area has historically been the gateway to Asia. The modern practice of global portfolio management has elevated China’s role in global supply chain management. This also reflects increased demand for the Bay Area to take a leadership position by utilizing its asset advantage in technology, capital goods and intellectual property.”—Gene Huang, Chief Economist, FedEx

By any measure—people, trade, investment, capital, culture—the San Francisco Bay Area is heavily invested in Greater China. The two areas’ fortunes have been closely interconnected for more than 150 years, starting with the first Chinese immigration to America. What has emerged is a complex, highly diversified, and mutually beneficial relationship. But in a global economy it would be a mistake to take the relationship for granted.

Northern California has been a valuable resource for China, providing education, capital, technology, skilled business management and financial opportunity. In return we have obtained skilled professionals—scientists, engineers, researchers and managers; and access to a vast, rapidly expanding market. However, neither technology, markets, or China itself are static.

Chinese universities and technical institutes turn out more than 350,000 engineering graduates annually, and the quality of Chinese educational institutions is growing. Incentives from cash grants to startup funding, to technical support after graduation, to exemption from military service (Taiwan), are offered to students who stay home. The scale of China’s market offers talented entrepreneurs and managers a unique opportunity to build global companies and industries from scratch—something more difficult to do in the more mature U.S. market. Business opportunities for bilingual MBA and postgraduate technical professionals in China are wide open.

Declining numbers of foreign student applications and H-1B visas since 2002 in part reflect this. The bursting of the tech industry bubble in 2000–01 reduced Asia-U.S. travel during the SARS and avian flu scares, and post-9/11 safety concerns about visiting the U.S. were contributing factors. However, post-September 11 security policy has also made it more difficult for students and professionals in specialized fields to obtain J-1 and H-1B visas.

Technology companies, working in advanced areas of semiconductor, nanotechnology and materials, optoelectronics, biomedicine and similar research, need an assured supply of scientists and engineers from top universities. Up to now, a significant share of this talent pool, particularly in the Bay Area, has come from foreign nationals from China and Taiwan. The flow of people and information worldwide warrants security and intellectual property concerns, but it is questionable

whether restrictive visa policies are the most effective way to address these issues, particularly when the restrict U.S. access to the best global talent.

Chinese investment in the Bay Area is still mostly in commercial and hotel property, angel and venture investment in Silicon Valley technology companies, and small-scale retail. A few investments have made headlines, such as the \$1.05 billion purchase of San Francisco's Bank of America Center by a Hong Kong investor group in September 2005, and Hong Kong-based Cornerstone Overseas Investment's acquisition of Emeryville toymaker Wham-O Inc. in January 2006. China National Offshore Oil Co. (CNOOC)'s bidding war with San Ramon-based Chevron Corp. for Unocal Corp. drew the most attention, following on the heels of Lenovo's acquisition of IBM's PC manufacturing unit and the competing bids by Haier and Maytag for Whirlpool.

"Greenfield" investments in new plants and office parks, along with corporate mergers and acquisitions, have up to now been largely one-way—from the U.S. to China. That may soon change, however. Cumulative Chinese overseas investment at the end of 2005 totaled \$57.2 billion, according to China's Ministry of Commerce. Chinese direct investment overseas during 2005 totaled \$12.26 billion, a 123% increase over 2004. Chinese consumer goods and technology firms may spend as much as \$80 billion in overseas investment in 2005–06. Sitting on close to \$1 trillion dollars in foreign reserves, China's government is giving the green light for its companies to invest abroad, and in the coming years they will be looking for complimentary mergers and acquisitions, strategic partnerships and equity investments that will help them build global brands and distribution networks, and access markets and technology. This presents an opportunity for the Bay Area.

This road may prove bumpy at times as some transactions are likely to raise security or intellectual property issues, including questions about the so-called "deemed exports" of technology through shared personnel and data within a merged entity.

In the course of conducting interviews and other research for this report, a number of ideas surfaced for ways to expand and add value to the Bay Area-China relationship. While not exhaustive, proposals focused in two main areas: strengthening U.S. and Bay Area competitiveness by influencing federal and state policies with respect to education, immigration, and funding for research; and leveraging the Bay Area's distinct assets to increase trade and attract even more China-related business and investment in the future.

Strengthening Economic and Technological Competitiveness

China's growing economic and technological capacity will pose both opportunities and new challenges for U.S. and Bay Area technological leadership. Its assertion of a greater global role will require a nuanced approach to the U.S.-China relationship, to take account of rising competition as well as opportunities for cooperation. In that evolving relationship, it is critical that the U.S. and California invest in and leverage their competitive strengths:

Building Bridges, Leveraging Assets

1. *Strengthen math and science education at the elementary, high school and university levels.* Underperformance by U.S. elementary and high school students in math and science, aggravated by inadequate training and numbers of math and science teachers, undermines our long-term competitiveness by reducing the pool of scientific talent.
2. *Promote continuous workforce skills development and training* It is imperative that industry have the domestic workforce it needs, and that workers have the skills and training required to meet the competitive demands of rapidly changing global markets.
3. *Keep the door open for foreign talent, particularly from China.* Chinese students and entrepreneurs are making a unique and important contribution to the U.S. and Bay Area's economies, particularly in Silicon Valley. The Federal government should consider streamlined visa and immigration procedures designed to attract and retain educated scientists, researchers and other professionals from other countries, including China.
4. *Strengthen Federal and state funding for basic research.* Federal support for basic research, particularly in the physical sciences, is critical to long-term technological development and innovation. In California, the University of California plays a critical role in supporting California's technological leadership. Support for research, cooperative programs between the universities and industry, and technology commercialization programs should be priorities.
5. *Ensure that Federal trade and investment policies reflect the reality of global markets.* Surveys show that businesses and ordinary citizens have a much more positive view of China than Congress, a difference often reflected in Congressional debates. China should be required to fully implement its market-opening commitments under the WTO, U.S. policy should be vigilant against backsliding, predatory policies that damage U.S. commercial interests should be confronted, and labor conditions should be monitored. For U.S. businesses, however, policy uncertainty in Washington can sometimes be greater than policy uncertainty in Beijing. U.S. policy toward China is easily politicized, and often reflects an over-simplified view of what has become a highly complex and increasing deep economic relationship.

Strategically leverage the Bay Area unique assets to expand cultural, academic, trade and investment ties:

6. *Elevate the priority of Chinese-language instruction in elementary, high school and junior college systems.* Bilingual skills in Chinese will be in growing demand if current business and demographic trends continue. The availability of Chinese language instruction should therefore be expanded in California and particularly in the Bay Area. Because of the relative difficulty in learning spoken and written Mandarin or Cantonese, courses should be offered to students early, in both standard instruction and immersion programs beginning in primary school.
7. *Promote the Bay Area as a location for Chinese investment.* As Chinese companies begin investing overseas, the history, cultural receptivity, and educational, financial and technological assets of the Bay Area make it an attractive destination. While most manufacturing investment may go to lower cost sites, the Bay Area offers an attractive setting for headquarters, R&D,

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finance and other knowledge-based activities. While much of this may happen on its own, it may not likely to reach its full potential without a strategy and promotion. As an initial step in that direction, regional leaders should consider a survey of Chinese companies, their overseas expansion plans, and their perceptions of the Bay Area as a place to source goods and services, invest, or locate.

8. *Support China-focused regional protocol and business support entities to host programs, facilitate business-to-business relations, receive delegations and represent Bay Area interests.* Despite the depth and breadth of the Bay Area-Greater China relationship, there is no overarching regional entity to host and coordinate the many Chinese delegations visiting the region, explore mutually beneficial exchanges, or to promote Bay Area companies and expertise. As China encourages enterprises to “go outside” and build brands overseas, small and medium-sized companies on both sides of the Pacific stand to benefit from coordinated trade and investment development efforts.

An improved regional capacity to focus and support these activities could expand both the Bay Area’s profile in China and business opportunities for local companies. Alternatively, cities and businesses in their communities should encourage the development of China-related entities that serve the region. A World Trade Center complex, for example—similar to the trade exhibition, conference, and office facilities that exist in Asia, could advance that goal. In 2006 the Bay Area World Trade Center proposed the conversion of the Henry J. Kaiser Convention Center in Oakland as a World Trade Showcase Center, patterned after the Taipei World Trade Center in Taiwan. . That proposal was turned down by Oakland’s City Council, in favor of reuse of using the facility as a new main library. The developers are still looking for a West Coast site that may or may not be located in the Bay Area.

Separate from this proposal, but on a parallel path, the Chinese Consulate General is exploring the creation of “China House,” a facility which that would be based in the Bay Area with the job of introducing Chinese and American buyers and sellers; this potentially could include a North America exhibition facility for Chinese products located in the new World Trade Showcase Center. Projects such as these can help raise the profile of the Bay Area in China, support business development, and attract new trade activity to the region.

9. *Increase capacity at, and logistical access to, the Port of Oakland.* Ten percent annual growth in freight volume compounds quickly. While the Ports of Los Angeles and Long Beach capture the lion’s share of California and U.S. ocean-borne trade with China and Asia, both are congested and face serious capacity constraints. Oakland is currently the only major port in California that is underutilized and has excess capacity.

Since most China trade with the United States passes through California ports, Chinese shippers are concerned that California could become a bottleneck and are exploring alternatives, including new ports and routes through Mexico. Thousands of California and Bay Area jobs depend on trade logistics and on California’s role as the principal U.S. gateway for Asian trade.

Building Bridges, Leveraging Assets

To preserve those jobs, capture a larger share of Asian trade, and strengthen the Bay Area's position as an international trade center, state and Bay Area leaders need to address several issues, among them: the capacity and efficiency of port operations; highway access to and from the port; intermodal rail capacity from Oakland to distribution centers in the Central Valley; and rail capacity across the Sierra to major Rocky Mountain, Midwest and East Coast markets.

While not an immediate problem, all three of the Bay Area's international airports are nearing capacity. Consideration therefore needs to be given, and long range planning undertaken, for how the region will accommodate growing numbers of Asian and other travelers, and increasing volumes of air freight. Like the region's ports, logistical access to and from Bay Area highways is a concern.

10. *Promote the Bay Area as a destination for Chinese students and leisure travelers.* The Bay Area, with its many institutions of higher learning, has long been a destination for students from Greater China. In turn, they make a major contribution to the Bay Area's culture and economy. New means should be found to market the Bay Area to Chinese students, including high school, English-as-a-second-language, university and advanced degree programs. As personal income in China grows and more Chinese travel abroad, the Bay Area should also be aggressively promoted as a culturally welcoming, language-friendly destination for Chinese tourists, and facilities developed to support them.
11. *Support cultural activities that strengthen Bay Area-China linkages.* The proposed development of a classical Chinese garden in San Francisco is just one example of the kind of cultural exchange that can raise the Bay Area's profile, strengthen its identity with China, and attract U.S., Chinese and other visitors.

Most of these proposals would not entail large or extraordinary public expenditures, or require a major government initiative. Many represent a simple reordering or extension of existing public priorities, but require improved regional coordination.

It is the conclusion of this report that—apart from seaborne freight moving through the Los Angeles/Long Beach area and capital market activity in New York—the Bay Area has become the premier portal in the United States for U.S.-China exchanges. This is attributable to its unique history; its educational infrastructure; its financial and technological assets; its ability to develop and export new business models; and the extraordinary resources of market intelligence and expertise on China that exist here. As China's economy continues to expand, the Bay Area is in a strong position to participate in, shape and benefit from China's economic growth, and consolidate its role as the nation's leading gateway with China.

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1990 Institute

Toby Bath
HOK Asia Pacific International

Kwok-Yin Cheng
East-West Bank

Dr. Michael Biddle
MBA Polymers

Dr. Henry Chesbrough
Haas School of Business, U.C. Berkeley

Dr. Jean-Marc F. Blanchard
Center for U.S.-China Policy Studies
San Francisco State University

Doris Cheung
Hong Kong Economic & Trade Office

Phil Branham
TBODM (Shanghai)

Darrell Ching
U.S. Commercial Service, Shanghai

Michael Brownrigg
ChinaVest

Silas Chiow
Skidmore Owings & Merrill

Alexander Calhoun
Squire Sanders & Dempsey LLP

Chris Cooper
PricewaterhouseCoopers LLP

Sukhinder Singh Cassidy
Google, Inc.

Scott Cooper
SWA Group

Howard Chao
O'Melveny & Myers

Tim Dattels
Newbridge Capital Partners

Dr. Rongxi Chen
University of San Francisco

Mark Ding
SEMI China

James Fang
San Francisco-Shanghai Sister City Committee

Ties That Bind

Daniel Fineman
Federal Reserve Bank of San Francisco

Brenda Lei Foster
AmCham Shanghai

Dr. William Fuller
ChinaVest

Dr. Thomas Gold
Berkeley-China Initiative
University of California, Berkeley

Dr. Sujian Guo
Center for U.S.-China Policy Studies
San Francisco State University

David Hale
Hale Advisers

Daryl Hatano
Semiconductor Industry Association

Gordon Hein
Asia Foundation

Jane Hennessy
Wells Fargo Bank

Dr. Ta-Lin Hsu
H&Q Asia

Wilfred Hsu
Group Azure LLC

Todd Huang
Shanghai Silicon Intellectual Property Exchange

Shoulei Jiang
Chinese Integrated Circuit Industry Association

Brian Kapavik
URS Corp.

J.W. Keating
SKS Die Casting and Machining, Inc.

Dr. Regis B. Kelly
California Institute for
Quantitative Biomedical Research (QB3)

Thomas Klitgaard
San Francisco-Shanghai Sister City Committee

Dr. George Koo
Deloitte & Touche, LLP/Committee of 100

Wei-Tai Kwok
Dae Advertising

Jane Lee
Taiwan Trade Center

William Lee
San Francisco City Planning Commission

Paul Li
Sanders Squire & Dempsey LLP

Dr. Stanley Lubman
University of California Berkeley

James Mayfield
U.S. Department of Commerce

James Murray
Visa International

Dominic O'Hagan
Wells Fargo-HSBC Trade Bank

Bruce Pickering
Asia Society

Jeremy Potash
California-Asia Business Council

Jane Quan
Berkeley Consulting Group LLC

Bruce Quan
Allbright Law Offices

Daniel Quon
Silicon Valley Bank

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S.F. Asian Art Museum

Dr. AnnaLee Saxenian
University of California, Berkeley

Gene Schnair
Skidmore Owings & Merrill

Weiguo Shen
Shanghai Jinqiao Export Processing Zone

Ray Shick
Gensler

Dr. James Sweeney
Stanford University

Mike Tamaru
Cisco Systems

Lawrence Tang
Invest HK

Robert Theleen
ChinaVest

Robert Tibbetts
Hellmuth Obata + Kassabaum

Lee Ting
W.R. Hambrecht + Co.

Ken Tsang
Hina Group, Inc.

Richard Tsai
Taiwan Trade Center

Dr. Jonathan Wang
Burrill & Co.

Tina Wang
W.I. Harper Group

Rick Wen
Overseas Orient Container Lines

L. Leland 'Skip' Whitney
GVA Whitney Cressman

Dennis Wu
United Commercial Bank

Dr. Chi-Hang Yang
Taipei Economic & Cultural Office

Anne Stevenson Yang
USITO (Beijing)

Amb. Linda Yang
Asian Competitiveness Association

Chin Yao
Achievo Corp.

Dr. Peter Zhou
University of California Berkeley

Min Zhu
New Enterprise Associates

Song Zhu
Squire Sanders & Dempsey LLP

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Bay Area Economic Forum

201 California Street, Suite 1450
San Francisco, CA 94111

(415) 981-7117

(415)981-6408 Fax

info@bayeconfor.org

www.bayeconfor.org



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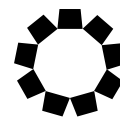
201 California Street, Suite 1450
San Francisco, CA 94111

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