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The State, the Social Sector, and the Market in the Making of China's First Entrepreneurial Venture

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In this essay, I document the case of Chunxian Chen, publicly recognized as the first mover of China's information technology industry in the 1980s. Drawing on the structuration approach, I trace Chen's case at the micro-individual and macro-institutional levels. Unlike scholars who use a top-down perspective, I offer a bottom-up perspective on the origin of China's IT industry during the period of economic reform. Chen's start-up had five stages, in which he visited Silicon Valley; initiated his business; encountered opposition from his supervisor at the Chinese Academy of Science; received support from the government; and went bankrupt. Although Chen's business failed, his individual initiative had two positive unintended macro-institutional consequences. At the regional level, Chen's initiative triggered an avalanche of high-tech start-ups in the Zhongguancun area of Beijing. At the national level, Chen triggered China's National Torch Program.

In this essay, I examine the birth, growth, and demise of China's first entrepreneurial venture, Advanced Technology Service Division (ATSD), based in the Zhongguancun area of Beijing. Chunxian Chen created ATSD, earning public recognition as the first entrepreneur in China's information technology (IT) industry during the era of economic reform.

Chunxian Chen

Chunxian Chen was the first mover in China's IT industries in the 1980s. Before he started up his business, he was a researcher at the Chinese Academy of Sciences (CAS), the most prestigious research institute in

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URL: http://www.thebhc.org/publications/BEHonline/2008/tzeng.pdf.

China, where he earned a reputation as an avant-garde researcher who could think big. [1]

Chen was born in 1934. His father, a university professor with a Ph.D. in veterinary medicine from the United States, inspired Chen's interest in science and technology. By the time Chen was ready to enter university, Soviet Russia already had a tremendous influence on China's higher education system. In the early 1950s, more than half of China's university science and technology courses used Russian materials exclusively. By the late 1950s, some 12,400 Chinese translations of Russian works were widely circulated.[2] There had been a ban on British and U.S. textbooks since 1949.[3]

Upon the founding of the People's Republic of China in 1949, Mao Zedong declared that China would lean to the side of the Union of Soviet Socialist Republics (USSR). Communist China abandoned the nationalist government's education system and adopted that of Soviet Russia. In 1950, at the First National Conference on Higher Education, the Minister of Education, Ma Hsu-lun, argued that China "must not commit the same old mistake of knowledge for knowledge's sake, ignoring the needs of the people and the state." Instead, he said, "our higher education must tie in closely with the needs of economic, political, cultural, and defense constructions of our nation."[4]

To tie education to the national economic plan, the State Economic Commission assigned jobs to university graduates. For example, the commission sent 15,163 (24.3 percent) of China's class of 1956 graduates to Chinese universities to be instructors or graduate students, or to universities abroad to further their studies. The commission sent the vast majority of those studying abroad to Russia rather than to the United States, especially after the Korean War, the slogan for which was: "Resisting America, and Aiding Korea."[5]

1953: Chen's Studies in the USSR

Chen was among the many excellent students sent to Russia. In 1953, he entered the University of Moscow to study physics. This was the heyday of Russian research and development (R&D). The USSR launched Sputnik, the first satellite in human history, in 1957, the year Mao visited the Soviet Union. On November 17, he gave a talk to Chinese overseas students in the

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[1] Cong Cao, "Zhongguancun: China's Silicon Valley," *China Business Review* 28, no. 3 (2001): 38-41.

[2] Immanuel C. Y Hsu, "The Reorganisation of Higher Education in Communist China, 1949-61," *China Quarterly* 19 (July-Sept. 1964): 128-60.

[3] Ch'eng-chih Shih, *The Status of Science and Education in Communist China and a Comparison with That of USSR* (Kowloon, Hong Kong, 1962).

[4] Hsu, "The Reorganisation of Higher Education in Communist China," 136.

[5] Joanna Waley-Cohen, *The Sextants of Beijing: Global Currents in Chinese History* (New York, 1999).

auditorium of the University of Moscow. Chen sat in the third row, and heard Mao say: "The world is yours, and is also ours. But eventually it is yours. You, young people, are so energetic and vibrant. You are really like the sun in the early morning. We set our high hope on you."[6]

1958: Chen's Return to China

After Chen finished his degree in 1958, he returned to China, where the National Plan for Long-Range Development of Science and Technology (1956-1967) had just been launched. Under this plan, China intended to strengthen its science and technology capabilities with the assistance of the USSR.[7]

Chen began his research career at the Institute of Physics at the CAS in the Zhongguancun area. Zhongguancun covers 100 square kilometers in Beijing's Haidian district, which is located 15 kilometers northwest of Beijing's center, the Forbidden City. Haidian used to be home to imperial resorts, including Yuan Ming Yuan (founded in 1709), the Summer Palace (founded in 1750), and Fragrant Hill Park (founded in 1186).

At the time Chen returned to China, Zhongguancun was undergoing a dramatic change. Following the Soviet model, the Chinese government intended to develop Zhongguancun as an area of higher-level education and research. In the early 1950s, Renmin University of China, Central University for Nationalities, and Beijing University of Technology were founded in the southern area of Zhongguancun. The renovation and expansion of Tsinghua University occurred in the northern area. Beijing University had just moved to the western area. Eight major universities were founded in the eastern area: Beijing Institute of Iron & Steel Technology; Beihang University; China University of Geosciences; China University of Mining and Technology; University of Petroleum, Beijing; Beijing Forestry University; Beijing Institute of Agriculture and Engineering and Chemistry; and Beijing College of Medicine. In 1953, CAS's institutes of Geography, Physics, Mathematics, Semiconductors, Mechanics, and Chemistry also moved to the Zhongguancun area.[8]

After Chen's return to the CAS in 1959, he researched polymer semiconductors and helped establish a polymer laboratory. During the period from 1963 to 1965, Chen organized a cross-laboratory team to undertake research on high-energy lasers. After he completed the high-energy laser research in 1965, Chen helped found the Institute of Technical Physics, where he conducted research on the physics of nuclear

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[6] Xiaoyu Sun, "Chunxian Chen Has Been Struggling for All His Life," *China Computer World*, (24 Aug. 2004), accessed 26 Aug. 2008, http://www.ccw.com.cn/work2/corp/jingli/htm2004/20040824_13SRI.htm.

[7] Richard P. Suttmeier, *Research and Revolution; Science Policy and Societal Change in China* (Lexington, Mass., 1974).

[8] Victor F. S. Sit, "Social Areas in Beijing," *Geografiska Annaler* 81, no. 4 (1999): 203-21.

fusion. In the late 1960s, inspired by the Soviet Union's successful construction of a Tokamak reactor, a doughnut-shaped chamber used in nuclear fusion research, Chen started to build one similar to the USSR model.

Unfortunately, in 1966, while Chen's research was underway, Mao launched the Cultural Revolution, which took "on a distinctly anti-scientific tone."[9] Political struggle replaced research. Of the 9,279 researchers and staff members, the government inhumanely interrogated 881, and labeled 102 of them as "bourgeois, reactionary academic authorities," enemies of the working class.[10]

Mao claimed that intellectuals were "stingy ninth-rankers," the lowest rank of Chinese society, and he sent most of the scientists at the CAS to the countryside to perform hard labor. In addition, 1,811 CAS researchers worked in factories and rural villages and 190 researchers in thirty-three junior high schools and eight elementary schools. Fortunately, Chen, though regarded as revisionist during the Cultural Revolution, was not a main target, thanks to his close connection to the USSR at that time. Chen continued his work during the turmoil. During the period from 1972 to 1974, he led a team that successfully constructed China's first Tokamak reactor, the CT-6. In addition to science and technology research, Chen was also an administrator. In 1974, he became the vice-director of CAS's Anhui Institute of Optics and Fine Mechanics, located in the Chinese interior.

Around the time of the founding of Anhui Institute of Optics and Fine Mechanics, the Cultural Revolution ended. Deng Xiaoping's return to power in 1977 halted Mao's Cultural Revolution and ushered in the Spring of Science. Deng held the first National Science Congress on March 18, 1978, attended by the 5,586 scientists who had survived the Cultural Revolution.[11]

Unlike Mao Zedong, Deng respected the intellectual. At the Congress, he declared that intellectuals, especially scientists and engineers, were to be "full members of the working class."[12] With Deng's leadership, the view of the intellectual as the enemy of the working class began to melt away. He also emphasized the importance of science and technology to economic development, referring to them as "the first productive force." Deng's administration managed to spend 1.5 percent, 1.6 percent, and 1.5 percent

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[9] Yuan-Li Wu, and Robert B. Sheeks, *The Organization and Support of Scientific Research and Development in Mainland China* (New York, 1970), 462.

[10] Cong Cao, "The Changing Dynamic between Science and Politics: Evolution of the Highest Academic Honor in China, 1949-1998," *Isis* 90 (June 1999): 298-324, quotation at p. 313.

[11] H. Lyman Miller, *Science and Dissent in Post-Mao China: The Politics of Knowledge* (Seattle, Wash., 1996).

[12] Richard P. Suttmeier, "Reform, Modernization, and the Changing Constitution of Science in China," *Asian Survey* 29 (Oct. 1989): 999-1015, quotation at p. 1004.

of China's GNP (Gross National Product) on R&D in 1978, 1979, and 1980, respectively.[13]

At the first National Science Congress Chen was awarded the inaugural National Scientific and Technological Advance Award for his contribution to China's first Tokamak reactor. Then 44 years old, Chen also received a promotion to full professor, the youngest professor in China qualified to supervise doctoral students and to be a director of the nuclear fusion laboratory.[14]

In 1978, soon after the National Science Congress, China held the Third Plenum of the Eleventh Chinese Communist Party Congress. In his speech at the Third Plenum, the pragmatist Deng first replaced ideologist Mao Zedong's class struggle with economic development: "more attention had to be given immediately to improving the general population's livelihood. People had suffered too much."[15] Deng also announced that China was about to implement a series of "Four Modernizations," in industry, agriculture, science and technology, and national defense/military.

As for economic development, Deng acknowledged the failure of socialism in Mao Zedong's era: "The socialist system was too tight and needed to be loosened. Excess planning had made the economy lifeless and destroyed motivation." He lamented, "China had gone too far in copying socialism from the Soviet Union and needed to move away from that path." Therefore, the mechanism of the market had to be reintroduced into China. "Markets had to be revived and allowed to flourish in order to enliven production and satisfy people's needs."[16] In addition, Deng's approach to reconciling the tension between planning and the market recognized the former as principal and the latter as supplementary.

As for international relations and the Chinese state's role as an autarky in the world economy, Deng discontinued Mao Zedong's policy of self-reliance. Deng argued that "China needed to expand its contacts with foreign countries" in order to "take advantage of increased commerce with other countries to learn from their technology and their experience."[17]

1978: Chen's Visit to the United States

Chen, along with ten fellow CAS scientists, took academic tours to the United States soon after the establishment of the Open Door Policy in 1978. They visited "more than twenty cities in fourteen days" with "two American

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[13] Shulin Gu, *A Review of Reform Policy for the S&T System in China: From Paid Transactions for Technology to Organizational Restructuring* (Maastricht, Netherlands, 1995), 10.

[14] Institute of Modern Physics, Chinese Academy of Sciences, *Obituary: Chunxian Chen* (Beijing, 2004).

[15] Ezra F. Vogel, O*ne Step Ahead in China: Guangdong under Reform* (Cambridge, Mass., 1995), 41.

[16] Ibid.

[17] Ibid.

bodyguards."[18] During this academic visit, Chen presented details of his experiments on the CT-6 at Princeton University.

At that point, the United States, rather than the USSR, was the destination of choice for Chen's academic pilgrimages. After Stalin died in 1953, the gradual straining of China's relationship with the USSR led to an eventual split in the 1960s. In contrast, U.S. president Richard M. Nixon's trip to Beijing in 1972 began the normalization of Chinese-American relations.

After his academic tour, Chen summarized his U.S. visits in a paper entitled "The Diffusion of Technology and New Emerging Industries," which he presented at the conference of the Beijing Plasma Association on October 23, 1980. The American accomplishments that he found to be most impressive were Route 128 and Silicon Valley. Of Route 128, Chen said:

> We visited a small factory that manufactured superconductive magnets. This was a very inspirational and encouraging visit. The founder of this factory used to be a professor at Boston University. He told us that professors contributed knowledge and ideas, and other people contributed capital. And they worked it together to start up a company. They had produced many series of advanced superconductive magnets that were used in laboratories of high-energy physics and nuclear-fusion physics. . . . The more contracts they had, the more people they hired. Normally they had twenty people working in that factory.[19]

In China, Chen lamented, "the factories that manufactured superconductive materials had more than a thousand employees; however, the products they produced were really bad." Comparing the United States to the USSR, Chen said:

> Though the Soviet Union launched a satellite and Tokamak reactor earlier than the United States, the United States caught up by the advantage of experiments and equipment. The reason why the United States could catch up so rapidly was that the United States had a much faster process of transforming technology into products in the markets. Scientists and engineers in the United States had very strong entrepreneurship. They always rushed to transform their inventions, technologies into products. And as for this phenomenon, we cannot ignore the incentive of profits in the United States capitalism . . . and the entrepreneurs' self-satisfaction of starting up a business.[20]

Chen then compared the United States to China. He said, "We have been working here in Zhongguancun for more than twenty years. We know

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[18] Chunxian Chen, Beijing, interview with author, 2003.
[19] Chunxian Chen, "The Diffusion of Technology and New Emerging Industries," paper presented to the Beijing Plasma Association Conference, 23 Oct. 1980; the author obtained a copy of this paper from Chen in Beijing, 2003.
[20] Ibid.

that the density of professional talents here is no less than the areas of Boston and Silicon Valley. I think there is a huge potential in Zhongguancun that we have not been able to capitalize on."[21]

Zhongguancun underwent a dramatic change in the 1950s, and by the end of 1960, it had a reputation as a center of higher education in China.[22] In the following decades, higher education and research institutes in Zhongguancun contributed significantly to China's atomic bomb (1964), hydrogen bomb (1967), and satellite (1967) development.[23] However, those impressive defense-related technological achievements had little, if any, influence on economic development in Zhongguancun. As Robert Suttmeier pointed out, "because of intense secrecy, there was little chance that the technical progress made in defense work would find its way into the civilian economy." Furthermore, "the institutional settings . . . were biased against close and effective connections with production."[24]

At the Plasma Association conference, the audience just sniffed at Chen's passionate talk. In the early 1980s after the Open Door Policy, few in China had heard of Silicon Valley. The vast majority, if not all, of the researchers regarded "samples, exhibits and presentations" as the ultimate goals of their research.[25] To work in industry had been "a sign of a failed career." [26] The idea of commercializing research never occurred to them.

1980-1986: The Early Years of Chen's Start-up

Despite the audience's skepticism, Chen "walked his talk" in 1980. He ventured to capitalize on the potential of Zhongguancun by his entrepreneurship. This marked a critical point in the modern history of China's science and technology. Following his instinct, he started up the ATSD, a technology-consulting firm in the Zhongguancun area of Beijing. He felt that he "wanted to do something that he dared not do before." This start-up emancipated his spirit, which "was repressed in the Cultural Revolution."[27]

It was the first time that communist China had an entrepreneurial initiative in the market. According to Adam Segal, ATSD was "an organization many considered the first nongovernmental enterprise" in

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[21] Ibid.

[22] Piper Gaubatz, "Changing Beijing," *Geographical Review* 85 (Jan. 1995): 79-96.

[23] John W. Lewis and Litai Xue, *China Builds the Bomb* (Stanford, Calif., 1988).

[24] Suttmeier, "Reform, Modernization, and the Changing Constitution of Science in China," 999-1015, quotation at p. 1009.

[25] "Let the Running Water Flow More Quickly to the Fertile Land," *Gaungming Ribao*, 1985.

[26] Suttmeier, "Reform, Modernization, and the Changing Constitution of Science in China," 1009.

[27] Chunxian Chen, Beijing, interview with author, 2003.

China.[28] Firms in the socialist Chinese society were quite different from their counterparts in the capitalist United States. Created according to the national economic plan, Chinese firms were part of an administrative framework and operated according to government authority.[29]

Chen's start-up was not a state-owned enterprise (SOE), and therefore the state did not have administrative control over it. Chen operated his start-up based on four "self" principles: self-financing, self-chosen partnership, self-operation, and self-responsibility for gains and losses.[30] With respect to self-financing, Chen borrowed his initial capital of RMB 200 ($25) from his colleagues. As for the self-chosen partnership, Chen began by recruiting fourteen researchers. Together they provided technological consulting to firms in Beijing, while they retained their original positions at the CAS. With the ebb and flow of Chen's consulting business, the number of staff rose to twenty or thirty, and then fell to six or seven.

Concerning self-operation, Chen had to identify clients himself because, under the regulations of the national economic plan, they could not contact Chen. By October 1981, Chen and his colleagues had undertaken seven R&D projects from government, provided technology consulting services to another three government departments, and helped to build an electronics factory. As for self-responsibility for gains and losses, Chen had discretion over distributing the profits in 1982. The first year's revenue was more than RMB 20,000 ($2,500) and every staff member received RMB 10 ($1.25) per month, in addition to his or her original salary, effectively doubling each person's salary.

Chen's measures drew criticism from conservatives. The director of the Physics Institute, Wei-Yan Guan, criticized Chen and his colleagues as iconoclasts. In Guan's opinion, they were not engaging in their approved business; furthermore, they were corrupting the mentality of their comrades at the CAS. Regarded as heterodox, Chen found his career in peril.[31] Wei-Yan Guan investigated Chen's ATSD four times.[32] Chen, however, did not consider Guan's measures valid:

> We suffered a bad reputation. Guan said we were corrupting the staff mentality. However, many of my staff thought, to work here is to serve our nation, to do good to our nation. They could not imagine that they were blamed for their initiatives. As a result, they

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[28] Adam Segal, *Digital Dragon: High-Technology Enterprises in China* (Ithaca, N.Y., 2003), 56.

[29] Shulin Gu, *China's Industrial Technology: Market Reform and Organizational Change* (London, 1999).

[30] Chunxian Chen, Beijing, interview with author, 2003.

[31] Ibid.

[32] *The Dream of Silicon Valley: Commemorating Chunxian Chen's Speech of the Diffusion of Technology and New Emerging Industries on 23 October 1980*. Chunxian Chen Memorial Office, Beijing, 2004.

> quit. Though we were very poor at that time, we did not need that extra 10 RMB monthly salary. I think what I was doing was right; therefore, I did not need to correct my behavior.[33]

In 1983, Chen survived Guan's criticism, thanks to Xinhua News Agency's internal reference source, the *Neibu Cankao*. Only the most senior and experienced journalists had the privilege of writing for the *Neibu Cankao*, which normally covered controversial issues in society.[34] *Neibu Cankao* was a 3-10–page report circulated exclusively among officials at the ministerial level and higher. The internal report of Chen's case read as follows:

> Advanced Technology Service Division has signed twenty-seven contracts with related units and it has accomplished half of them. It also provided technology consulting services to four collective-owned factories in Beijing's Haidian District to help them develop and implement new products; it also helped the Haidian District to construct an area of technology experimentation and to build three technology consulting organizations.[35]

After reading this positive report, officials at various levels of the government began to urge the state to support Chen in his efforts. First, Yi Fang, then director of the National Science Committee and former director of the CAS, noted on January 7, 1983: "What Comrade Chen has accomplished is absolutely right. He should be encouraged."[36] Then on January 8, 1983, Qi-Li Hu, the director of the Central Office of the Chinese Communist Party (CCP), also expressed his opinion, supporting Chen publicly:

> Comrade Chen pioneered and created a new era. He might create a new path of transforming the research result into a direct force of production. In addition to that, he also created a new avenue. By this avenue, technology staffs could contribute to the four modernizations in China. We should allow those technology staffs to become rich and allow them to break the iron bowl mentalities. For sure, we need to work on the relevant regulations and policies. The Beijing Association of Science and Technology shall support it.[37]

Eventually, the internal report reached the highest-ranking official, Yao-Bang Hu, then the general secretary of the Central Committee, who stated on January 8, 1983: "The Science and Technology Leadership Team should create some guidelines and policies to support Comrade Chen."[38]

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[33] Ren Liu, *Chunxian Chen: The Pioneer* (Beijing, 2004).
[34] Todd Hazelbarth, *The Chinese Media: More Autonomous and Diverse—Within Limits: An Intelligence Monograph* (Langley, Va., 1997).
[35] Comments of high-ranking Chinese officials are from a manuscript obtained from Chunxian Chen in Beijing, 2003.
[36] Ibid.
[37] Ibid.
[38] Ibid.

Dong-Wan Zhao, the vice-director of the Science and Technology Leadership Team, replied on January 13, 1983: "Following the directions of comrades Yao-Bang Hu and Qi-Li Hu, when we are formulating policies and systems regarding science and technology, we shall incorporate the opinions of comrade Chunxian Chen."[39]

These supportive words from high-ranking officials endowed Chen's venture with legitimacy. In turn, Chen's activity inspired many other techno-entrepreneurs in Zhongguancun. Many scientists and engineers followed Chen and jumped into the sea of business (*xia hai*). The nongovernmental high-tech start-ups in Beijing's Zhongguancun area in 1983, 1984, 1985, and 1986 were about 10, 40, 90, and 100, respectively.[40]

As the number of start-ups multiplied, "Electronics Street" emerged in the Zhongguancun area. In response, the National Science and Technology Committee, the CAS, the Ministry of Education, the Beijing municipal government, and the Haidian district government joined forces to establish the Zhongguancun Planning and Development Office in 1984.[41] In order to protect these burgeoning high-technology start-ups, in early 1985 the Chinese government announced that it would begin to restrict the import of some electronics components.[42]

In June 1986, the Beijing municipal government commissioned Beijing University of Technology and Renmin University of China to survey the enterprises located in Electronics Street in Zhongguancun. This survey concluded that Electronics Street was a "scientific and technological productive force that cannot be ignored." It "represents a positive form of operation that combines technology and economy."[43]

Following this survey, in October 1986, the Beijing municipal government promulgated its Regulations Regarding Collective-Owned and Privately Owned High-Technology Enterprises in Beijing City, which stated: "Collective-owned and privately owned high-technology enterprises are newborn things in the reform of scientific and technological institutions. Every district governmental unit should give them guidance, management, and assistance in order to assist them in the development of high-tech business."[44]

In addition to the assistance from the state, Zhongguancun start-ups also decided to help each other. In early 1987, they established the China Non-Governmental Science and Technology Entrepreneurs Association.

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[39] Zhongguancun Management Committee, "The Official History of Zhongguancun."
[40] Ibid.
[41] Ibid.
[42] Denis Fred Simon, "China's Drive to Close the Technological Gap: S&T Reform and the Imperative to Catch Up," *China Quarterly* 119 (Oct. 1989): 598-630.
[43] Zhongguancun Management Committee, "The Official History of Zhongguancun."
[44] Ibid.

The People's Daily enthusiastically reported the burgeoning Zhongguancun in an article entitled: "A Change in Beijing's Quiet Zhongguancun: A Silicon Valley of China Is in the Making."[45]

This was the first time that China had such a large number of entrepreneurial start-ups. The juridical framework of socialist China might regard many of the business activities of these private start-ups as illicit, if not illegal. Although some higher-ranking officials had voiced their support for those such as Chen Chunxian who started entrepreneurial enterprises, some conservative comrades disparaged "Electronics Street" as "Crook Street." Worse yet, others regarded Zhongguancun as the seedbed of evil capitalism. Before long, the cluster of entrepreneurial start-ups in the Zhongguancun area began to draw the full attention of China's central authorities.

The Launch of the National Torch Program

A journalist at Xinhua News Agency wrote *Neibu Cankao* regarding Electronics Street in Zhongguancun. On December 7, 1987, after reading this *Neibu Cankao*, Zhao Ziyang, then general secretary of the Communist Party of China, forwarded it to both Rui Xingwen, then secretary of the CCP Secretariat of the Central Committee, and Wen Jiabao, then director of the General Office of the CPC Central Committee. On December 8, 1987, Rui Xingwen commented on this report: "Comrade Jiabao please read it too. I would like to understand Zhongguancun. Could we conduct an in-depth survey?" On December 9, Wen Jiabao commented: "I have ordered the Research Office under the General Office of the CPC Central Committee to conduct research on Zhongguancun."[46]

On December 28, 1987, under Wen's direction, the Chinese Central Government conducted a study to determine the feasibility of turning Zhongguancun into a science-based industrial park. The collaborative efforts of seven organizations made the study possible: The Committee of National Education (now the Ministry of Education), the CAS, the Chinese Science Association, the Beijing Association of Science, the Haidian district government, and the Research Office under the General Office of the CPC Central Committee.[47]

On January 3, 1988, Wen Jiabao visited Zhongguancun and held meetings with Chen and other techno-entrepreneurs. On January 15, Rui Xingwen also held conferences to discuss the relevant policies regarding

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[45] Gordon White, *Riding the Tiger: The Politics of Economic Reform in Post-Mao China* (Stanford, Calif., 1993).

[46] Zhongguancun Management Committee, "The Official History of Zhongguancun."

[47] G. Wu, L. Yan, and T. Wang, "Beijing Regional Innovation System: History, Dilemma and Solution," paper presented to the Second Globelics Conference, Innovation Systems and Development: Emerging Opportunities and Challenges, Beijing, China, Oct. 2004.

the start-ups in Zhongguancun. Fourteen institutions attended the conferences: the National Science and Technology Committee; the National Education Committee; the Ministry of Electronic Industry; the Ministry of Foreign Trade and Economic Cooperation; the Ministry of Personnel; the State Administration for Industry and Commerce; the Industrial and Commercial Bank of China; the State Administration of Taxation; the Bank of China; the Agricultural Bank of China; the China Association for Science and Technology; the CAS; the Beijing Science and Technology Committee; and the Haidian district government.

After all the site visits, meetings, and conferences, the final product of the study on Zhongguancun was a 20,000-word report. After reading it, Premier Minister Zhao Ziyang released the directive to “construct the Zhongguancun as a science-based industrial park.” At the local level, in May 1988, the Beijing municipal government issued *The Temporary Regulations Regarding the Beijing Experimental Zone for the Development for New Technology Industries*. The State Council approved the establishment of Haidian district as an experimental zone for the development of high (and new) technology. The regulations provided indigenous firms with preferential policies. At the national level, on April 12, 1988, the first session of the Seventh National People’s Congress passed an amendment to the 1982 constitution. It legitimized “private enterprises” (*sinying qiye*).[48]

Of the policies aimed at fostering entrepreneurial venturing, the most influential one was the National Torch Project carried out by the State Science and Technology Commission in 1988. Its purpose was to construct science and technology industry parks nationwide to foster entrepreneurial start-ups. The state hoped that by building science parks, the R&D institutes, universities, and start-ups could work closely together.

Science park authorities needed to recognize new start-ups so that they could be located in high-technology industry parks. To be classified as new-technology enterprises, firms had to meet several criteria.[49] The technology underpinning the activities of the enterprise should be in areas of “new and high” technologies specified by the State Science and Technology Commission. The enterprises should have a required amount of disposable capital and physical resources, market potential, and acceptable organizational and managerial capabilities. Finally, the chief manager should be a scientific or technical professional.

The National Torch Program triggered a wave of entrepreneurship in Zhongguancun. Entrepreneurs there now tried to “turn their capital into stocks,” to “build their industries into scale economic entities,” to “renovate

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[48] Xiaomin Wang, *Zhongguancun Science Park: A SWOT Analysis* (Singapore, 2000).

[49] State Science and Technology Commission, *Collection of Policy Documents on the Reform of Science and Technology Management System in China, 1985-1990* (Beijing, 1991), 563-66.

their technology," to "pool funds from various sources," and to "scientifically manage their enterprises."[50]

This wave of entrepreneurship also brought two elite universities to Zhongguancun. In 1993, Beijing University launched its own Founder Group Co. After launching its flagship product, a professional color publishing system in 1994, it went public on the Hong Kong stock market in 1995. It raised capital of $0.36 million. Tsinghua University founded its Tsinghua Unisplendour Group in 1993. It developed the first domestic-made color laser photocomposition system. In 1999, Tsinghua Unisplendour Group went public on the Shenzhen stock exchange. In this wave of entrepreneurship, eleven firms located in Zhongguancun had gone public by 2000.[51]

1990s: The End of Chen's Start-up

The officials' supportive words in 1983 endowed Chen's venture with legitimacy. Soon after, in April 1983, Chen expanded his business into the Beijing Hua-Xia New Technology Research Institute with assistance from the Beijing Association of Science and Technology and the Science and Technology Committee and the Industrial Corporation of Haidian district.[52]

In the same year, the Beijing Hua-Xia New Technology Research Institute developed a printing system called 888 to print all the documents used in the World Congress of the International Advertising Association held in the People's Congress Hall in Beijing. Chen did not continue to promote the 888 printer system, however, because he did not have the financial resources to keep developing it. As a result, Chen lagged behind competitors in delivering the latest printing technology.[53]

Later, the Beijing Hua-Xia New Technology Research Institute also helped corporations in the United States convert texts into digital data, charging $4 per 10,000 words. At the height of the business, Chen hired more than a hundred operators; annual revenue was $100,000. Based on this financial performance, Chen expanded his business investments into five other cities, including Shenzhen, Tianjin, Chengdu, Kunming, and Hong Kong. However, Chen was aware that the text-digitization business did not have high added value.[54]

In 1987, Chen decided to enter the computer business. In addition to all the capital he had accumulated, he borrowed RMB 1.6 million ($200,000)

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[50] The Administration Commission of Zhongguancun Science Park, *The History of Development of Zhongguancun Science & Technology Park* (Beijing, 2000, 2001).
[51] Mingjuan Hou, "Legend Sets up Joint Laboratory" *China Daily*, 26 March 2000, page 5.
[52] Zhongguancun Management Committee, "The Official History of Zhongguancun."
[53] Liu, *Chunxian Chen: The Pioneer*.
[54] Ibid.

to invest in the business of mainframe computers.[55] By then, his commitment to business had escalated, and he decided to resign his position at the CAS. However, by the time Chen acquired those mainframe computers, the trend had shifted from mainframe to personal computers.[56] Chen misjudged the development of the computer industry, but by the time he realized that, it was too late to change his strategy because of the high cost of the mainframe computers.[57]

In 1990, a RMB 3.2 million ($400,000) contract boosted Chen's morale. The Department of Material Supply at the CAS commissioned Chen to build a computer logistic system. However, Chen and the Department of Material Supply had a conflict over this contract. Chen successfully argued his case before both the Administration for Industry and Commerce of Haidian district and the Beijing Intermediate People's Court. Unfortunately, on November 12, 1990, Chen lost his case in the Beijing Supreme People's Court, on the grounds that "Beijing Hua-Xia New Technology Research Institute engages in business beyond the registered sphere of operation."[58]

Meanwhile, China and the United States entered into a comprehensive trade agreement by signing a Memorandum of Understanding (MOU) in 1992. Under the MOU, China agreed to lower import tariffs on many high-tech products significantly, reducing the tariff rate from 35 percent to 15 percent. China also agreed to remove quotas and licenses on a wide range of American computer-related products exported to China.[59]

As a result, one year after the 1992 MOU, there were 250,000 personal computers sold in China, up from 85,000 in 1990. Foreign computers accounted for more than 67 percent of the 1993 sales of 450,000 personal computers in China, up from 58 percent in 1991. In 1997, the number of computers sold in China soared to 3.03 million. China became the world's sixth largest personal computer market, after the United States, Japan, Germany, Britain, and France.

In 1993, faced with strong domestic and foreign competitors in the electronics and computer industry and lacking strong technological capabilities, Chen completely abandoned the computer business and ventured into the voice beeper business. He thought this might be a profitable project because voice beepers cost 60 percent less than Mandarin-character beepers. Chen invested RMB 2 million ($250,000) in

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[55] Sun, "Chunxian Chen Has Been Struggling for All His Life."
[56] Ren Liu, "Chunxian Chen: The First Mover of Private Hi-Tech Start-Ups," *Economic Review* (14-20 July 2003).
[57] Sun, "Chunxian Chen Has Been Struggling for All His Life."
[58] Zhongguancun Management Committee, "The Official History of Zhongguancun."
[59] Michael G. Rukstad, Henry Chen, Harry Qin, Greg Ye, and Zheng Yin, *A Technology Legend in China* (Boston, Mass., 2001), Harvard Business School Case # 701052.

developing the voice beeper. However, as more competitors entered the electronic gadgets market, Chen's voice beeper business was unsuccessful. Chen went bankrupt in 1996, resulting in the disbanding of the Beijing Hua-Xia New Technology Research Institute.[60]

The Development of Zhongguancun after the Demise of Chen's Business

The development of the Zhongguancun area started with Chen's entrepreneurial ventures; however, it did not stop with the demise of Chen's business. Thanks to the burgeoning development of nongovernmental high-technology entrepreneurial firms, Zhongguancun started to attract Chinese returnees and multinationals from abroad.

In 1997, the Municipal Administrative Committee of the Experimental Zone was founded. One of its main tasks was to attract overseas Chinese professionals back home. In the twenty-five years following the Cultural Revolution, nearly 600,000 students left China, and only 160,000 returned.[61] The vast majority of overseas Chinese professionals opted not to come back because Chinese working conditions were not very encouraging.

Those who did come back faced inferior conditions for experimentation and primitive equipment, insufficient materials, and a shortage of funding. One major press report included a statement that "not an insignificant portion of the returnees have not been able to make full use of their know-how. Denied opportunities to put their expertise to good use, some researchers have given up their specialties, changed careers, struck out on their own, or even have gone overseas."[62] In summary, returning students felt stifled.

To turn around the discouraging working conditions, the Municipal Administrative Committee of the Experimental Zone established several business incubators of more than 140,000 square meters for returned overseas experts.[63] These included the Overseas Students Pioneer Park, established in 1997. In 1998, the Beijing Municipal Science and Technology Commission, the National Torch Program, and Tsinghua University joined forces to create the Beijing Tsinghua Software Development Center, the first software incubator in Zhongguancun. By 2002, there were fifty-three incubators in Beijing, accommodating more than 1,150 start-ups.[64]

In addition to creating the business incubators, beginning in late 1998 the Municipal Administrative Committee of the Experimental Zone

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[60] Sun, "Chunxian Chen Has Been Struggling for All His Life."
[61] "On Their Way Back: Chinese Entrepreneurs," *The Economist* (8 Nov. 2003), 71.
[62] Denis Fred Simon and Merle Goldman, *Science and Technology in Post-Mao China* (Cambridge, Mass., 1989), 188.
[63] Liu Jie, "Back Home for Business," *China Daily*, 2 Jan 2003.
[64] Beijing Municipal Science and Technology Commission, 2003, The Fifteenth Anniversary Report of the National Torch Program, Beijing.

organized conferences attended by 58 enterprises and 113 financial institutions. These conferences resulted in grants to local entrepreneurs of RMB 40.1 million ($4.8 million) in loans. Beginning in 2000, in addition to state loans, the Administrative Committee introduced a system of stock options to provide a better incentive system for the returnees.[65]

According to statistics compiled by the Administrative Committee, by the end of 2002, there were 1,546 enterprises run by returnees. About 18,000 overseas Chinese experts returned; double the number of two years before. In total, they registered RMB 1.5 billion ($180 million) in capital.[66]

With the homecoming of overseas Chinese experts, the multinational high-tech firms came to Zhongguancun to set up their research centers.[67] Zhongguancun in particular and the Chinese market in general attracted them. According to World Bank researchers Carl J. Dahlman and Jean-Eric Aubert, the establishment of a high-tech Park in Zhongguancun was the main attraction for the multinationals.[68] Furthermore, according to F.M.R. Armbrecht, "the size of the market and the quality and quantity of its human resources are enormous, especially those related to technology." Their domestic markets also pushed the multinationals. In the West, especially in the United States, "working relationships between industry and either universities or . . . national laboratories continue to become more difficult."[69]

In 1994, Nortel joined forces with Beijing University of Posts and Telecommunications to set up an R&D center. In 1995, IBM (International Business Machines) opened its IBM China Laboratory in the hope that it could build a laboratory as strong as its research centers in Almaden (California), Yorktown (New York), Haifa (Israel), and Zurich (Switzerland). To support its IBM China Laboratory, IBM signed R&D agreements with preeminent universities, including Beijing University, Tsinghua University, Fudan University, and Shanghai Jiaotong University. In the same year, Motorola cooperated with Tsing Hua University to open its Asia Manufacturing Research Center. In that year, too, Microsoft built its R&D center. In three years, it rolled out more than 130 research products, which made Microsoft the largest software developer in China.[70]

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[65] Wang, *Zhongguancun Science Park: A SWOT Analysis*.

[66] Liu Jie, "Back Home for Business," *China Daily*, 2 Jan 2003.

[67] Cong Cao, "Zhongguancun and China's High-Tech Parks in Transition: 'Growing Pains' or 'Premature Senility'?" *Asian Survey* 44 (Sept./Oct. 2004): 647-68, quotation at p. 655.

[68] Carl J. Dahlman and Jean-Eric Aubert, *China and the Knowledge Economy: Seizing the 21st Century* (Washington, D.C., 2001).

[69] F. M. Ross Armbrecht, "WTO Entry, Government's Welcome Could Spur Foreign R&D in China," *Research Technology Management* 45 (Sept./Oct. 2002): 2-5, quotation at p. 3.

[70] Liu Jie, "Beijing: R&D Hub for Many," *China Daily*, 28 May 2000.

In 1997, Hewlett-Packard and the State Science and Technology Commission of China established a joint research center in Zhongguancun. They invested $2 million and hired about sixty Chinese scientists in the first two years. In 1998, Intel announced that it would invest $50 million in the following five years to build the Intel China Research Center.[71] In the same year, Fujitsu set up a research center in Beijing, which is its largest overseas research center.[72] In that year, too, Nokia opened its Nokia China R&D center.[73] Sun set up a Technology Development Center in Beijing. Cisco built a network technology laboratory in Beijing that was the company's third largest in the world and the largest in Asia.[74]

In 1999, Bell Labs announced the founding of its Bell Labs Asia-Pacific and China Headquarters in Beijing. In the same year, Mitsubishi invested RMB 100 million ($12.5 million) to establish its mobile communication research and development center in Beijing, and Ericsson and Beijing Science and Engineering University together established a digital communication research center.[75]

Chen's Legacy

When asked how he felt about the stark contrast between the prospering Zhongguancun and his unsuccessful business, Chen said, "As a science worker, and as a Chinese, I am pretty glad that Zhongguancun became more and more prosperous. I am quite glad that I paved the first stone of the development of Zhongguancun."[76]

Government regulations embody Chen's legacy. In 1998, Beijing municipal city released the "Regulations on Encouraging *Minying* (Nongovernmental) High-Tech Enterprises." The regulations included operating principles for *minying* high-tech enterprises led by technological entrepreneurs: self-chosen partnership, self-financing, self-operating, and self-responsibility for gains and losses. In addition, they enjoyed the same subsidy policies as the SOEs in with respect to loans, R&D, and taxation.

In 2000, China's government released the *Regulations on Zhongguancun Science Park*.[77] The introduction includes a statement that

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[71] Marco Di Capua, "Technology Innovation in China" paper presented to the Sixth ISODARCO Beijing Seminar on Arms Control, Shanghai, China, 1998.

[72]. "Fujitsu to Establish Large Research Center in Beijing," *Asiainfo Daily China News*, 28 Sept. 1998.

[73] "China: Nokia Increases Investment in China," *China Business Information Network*, 4 Nov. 1998.

[74] "China: Remarkable Achievements by Cisco Network Lab, Dallas," *Asiainfo Daily China News*, 14 Dec, 1998.

[75] "China: Ericsson and University to Build DCRC," *Asiainfo Daily China News*, 30 Nov. 1999.

[76] "The First Entrepreneur in Beijing Zhongguancun Passed By," *Beijing Evening Newspaper*, 9, Aug, 2004.

[77] Beijing Municipality, 2001, Regulations on Zhongguancun Science Park, Beijing.

"organizations and individuals in the Zhongguancun area could do anything that is not prohibited by the law, regulations and chapters." In Chapter 2, "On the Market and the Order of Competition": "when entrepreneurs register their start-up business in the Zhongguancun area, they will not be asked by a government administrative unit to specify their areas of operations." In Chapter 5, "Regulations on Governmental Behavior": "administrators are responsible for their faults and accountable for their actions regarding start-ups."

At the beginning of the twenty-first century, twenty years after Chen's pioneering venture, there were some 15,000 high-tech enterprises in Zhongguancun. The industries represented included electronic information, optical-mechanical-electrical integration, biological engineering, new medicines, new materials, energy-saving technologies, and environmentally friendly technologies. Stock exchanges in China or abroad listed sixty-one Zhongguancun companies. On average, Zhongguancun enterprises invest 3.9 percent of their revenue in R&D. The R&D in new products accounted for more than 50 percent of their profits. The total income of the enterprises located in the Zhongguancun areas was RMB 284 billion ($34.3 billion).[78]

According to a survey conducted by the Administrative Commission of the Zhongguancun Science Park, high-tech firms in the Zhongguancun area employed roughly 170,000 people with an average age of 28.8 years. The average ages of the middle management and top management were 31.5 and 36.6 years, respectively. The percentages of employees with bachelor's, master's, and doctoral degrees were 80, 8.4, and 1.03 percent, respectively.[79] There are reports that some engineers working in the high-technology indigenous firms in Zhongguancun have become millionaires.[80]

The *Wall Street Journal* regarded Zhongguancun as China's Silicon Valley.[81] *Newsweek* selected Zhongguancun, "the most frenetic neighborhood in Beijing, perhaps in all of China," to be one of "the World's New Culture Meccas."[82] *The Economist* likened the rapid growth of Zhongguancun to "the Renaissance in Europe or the Meiji Restoration in Japan."[83]

Jici Wang of Beijing University said of Chen: "One may well argue that there would be no Silicon Valley without Prof. Frederick Terman. In my opinion, there would be no Zhongguancun without Prof. Chunxian

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[78] Cao, " Zhongguancun and China's High-Tech Parks in Transition."
[79] The Administration Commission of Zhongguancun Science Park, *The History of Development of Zhongguancun Science & Technology Park*.
[80] "The Rich Born in Zhongguancun," *Asiainfo Daily China News,* 4 Feb. 2000.
[81] Karby Leggett, "Zhongguancun Science Park Is Beijing's Silicon Valley Wannabe," *Wall Street Journal* (25 Sept. 2000).
[82] "The World's New Culture Meccas," *Newsweek* (2 Sept. 2002), 52-68.
[83] "On Their Way Back: Chinese Entrepreneurs," 71.

Chen."[84] Chen passed away at the age of 70 on August 9, 2004, in Zhongguancun, Beijing.

Conclusion

Writing in the late 1980s, William Fischer argued, with respect to the influence of market forces on China's industrial innovation:

> There is little evidence, in fact, that market forces are actually influencing the process of technical decision making in Chinese enterprises. . . . [I]t appears that an enterprise's commitment to innovation is frequently more the result of the historical centrally controlled allocation of scientific and technical talent to the enterprise than the presence of market influences. In short, it is not at all obvious that market forces have yet had any major or lasting impact on the process of Chinese industrial innovation.[85]

Rather than a centrally planned government entity, Chen's effort was a typical entrepreneurial initiative. He undertook a "creative response" to the opportunities of economic reform in the early 1980s in China. Furthermore, on encountering criticism on his new venture, Chen demonstrated adequate "will power . . . to break down the resistance that the social environment offers to change."[86]

Though not necessarily engaging "the new commodity" and "the new technology," Chen's entrepreneurial venture did involve "the new type of organization" that had four innovative management styles in contrast to SOEs.[87] These styles included self-chosen partnership, self-operation, and self-responsibility for gains and losses, all of which were "something that is outside of the range of existing practice."[88] Eventually Chen's venture also brought about "creative destruction" to the operating context of China's IT industry, in that it destroyed the old regulations and created new ones.[89]

Upon starting up his business, what was the source of resistance to Chen's venture? How did he overcome this hurdle successfully? Why did Chen fail in the end? Three sectors influenced Chen's entrepreneurial venture, the first of its kind in China in the era of economic reform.

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[84] *The Dream of Silicon Valley*.

[85] William A. Fischer, "China's Industrial Innovation: The Influence of Market Forces," in *Science and Technology in Post-Mao China*, ed. Denis Fred Simon and Merle Goldman (Cambridge, Mass., 1989), 119-35, quotation at pp. 134-35.

[86] Joseph A. Schumpeter, "The Creative Response in Economic History," *Journal of Economic History* 7 (May 1947): 149-59, quotation at p. 157.

[87] Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy* (New York, 1942), 84.

[88] Schumpeter, "The Creative Response in Economic History," quotation at p. 150.

[89] Schumpeter, *Capitalism, Socialism, and Democracy*, 84.

Strained Relations with the Social Sector

As Chen initiated his entrepreneurial start-up, conflict between him and his supervisor emerged. Chen and his supervisor represented the archetypical entrepreneur and administrator, respectively. Chen was a techno-entrepreneur, someone who was "constantly attuned to environmental changes that may suggest a favorable chance"; in stark contrast, his supervisor typified the administrator who wants "to preserve resources and reacts defensively to possible threats to deplete them."[90] The conflict was never resolved, probably due to Chen's "unwillingness to submit to authority, an inability to work with it"; as a result, the CAS seemed to play little, if any, role in Chen's venture.[91]

Though first movers may have a head start when compared to followers, the competitiveness does not come from the action of "pioneering per se."[92] Instead, the crucial part of building up a competitive advantage in first movers lies in "the acquisition of the resources."[93] This allows first-movers to transform opportunities into long-term competitive advantages.[94]

Owing to his strained relationship with his affiliated unit, Chen did not receive financial support or technological capabilities from the CAS. Although Chen was the first mover in China's IT industry, as a result of his lack of financial resources, he was not able to preempt scarce assets, which Marvin Lieberman and David Montgomery cite as one of the sources of first-mover advantage.[95] Had Chen had more capital, he might have invested in plants and equipment to deter the entry of other entrepreneurs into industries. Moreover, because he did not receive technological capabilities from the CAS, Chen was unable to derive a first-mover advantage by progressing through the learning curves of new products or processes. As a result, Chen's first entrepreneurial venture provided only technological services that did not require intensive investment in technology, and it did not create entry barriers.

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[90] Howard H. Stevenson and David E. Gumpert, "The Heart of Entrepreneurship," *Harvard Business Review* 63 (March-April 1985): 85-94, quotation at p. 87.

[91] Arnold C. Cooper and William C. Dunkelberg, "Entrepreneurship and Paths to Business Ownership," *Strategic Management Journal* 7 (Jan./Feb. 1986): 53-68, quotation at p. 56.

[92] Marvin B. Lieberman and David B. Montgomery, "First-Mover Advantages," *Strategic Management Journal* 9 (Summer 1988): 41-58, quotation at p. 49.

[93] Richard P. Rumelt, "Theory, Strategy, and Entrepreneurship," in *The Competitive Challenge: Strategies for Industrial Innovation and Renewal*, ed. David J. Teece (Cambridge, Mass., 1987), 137-58, quotation at p. 152.

[94] Roger A. Kerin, P. Rajan Varadarajan, and Robert A. Peterson, "First-Mover Advantage: A Synthesis, Conceptual Framework, and Research Propositions," *Journal of Marketing* 56 (Oct. 1992): 33-52.

[95] Lieberman and Montgomery, "First-Mover Advantages."

Failure to Build a Stronghold in the Market

Lack of both technological knowledge and financial support contributed to Chen's failure to build a stronghold in the market. When the competition is trying to level the playing field by rapid imitation, firms should "seek to gain advantage by creating strongholds that exclude competitors from their turf." [96] However, because Chen's business was neither capital- nor technology-intensive, the entry barrier to his "turf" was low. After Chen's entrepreneurial venture gained legitimacy from China's central government, many other scientists and researchers joined start-ups in the Beijing Zhongguancun. As Michael Hannan and John Freeman have noted, when previously illegitimate business ventures become legitimate and familiar, then "attempts at creating copies of legitimated forms are common, and the success rate of such attempts is high."[97] After all, what made Chen's venture distinctive was his innovative way of operating business, and unfortunately, "no . . . protection exists for . . . business innovation."[98]

The State

The relationship between entrepreneur Chen and the Chinese government was more nuanced than suggested by the state-led development theories. Contrary to previous scholars, who delineate a unidirectional influence from the state on entrepreneurship, I draw on Anthony Giddens' structuration theory to illustrate the interaction between Chen's entrepreneurship and the Chinese government (see Figure 1).[99]

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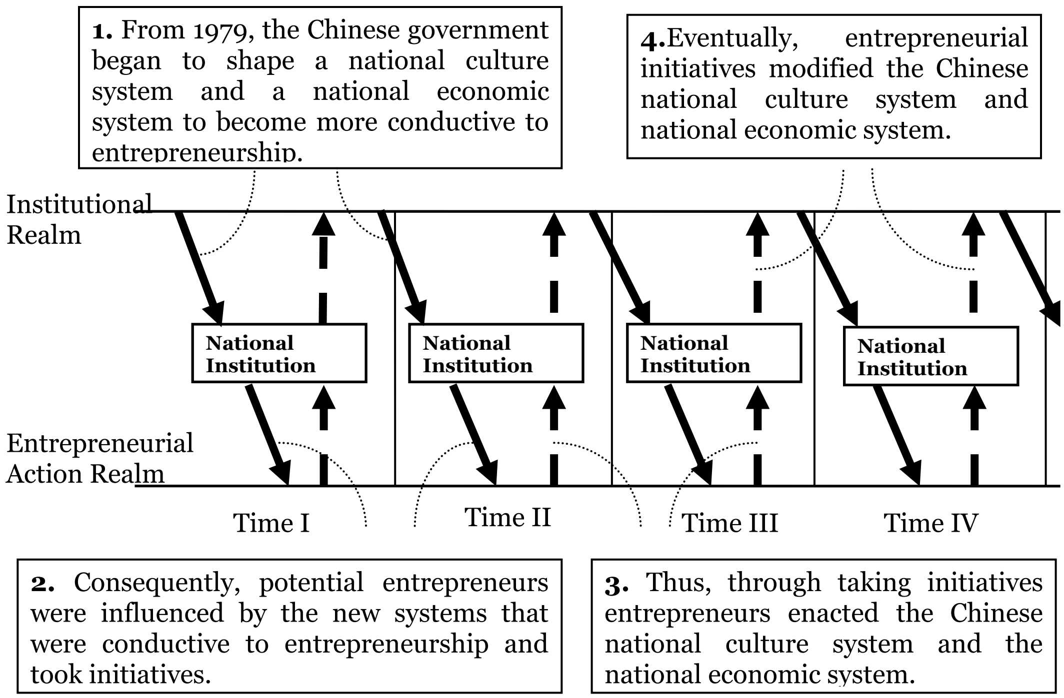
[96] Richard A. D'Aveni, *Hypercompetition: Managing the Dynamics of Strategic Maneuvering* (New York, 1994), 15.

[97] Michael T. Hannan and John Freeman, "Where Do Organizational Forms Come From?" *Sociological Forum* 1 (Winter 1986): 50-72, quotation at p. 63.

[98] Rumelt, "Theory, Strategy, and Entrepreneurship," quotation at p. 149.

[99] The relation between entrepreneurs and government in this study is akin to that between agent and structure in structuration theory. According to Giddens, "agents and structures are not two independently given sets of phenomena." Agents "are the same time the creators of the social systems, yet created by them," in *The Constitution of Society: Outline of the Theory of Structuration* (Cambridge, 1984: 204), whereas structure "is always both constraining and enabling" (25). Taken together, agents and structures represent a duality: "the structural properties of social systems are both medium and outcome of the practices" of the agents (25).

FIGURE 1
Interaction between Entrepreneurship and National Institution
in China since 1979



Note: Figure 1 was inspired by JoAnne Yates and Wanda J. Orlikowski, "Genres of Organizational Communication: A Structurational Approach to Studying Communication and Media," *Academy of Management Review* 17 (April 1992): 299-326.

Beginning in 1979, the Chinese government began to shape both national cultural and economic systems to be more conducive to entrepreneurship. When Deng regained power, he held the National Science Congress and the Third Plenum of the Eleventh Chinese Communist Party Congress in 1978. The former recognized the status of the intellectual in society, and the latter ushered in an era of economic reform. Though Deng did not aim to trigger entrepreneurship in the Chinese economy, these changes did encourage scientists and engineers working in the Zhongguancun area of Beijing to take the initiative.

Consequently, potential entrepreneurs, influenced by the new systems conducive to entrepreneurship, took initiatives. Encouraged by these systems, Chen wrote an article entitled "The Diffusion of Technology and New Emerging Industries" after visiting the United States in 1980. He maintained that the Zhongguancun area of Beijing could emulate the Silicon Valley and Route 128 regions of the United States. Soon after, Chen decided to act. He became the first scientist working in the Zhongguancun area of Beijing to start up a business.[100]

Thus, through taking initiatives, entrepreneurs enacted the Chinese national culture system and national economic system.[101] Though the Chinese government had been changing its systems, in the old social mentalities, profit-seeking was still a sin; thus, Chen enacted China's new national culture and economic system when he received a cascade of support from high-ranking officials after he encountered opposition from the CAS.

Eventually, entrepreneurial initiatives modified the Chinese national culture system and national economic system.[102] The legitimacy endowed on Chen's business ventures by high-ranking officials reinforced China's national cultural and economic system; and this in turn encouraged more scientists and engineers to plunge into business. As a result, there gradually emerged a cluster of start-ups in the Zhongguancun area of Beijing, which was formalized in the National Torch Program in 1988. Subsequently, Chen's business venturing modified the national economic system after the Chinese government had amended relevant regulation by incorporating the path-breaking features of Chen's business venturing into 1998's "Regulations on Encouraging Minying High-Tech Enterprises," and 2000's "Relations on Zhongguancun Science Park."

Chen's Entrepreneurial Venture: Failure or Success?

Per Davidsson once criticized conventional entrepreneurship researchers for discussing the success and failure of entrepreneurial ventures without considering the outcome of entrepreneurship at the societal level.[103] He categorized four kinds of entrepreneurial ventures (see Figure 2): success ventures (having positive outcomes on the societal and venture level), catalyst ventures (having a positive outcome on the societal level but negative outcome on the venture level), redistributive ventures (having a

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[100] Chen, "The Diffusion of Technology and New Emerging Industries."

[101] As JoAnne Yates noted, institutional "structures only exist as they are enacted by human agents"; see "Using Giddens' Structuration Theory to Inform Business History," *Business and Economic History* 26 (Fall 1997): 159-83, quotation at p. 160. Giddens also maintained, "the structural properties of social systems exist only in so far as forms of social conduct are reproduced chronically across time and space," see Giddens, *The Constitution of Society*, xxi.

[102] In Giddens' structuration theory, agent's "action . . . involves power in the sense of transformative capacity" (ibid., 15).

[103] Per Davidsson, "The Domain of Entrepreneurship Research: Some Suggestions," in *Cognitive Approaches to Entrepreneurship Research*, ed. Jerome A. Katz and Dean A. Shepherd (London, 2003), 315-72.

positive outcome on the venture level but negative outcome on the societal level), and failed ventures (having a negative outcome on both level).

FIGURE 2
Outcomes on Different Levels for New Ventures

Societal-Level Outcome

		Positive	**Negative**
Venture-Level Outcome	**Positive**	Success Ventures	Redistributive Ventures
	Negative	Catalyst Venture	Failed Ventures

Source: Per Davidsson, "The Domain of Entrepreneurship Research: Some Suggestions," in *Cognitive Approaches to Entrepreneurship Research*, ed. Jerome A. Katz and Dean A. Shepherd (London, 2003), 315-72.

Of these four sorts of ventures, the catalyst venture is of greatest interest to this study. Though not successful in themselves, they "inspire more profitable successors . . . [and] contribute to entrepreneurship as a societal phenomenon."[104] When entrepreneurial ventures in an industry fail at first, failing entrepreneurs often trigger the emergence of entirely new industries because other potential entrepreneurs learn and benefit from these failures.[105] This in turn, can lead to "higher subsequent growth rates and a reduction of unemployment" in the economy.[106] Thus, judging from the level of the firm, Chen's venture was a failure; however, if judged from the societal level, we could argue that Chen's venture was a success, because it stimulated the development of China's information industries,

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104 Ibid., 13-14.
105 Howard E. Aldrich and C. Marlene Fiol, "Fools Rush In? The Institutional Context of Industry Creation," *Academy of Management Review* 19 (Oct. 1994): 645-70.
106 David B. Audretsch, "Sustaining Innovation and Growth Public Policy Support for Entrepreneurship," *Industry and Innovation* 11 (Sept. 2004): 167-91, quotation at p. 180.

which emerged from the interaction between Chen’s entrepreneurship and China’s national institutions.