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Generational Change in Chinese ICT Entrepreneurs and their Business Models: A Review of A. Saxenian's Brain Circulation Model

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1. Rapid Growth of Chinese ICT Industry

When the Chinese government began its Reform and Opening Policy in 1978, Chinese GDP per capita was less than $400. In 1980, the number of telephone subscribers per 100 inhabitants in China was only 0.63, and in 1983 the development of machinery compatible with the IBM PC had only just started. Under a market-oriented and outward-looking policy, however, China achieved amazingly rapid and continuous economic development, so that its GDP per capita reached $3,678 in 2009.

China has already become one of the biggest ICT manufacturing countries in the world. In 2008, of the world's PCs, around 40%, or 136 million units, were made in China. As the PC factory of the world, China exported 80% of these, but 20% were sold to the Chinese market, which has also become one of the biggest markets in the world, around three times the size of the Japanese PC market. Lenovo, the top Chinese PC manufacturer, merged with IBM's PC Division in 2005 and became the world's third largest PC manufacturer (dropping to fourth, however, after the takeover of Gateway by Acer).

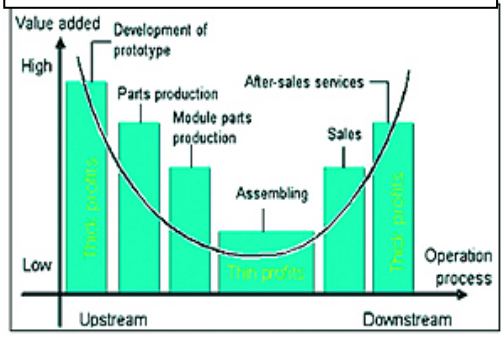
As of June 2010, China has 805.3 million mobile phone subscribers, or around 16% of the world's total and around eight times as many as Japan.

2. Factors in Rapid Growth of Chinese ICT Industry

(1) Global background

In 1981, IBM decided to enter the PC market and exchanged its previous closed strategy for an open strategy. To establish a PC standard, IBM adopted an open-spec strategy and sought to cultivate IBM-compatible manufacturers. The company outsourced the manufacture of its CPU and OS to Intel and Microsoft and used contract manufacturers in Taiwan. As a result, a worldwide division of PC production came into being. Under this division of production, countries with lower labor costs have been able to win a concentration of the assembly process and increase sales. As Stan Shih's smile curve theory illustrated, the added value in this process is less than that in the upstream and downstream processes.

Figure 1 Smile Curve



(2) New Chinese government policy

Until 1970, the Chinese government made much of independent computer development, but under the global conditions outlined above, it adopted a new policy. In 1983, it began a project aimed at developing machinery compatible with the IBM PC, and in 1985 it

adopted a new policy as part of the 7th five-year plan. The new policy emphasized the utilization of mainframe computers and the production of PCs and peripheral products.

As for telecommunications, the Chinese government introduced a competitive policy in 1993 to replace the state-monopoly system. The resulting competition between China Telecom, the previous monopoly carrier and China Unicom, a newly set-up carrier, promoted rapid increase in the number of mobile phone subscribers.

(3) Market-oriented business strategy

Under the business and political circumstances outlined above, major PC manufacturers such as LENOVO adopted a market-oriented business strategy based on the so-called Wintel technology. This market-oriented business strategy contributed to the rapid growth of the PC industry in China.

(4) Transfer to China of Taiwanese contract manufacturers' production base

Taiwanese contract manufacturers (Quanta, Inventec, Copel, Wistron, and so on) transferred their production base to China to save labor costs under the Chinese government's deregulation of Taiwanese investment in China.

(5) Increase in highly skilled human resources, emergence of ICT entrepreneurs, and role of overseas returnees

In 1979, China reintroduced a common university entrance examination and, as economic development progressed, the rate of university entrance rose rapidly (now more than 20%). This increase provided highly skilled human resources to the ICT industry. Moreover, many highly skilled individuals set up their own company and acted as entrepreneurs as defined by Schumpeter.

In the 1990s, a number of highly skilled individuals who had traveled overseas for education or career reasons started to return to China because they recognized business opportunities in their motherland. These returnees brought back to China advanced technology and, what was even more essential for the Chinese ICT industry, an advanced business model. This presentation focuses on the latter factor, especially with reference to the role of overseas returnees.

Table 1　Rate of return to China of students studying overseas

Year	Cumulative number of students studying overseas (10 thousands)	Cumulative number of returnees (10 thousands)	Rate of return (%)
1996	27.0	8.9	32.9
1997	29.6	9.6	32.4
1998	30.2	9.9	32.7
1999	32.0	11.2	35.0
2000	34.0	13.0	38.2
2001	46.0	13.5	29.3
2002	58.5	15.3	26.2
2003	70.0	17.8	25.4
2004	81.4	19.8	24.3
2005	93.3	23.3	24.9
2006	106.7	27.5	25.8

Source: Wang [2007] p.7

3. A. Saxenian's "Brain Circulation" Model

In *Regional Advantage*, published in 1994, AnnaLee Saxenian analyzed the reason why Silicon Valley succeeded but the R128 area, which flourished as an ICT center until the 1990s, failed. She concluded that the flexible network of Silicon Valley played the key role in its rapid growth in good times and its recovery from bad times. Afterward, Saxenian extended her model worldwide and focused attention on the new phenomenon of the global movement of highly skilled human resources, which consists of a return to the motherland of the highly skilled individuals who had come to the US, and above all Silicon Valley, in the so-called "brain drain". Saxenian called this new movement "brain circulation" and asserted that this brain circulation had contributed to the development of the ICT industry in Taiwan and India. In 2006, Saxenian published the *New Argonauts*, which was based on the "brain circulation" model and at the same time asserted that the connection between Silicon Valley and Hsinchu, the ICT center of Taiwan, had already extended to Shanghai in China.

The question of whether this brain circulation model is applicable to the Chinese ICT industry is the main subject of the present research paper.

4. Research Method

Nakagawa [2001], [2008], [2009], [2010a], [2010b], [2010c], [2010d] used a method consisting of three types resulting in nine cells; that is: Chinese ICT entrepreneurs were divided into three generations and three types: domestic careerists, returnees and foreigners (including Taiwanese). Moreover, according to career path and stock holdings, they were characterized as owner type ("O"), internally promoted management type ("M") or professional management type ("P"). As an exceptional type, entrepreneurs in Chinese telecommunication carriers were characterized as "bureaucrat entrepreneurs" ("B").

5. Three Generations of ICT Entrepreneurs in China

ICT entrepreneurs in China can be divided into three generations.

The first generation, who were mainly born in the 1930s and 1940s and most active in the 1980s and 1990s, contributed to reorganizing state-owned enterprises into market-oriented business entities. Most of them did not have access to venture capital and could not earn large sums from listing their companies on the stockmarket. They were mainly motivated by reorganization itself and are now gradually retiring.

The second generation was mainly born in the 1950s and the first half of the 1960s, studied technology at university and distinguished themselves in business circles in the 1990s. They either founded their own companies or succeeded to management positions occupied by members of the first generation. The former group did not generally have access to venture capital but earned large sums of money through stockmarket listing. The latter group did not establish their own companies but were simply internally promoted and took over management positions from the first generation. However, their business and social circumstances were utterly different from those of the first generation. They were professionalized, earned high salaries, and some of them took over as owners

while others were later head-hunted as management professionals.

The third generation was mainly born in the second half of the 1960s and the 1970s. Typical third generation entrepreneurs had access from the start to venture capital investment to establish their business based on a business plan. They emphasized the business model rather than the technology itself.

6. Hardware, Mobile Phone Manufacturing, Semiconductors and Software

For closer analysis, we divide the ICT industry into three sectors. The first sector includes hardware, mobile phone manufacturing, semiconductors and software. The second sector includes telecommunication carriers and the third sector covers net businesses.

Entrepreneurs in the three sectors are presented in Tables 2, 3, and 4, respectively.

Table 2 Chinese Entrepreneurs in Hardware, Mobile Phone Manufacturing, Semiconductors and Software

	Domestic Careerists	Returnees	Foreigners (including Taiwanese)
First Generation	Liu Chunagzhi (Lenovo M) Duan Yongji (Stone O) Wang Runnan（Stone O) Lü Ming (Great Wall M) Ren Zhengfei (Huawei O) Tang Ming (CS&S M) Wang Xuan (Founder M) Zhang Yufeng (Founder M) Wang Rongzhi (Tontru M) Hu Gang (Shida O)	Liu Zhiren (Neusoft M) Zhou Weikun (IBM M)	Richard Zhang (SMIC O)
Second Generation	Wei Xin (Founder M) Wu Shihong (IBM P) Yang Yuanqing (Lenovo M) Guo Wei (Digital China M→O) Chen Zhaoxiong (Great Wall M) Yang Xiu (Tontru O) Sun Pishu (Inspur M) Li Dongsheng (TCL M→O) Shi Yuzhu (Giant, Stone O) Jia Hongbing (Shida P) Wang Wenjing (UFIDA O) Xu Shaochun (Kindee O)	Wu Ying (UTStarcom O) Tang Jun (Microsoft→Shanda P)	Li Kaifu (Microsoft→Google P) Lu Hongliang (UTStarcom O) Amelio (Lenovo P) He Jinghua (Kindee P)

	Wang Mingjian (TCL M), Xu Lihua (Bird O)		
Third Generation	Feng Jun (aigo O) Wang Zhidong (Stone→ Sina.com→Click O)	Wu Ping (Spreadtrum O) Deng Zhonghan (Vimicro O)	

Source: Nakagawa [2010c]

Table 3 Entrepreneurs in Chinese Telecommunication Carriers

	Domestic Careerists	Returnees	Foreigners (including Taiwanese)
First Generation	Zhao Weichen (U B) Yang Xianzu (U B) Zhang Hainan (S B) Zhang Ligui (T→M B) Zhou Deqiang (T B), Wang Jianzhou (U→M B)		
Second Generation	Qi Mingqiu (J B) Xi Guohua (N B) Zhang Chunjiang (N→M B) Chang Xiaobing (T→U B) Wang Xiaochu (M→T B) Zhao Jibing (T B) Rui Xiaowu (S B) Xiang Bing (U B) Li Zhengmao (U→M B')	Tian Suning (sN→N P)	
Third Generation			

Notes: T: China Telecom; U: China Unicom; M: China Mobile; T: China Tie Tong; N: ChinaNetcom; S: China Satcom; J: Jitong; sN: China (Small) Netcom.

China (Small) Netcom and Jietong were integrated in China Netcom; China Tie Tong was integrated in China Mobile; China Netcom and the GSM network of China Unicom were integrated in new China Unicom; and the CDMA network of China Unicom and the basic telecom part of China Satcom were integrated in China Telecom.

B: Bureaucrat Entrepreneurs, P: Professional Management

Source: Nakagawa [2009]

Table 4　Entrepreneurs in Chinese Network Businesses

	Domestic Careerists	Returnees	Foreigners (including Taiwanese)
First Generation			
Second Generation	Shi Yuzhu (Giant/Stone O) Qiu Bojun (Kingsoft O)	Tang Jun (Microsoft→Shanda P) Mao Daolin (Sina.com P)	
Third Generation	Jack Ma (Alibaba O) Feng Chujun (Wanwa O→Nothing) Wang Zhidong (Stone→Sina.com→Click O) Yang Xueshan (ChinaEdu O →Nothing) Lei Jun (Kingsoft P→O) Feng Jun (aigo O) Ding Lei (Netease O) Ma Huateng (Tencent O) Cheng Binghao (Kaixin001 O) Chen Tianqiao (Shanda O) Wang Leilei (Kong.net P) Yao Xin (PPlive O)	Zhang Chaoyang* (Sohu O) Wang Shen* (TOM P) Cao Guowei (Sina.com P) Victor Koo (YOUKU.com O) Zhu Jun (The9 O) Yang Guomeng (TOM P) Huang Bo (ChinaEdu P) Robin Lee (Baidu O) Chen Xiaowei (The9 P) Chen Yizhou (Oak Pacific O) Wang Yan (Sina.com M) Wang Wei (Tudou O) Zhou Yunfan (Kong.net O) Yang Ning (Kong.net O)	

Notes:*Zhang Chaoyang and Wang Shen were born in 1964, but are categorized as second generation judging from their business model.
Source: Nakagawa [2010a], [2010c], [2010d]

Conclusion

From Tables 2, 3, and 4 and the profiles of the entrepreneurs reviewed in Nakagawa [2008], [2009], [2010a], [2010b], [2010c] and [2010d], we can conclude as follows.

Generations and Returnees

In the first generation, the role of returnees was limited. Mainly domestic career entrepreneurs contributed to the reorganization of state-owned enterprises. Liu Zhiren of Neusoft is an exceptional case. In the third generation, however, Zhang Chaoyang (Sohu), Robin Lee (Baidu) and so on introduced the search engine and portal site model to China. Moreover, they introduced a new business establishment model, that is, obtaining venture capital investment from the outset on the basis of a business plan and listing on a stock market after several years, for example, NASDAQ.

Fields and returnees

In the telecommunication carriers, we find no returnees except for Tian Suning of small Netcom. In this field, entrepreneurs have a China-specific character. They build their careers in the combined field of bureaucracy and business, where opportunities for returnees are limited. In the net business, in contrast, returnees contributed through introduction of new technology and new business models to the development of the Chinese ICT industry.

Business model and returnees

Although returnees played a major role in the development of the ICT industry in China, we should nevertheless not exaggerate their role. Even in the third generation, big names such as Jack Ma (Alibaba), Ding Lei (Netease), Chen Tianqiao (Shanda), and Ma Huateng (Tencent =QQ), who not only founded their own companies, but also originated various fields in the Chinese industry, are domestic careerists. They were able to learn the business model from advanced countries directly or from returnees' companies in China. Moreover, they developed new models more suitable for Chinese business circumstances.

We conclude that AnnaLee Saxenian's "brain circulation" model must be understood in these terms with reference to China.

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