

# Co-opetition in Pursuing Global markets: Evidences from China's ICT Sector

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**Abstract.** China's efforts in standardization and innovation together with their leading information and communication technologies (ICT) manufacturers' global market pursuing have been noticed as part of an ambitious signals for global competition. Based on a detailed empirical examination of Chinese ICT sector, we could come to the following conclusions. First, the so-called indigenous IPR has been an important part of China's technology policy and has been used as a tool to stimulate and boost innovation; secondly, the Chinese multinational companies have graduate realized and viewed IPR as an necessary weapon or leverage on their way to the global market; thirdly, despite the unsophisticated innovative activities, by holding the learning-by-doing and the co-petition strategy, these pioneering companies will hopefully play a significant role in global competition.

**Keywords:** innovation; global competition; ICT industry; intellectual property

## 1. Introduction

The last two decade has witnessed the information and communication technologies (ICT) dramatically transforming the world, enabling innovation and productivity increases, and boosting competition and cooperation across the world. Chinese manufacture industries have long been regarded as the latecomers for international technology competition, ICT sector in particularly. As one of the most fast-growing and prosperous markets, China has recently become one of the focus of global economy. Since the WTO entry, China has speed up its steps of technological innovation and global competition. China needs to catch up in the international race to innovate, and ICT sector provides a good and feasible opportunity.

This article targets on figure out why and how Chinese ICT manufacturers co-petition with global leading manufacturers for pursuing their domestic and global markets by engaging in the global innovation race.

## 2. Innovation and Global Competition

### 2.1. Determination to Become an Innovation-based Country

Recently, China's aspirations seems have begun to move up the value chain through innovation. This change can be seen in the Outline of National Medium and Long-term Science and Technology Development Plan (2006-2020). The key to implementing China's innovation-oriented strategy is to enhance indigenous innovative capability, especially through enhancing the capability of creating and producing intellectual property rights (IPR) for key advanced technologies and selected strategic industries. China's way of promoting innovation and global competition dominantly by ICT standards pull and patent push [1,2]. Electronics innovation was the key to China's 30% surge in international patent applications in 2009.

### 2.2. Patent, Innovation and co-petition

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ICT industry has long been regarded as a sector highly depended on intellectual property system, patent in particularly. One of the reasons is that patent rights can help the manufacturers hold a positive negotiation position in the market. More interesting is that the ICT products usually contain many inventions, which may hold as patent rights by different patentees. Given such a district phenomenon, many studies have focused on the ICT market from different perspective, such as the frequent patent disputes or litigations, the fierce competitive scenario, and R&D and innovation race.

As suggested by Grindley and Teece and as shown by Arora et al., ICT is likely to fall in the sector which there is an “innovation tax” arising from patents[1,2]. Shapiro further emphasized that ICT industry is creating patent thicket and hold-up[1,2]. The ways to reduce the risks of those inevitable potentially infringement typically include cross-licenses, patent pools, and acquisition. To achieve their innovation tax and reduce the risk of infringement as well, patent applications and litigations seems are inevitable for those ICT manufactures. That is why we seen the patenting and patent litigation explosion repeatedly. Both actions have dual function as offensive and defensive weapons.

In recent years, people found that patent litigations prevalent the global ICT market. To convey and visualize the complicate but interesting litigation war, Thomson Reuters published a mobile patent suits map in May 2011, which aroused heated discussion. Everybody who interested in that litigation map wants to extract some meaningful information. As for this part, Choi has ever pointed out that patent litigation hold an information externality, that means patent litigation can be viewed as an information transmission mechanism[1]. Competitors and cooperators can get strategic technological or management information from those litigations.

The ICT sector dynamics largely depends on the complex relationships among stakeholders. As summarized by Tilson and Lyytinen[1], the wireless interface standard represents multiple coordination mechanisms that shape the industry structure. Hierarchical cooperation for standardization within the international community is highly desirable. Tan further indicated that co-petition among firms and nations have had significant implications on the standardization of wireless communications across the world [1].

### **3. The Case of Chinese leading ICT manufactures**

While the United States and Europe countries are trying to maintain their lion’s share of the digital economy in global market, China want to increases its own share in proportion to its growing capacity for manufacturing and innovation. A couple of evidences as examined below showed that Chinese companies are getting know the international competitive and cooperative rules more and more, and learning to harness these rules gradually, but not an veteran.

#### **3.1. Launching a Patent March**

According to the multinational companies’ experiences and Chinese industries’ costly lessons, China has figured out that IPR is important in pursuing global markets and vital to its long-term global success. The government has pledged to increase R&D expenditures, and the business R&D expenditure has keep a continue growing. The indigenous innovation and IPR prevails in China.

As a type of R&D outputs, IPR has long been viewed as an important instrument to stimulate and protect innovation. It seems China is seeking to protect and incentive innovation globally in this way. According to the data released by World Intellectual Property Organization (WIPO), China has become the world’s fourth largest patent applications at the end of 2010. WIPO indicated under the framework of the Patent Cooperation Treaty (PCT), China’s international patent applications has submitted 12,339 patents in 2010 as compared to 7,900 patents in 2009, an increase of 56.2%. Much of the boom probably comes from university spin-off companies in dozens of university science parks that China has established. Only two Chinese companies are in WIPO’s top 100, the telecom giants Huawei Technologies and ZTE Corporation, and they account for only 16% of the country’s rise, indicating that most of the applicants are smaller players. In 2010, the top 10 PCT applications from China almost are in the ICT sector. Figure 1 shows the dominant ICT players’ PCT applications from 2005 to 2010. Global leading PCT applicants in the ICT sector are as shown in table 1.

China's patent explosion is partly attribute to the greater investment in R&D by the government over the past decade, and partly due to specific incentives at academic institutions that encourage patent filing. Although there is no linear relationship between R&D expenditure and patent filing activity or innovation, and not all R&D leads to new products or processes, there is still a positive and significant correlation between R&D investment and PCT applications across the top PCT applicants.

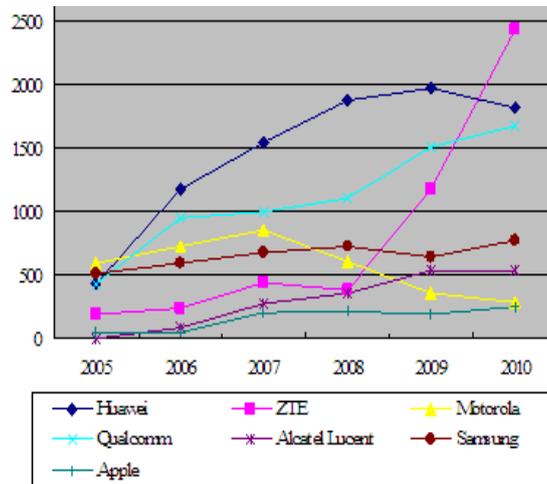


Fig.1. PCT Applications of the Dominant ICT Players (2005-2010)

Table 1. Global Leading PCT Applicants in ICT Sector

Applicant's Name	Country of Origin	PCT Applications		
		2008	2009	2010
Panasonic	Japan	1,629	1,891	2154
Huawei	China	1,737	1,847	1528
Qualcomm	U.S.	907	1,280	1677
Ericsson	Sweden	984	1,240	1149
LG	South Korea	992	1,090	1298
NEC	Japan	825	1,069	1106
Siemens	Germany	1,089	932	833
Nokia	Finland	1,005	663	632
Samsung	South Korea	639	596	578
Motorola	U.S.	778	538	290
ZTE	China	329	517	1863
Sony Ericsson	Sweden	402	435	289
Nokia Siemens	Germany	--	313	345

Behind the gorgeous patent data, information should not be omitted is that foreign researchers play an increasingly impressive important role in China's R&D and innovation activity. WIPO's World Intellectual Property Indicators in 2010 indicated that China given a high share of co-inventors in the foreign-owned PCT applications, which is quite different from both Korea and Japan. This a

Currently, the problem for China is that the quality of the Chinese abroad patent application. The fact is that Chinese application showed a high application with low grant ratio. Another interesting phenomenon is that the oversea patent application was largely concentrate on the ICT sector.

### 3.2. Attack and Anti-attack by Using Patent Litigation

It is believed that patent litigation is all about leverages. Leverage in the market, in licensing negotiations, or at the very least in settlement discussions[1]. Recent experiences across United States and

Europe have shown that many hi-tech industry players, like ICT, are using cutting-edge tactics in search of that leverage; most of those players are patent owners; many of them are so-called non-practice entities (NPEs). However, whatever they are, companies across the electronics and ICT sectors can learn a lot from them about offensive or defensive litigation strategies. In the ICT sector, the motives behind the attack and anti-attack patent lawsuits either a market-oriented or a defensive reaction. Therefore, companies should have in place both offensive and defensive litigation strategies in pursuing global markets.

About ten years ago, for Chinese Companies, it was hard to imagine what it would be for a Chinese company involved in a multinational lawsuit, not to mention in the name of protecting the intangible property. China traditionally holds a deep-rooted spirit of harmony brings wealth. Lawsuits are not usually the best way to solve disputes. However, thanks to the reforms and opening-up in 1980s, and the development of Chinese law system, people learn to protect their rights more positive.

Another sign of China's rising IPR prowess is the recent patent litigations, centered in U.S. and Europe countries, between global leading telecommunications technologies holders and Chinese pilot telecom vendors, like Huawei and ZTE, two large Chinese networking and telecom manufacturers. During last two years, Huawei has involved in thirteen lawsuits in the U.S. Among the lawsuits, nine cases were sued in the name of infringing the IPR, and only four cases initiated by Huawei. ZTE, as another global telecom market pioneer also suffering from the IPR litigations. More interesting phenomenon is the battles between Huawei and ZTE in both domestic and overseas markets for global dominance. Analysts summarized it as China's pragmatism innovation, the so-called learning-by- doing.

### **3.3. Taking the R&D Network Global**

Taking the R&D globally is a successful effort for many leading high-tech multinational companies building their position of global technology leader. As regard the reason why they running R&D globally, Bhattacharya and Zablitz indicated that globalizing R&D offers three key opportunities: harnessing global talent and innovation, localizing design and development to capture growth, and improving the cost-effectiveness and efficiency of R&D for them to avoid across cultural difficulty and achieve the object of global technology leader in their penetrating global market[2]. Chinese ICT companies like Huawei, ZTE, and Lenovo also well versed this and have established their overseas R&D centers globally. Based on Tung's study, outward FDI from China has been taking off since the mid-1990s[1] . The outward FDI was focused in sectors where international competition is higher such as electronics, ICT, and other high-tech manufacturing industries.

According to the annual report, Huawei so far has running 16 overseas R&D centers which distributed in different countries, such as United States and Europe countries. A latest media reported that Huawei Technologies will invest 150 million U.S. dollars to set up its own R&D campus in Whitefield, Bangalore — the first company-owned research facility outside China. It is believe that this R&D campus as a type of R&D center can play a key role in developing the leading technologies and global intellectual property. Other examples include Lenovo, a Chinese leading PC maker, and Haier, a multinational consumer electronics and home appliances company.

To gain the technological complementally advantages, some Chinese companies even choose their competitors or upstream/downstream companies to set their joint innovation centers.

## **4. Discussion**

With the development of the globalization and international competition, Chinese companies have got gradually familiar with the global competition rules and tried to participate in the games.

China needs to catch up in the international race to innovate, and ICT sector provides a good and feasible opportunity. Learning-by-doing as a pragmatism strategy is feasible and efficient strategy for Chinese companies to catch up their global competitors. Innovative capability has been essential for enabling China to participate in global competition. From the history of 1G, 2G, and DVD, the Chinese government and Chinese firms have identified promotion of indigenous alternative technology as the best way to lessen the dependence on foreign technology and the royalty fees.

According to Hu and Jefferson, international economic integration, particularly the vast inflow of FDI, has expanded the technological opportunity for domestic firms to innovate and imitate[3]. In addition, the rising concentration of FDI has raised the stakes for protecting their IPR for foreign firms while potentially motivating domestic Chinese firms to use patents as a strategic tool to counter competition from foreign-invested firms.

As regard the answer about what is really behind China's recent patent explosion. Different people hold radical different viewpoints. Although China is ramping up its patent applications, their value is questionable. It is believe that the quality of Chinese applications has not kept pace with their volume, and the country still has far to go before it can establish itself as a dominant player in intellectual property.

## 5. Summary

China's recent efforts in standardization and innovation together with their leading ICT manufacturers' global markets pursuing have been noticed as part of an ambitious signals for global competition. While current literatures on managing innovation have mainly focused on developed world, this paper tries to shed some light on the ICT sector in developing countries, by examining the case of China. Through an empirical examination of the competitive and cooperative practices in the ICT sector, this paper analyses Chinese ICT manufacturers' strategies and lessons in pursuing global market and its relationship to Chinese overall national innovation strategy.

Based on a detailed empirical examination of Chinese ICT sector, we could come to the following conclusions. First, the so-called indigenous IPR has been an important part of China's technology policy and has been used as a tool to stimulate and boost innovation; secondly, the Chinese multinational companies have graduate realized and viewed IPR as an necessary weapon or leverage in their way to the global market; and thirdly, despite the unsophisticated innovative activities, by holding the learning-by-doing and the competition strategy, these pioneering companies will hopefully play a significant role in global competition. While serious challenges are faced by China's ICT innovation efforts in the market place remains to be seen, China's determinant and ambitious will have a profound impact on Chinese and global economy and on Chinese firms and multinational firms in the global market.

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## 7. References

- [1] A. Zhan, Z. Tan: Standardization and Innovation in China: TD-SCDMA as a Case, *International Journal of Technology Management*, 2010, 51(2-4): 453-468.
- [2] D. Cyranoski: China's Patents Push, on <http://www.nature.com/news/2010/100215/full/news.2010.72.html>, 2010.
- [3] P.C. Grindley, D.J. Teece: Managing Intellectual Capital: Licensing and Cross-licensing in Semiconductors and Electronics, *California Management Review*, 1997, 39 (2): 1-34.
- [4] A. Arora , M. Ceccagnoli and W. M. Cohen: R&D and the Patent Premium, Cambridge, MA: NBER Working Paper No. w9431, 2003.
- [5] C. Shapiro: Injunctions, Hold-Up, and Patent Royalties, *American Law and Economics Review*, 2010, 12(2): 509-557.
- [6] C. Shapiro: Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard Setting, in *Innovation Policy and the Economy*, Adam Jaffe, Joshua Lerner, and Scott Stern, eds., National Bureau of Economic Research, vol. 1, pp. 1190-150, 2000.
- [7] J. P. Choi: Patent Litigation as an Information-Transmission Mechanism, *The American Economic Review*, 1998, 88(5): 1249-1263

- [8] D. Tilson, K. Lyytinen: The 3G Transition: Changes in the US Wireless Industry, *Telecommunications Policy*, 2006, 30(10-11): 569-586.
- [9] Z. Tan: Global Competition and Cooperation in Standardization of Wireless Communications, *Managing Telecommunications and Networking Technologies in the 21st Century: Issues and Trends* (eds.), Idea Group, Pennsylvania, 2001, pp.108-128.
- [10] W. Cook, D. Bevan: The Ultimate Leverage Tacticians, *Managing Intellectual Property*, 2007(169): 24-28.
- [11] A. Bhattacharya, H. Zablitz: Taking the R&D Network Global: Meeting the Challenge of Getting it Right, 2009, on <http://www.bcg.com/documents/file25452.pdf>.
- [12] R. L. Tung: Perspectives—New Era, New Realities: Musings on a New Research Agenda: from an Old Timer. *Asia Pacific Journal of Management*, 2005, 22(2): 143-157.
- [13] A.G. Hu, G.H. Jefferson: A great Wall of Patents: What is Behind China's Recent Patent Explosion? *Journal of Development Economics*, 2009 (90): 57–68.