The evolution of China’s IPR system and its impact on the patenting behaviours and strategies of multinationals in China

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Abstract: This paper first reviews the evolution of China’s IPR system with an emphasis on the patent system, which is mainly shaped by three forces including the transition to a market economy, the opening of the domestic market and the national initiatives for cultivating indigenous innovative capabilities. Then by using some unique data both at the national level and firm level, it analyses the patenting behaviours and strategies of foreign multinationals in China in comparison with local firms, which has yielded some interesting findings. First of all, the patent deployment of multinationals in China is mainly market-oriented and strategic. Although the negative perception of China’s IPR system has led multinationals to act defensively, they have been able to adapt to the Chinese system and maximise their economic benefits, in addition to gaining competitive advantages. Also, while multinationals’ patenting in China has created some obstacles for local firms to catch-up, it has also forced some of them to find new ways to innovate and develop their own capabilities.

Keywords: China’s IPR system; patent system; multinationals; patenting behaviours; patent strategies.


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1 Introduction

The year 2008 marks the 30th anniversary of China’s openness and economic reform, which has generated astonishing high economic growth in China for the past 30 years. According to the World Bank’s statistics (World Bank, 2003), for example, the average growth rate of Chinese gross domestic product (GDP) during the 1980s and the 1990s were 10.1% and 11.2%, respectively, making it one of the fastest growing economies in the world. The abandonment of centralised planning and the establishment of market institutions were credited as keys to the success of this growth. However, as a key institution to stimulate innovation in a market economy, IPR system has been the subject of frequent controversies in discussion about China’s transition to a market economy. While complaints about China’s IPR system have been abundant, systematic studies and analysis have been relatively rare. In this paper, based on some unique data, we intend to analyse the evolution of China’s patent system, the bedrock of China’s IPR system and its impact on the innovative behaviour of multinational companies.

The conventional wisdom about IPR is that strong IPR protection generates incentives for the investment in research and development (R&D) and hence for the technological progress in society (Arrow, 1962; Nordhaus, 1962; Scherer, 1972). In addition, IPR protection also helps to disseminate technical information and reduce social cost (Malchup, 1958), which is always referred to as ‘information disclosure effect’. At the same time, protecting IPR through assigning monopolistic right to the knowledge also entail economic costs. The monopoly position on the technology deters other firms from trying themselves to invent ‘in the neighbourhood’ (Scotchmer and Green, 1990; Green and Scotchmer, 1995). The fact that granting IPRs is not costless to society implies that one should not grant IPRs where benefits do not exceed the costs (Mazzoleni and Nelson, 1998), which maybe particularly true for developing countries (Commission on Intellectual Property Rights, 2002).

During recent years, the process of economic globalisation has enabled intellectual property to cross international boundaries more easily. For many developed countries, IPR-intensive goods and services constitute a rising share of the income they derive from their presence in foreign markets. It is therefore not surprising to see political economy forces at work in these countries, leading governments to raise IPR protection as a key negotiating issue in international trade agreements. Rules on how to protect patents, copyrights, trademarks and other forms of IPRs have become a standard component of international trade agreements. Most significantly, during the Uruguay round of multilateral trade negotiations (1986–1994), members of what is today the World Trade Organization (WTO) concluded the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which sets out minimum standards of protection that most of the world’s economies must respect. IPR is also a key issue between China and other foreign countries during bilateral talks, such as the second Sino-US Strategic Economic Dialogue (SED) held in May 2008.

Understanding IPR’s role in China is further complicated by the fact that Chinese economy in the reform era has been far more open than many other countries at its comparable stage. The IPR system in China from the very start faced with the double challenges of meeting the demand of multinational companies which required strong protection of IPRs while at the same time satisfying the appeal of domestic companies which favoured an IPR regime conducive to technology transfer and diffusion.
In this paper, using some empirical evidence from China, we will try to describe how China’s IPR system, especially the patent system, has evolved since the economic reform and analyse how multinational firms have responded to this changing system, in comparison with local firms. Our analysis will be carried out at the two levels. The first level is based on data at the national level, including patent data on application, grants and so on. The second level is based on data from a sample of multinational firms. Here we use Fortune Global 500 (Fortune, 2006) list as the population of investigation. From the list provided by State Intellectual Property Office (SIPO) of foreign firms that have at least one invention application until the end of 2004, we selected 775 related corporations. We then searched in SIPO’s database and found 108,747 pieces of invention application by these firms between 1 April 1985 to 31 December 2004, which account for 30.47% of the total foreign invention applications in China during the same period. As the comparison sample, we chose 500 of China’s largest corporations in 2006. Also from the list provided by SIPO, we selected 652 related corporations which have at least one invention application by the end of 2004 and found 16,109 pieces of invention application of these firms during 1 April 1985 to 31 December 2004, which account for 4.62% of the total domestic invention applications in same period. For each piece of invention application, we obtained the following information of it: application date, grant date, prior-right, patentee, inventors and their residences, IPC section number and IPC class number.

The remainder of the paper is organised as follows: Section 2 is a brief literature review; Section 3 describes the evolution of China’s IPR system with a special focus on China’s patent system; Section 4 examines the patenting behaviour of multinational firms in comparison with domestic players based on national data; Section 5 analyses the patenting strategies and behaviours of selected multinational firms in China based on the dataset described above. The final section, Section 6, concludes the paper.

2 Literature review

2.1 Foreign patenting surge

Merges (1992) figured that the jump in foreign patenting activity is driven by changes in the legal environment for patent holders. Industrial countries have revised their patent protection standards since the eight General Agreement on Tariffs and Trade (GATT) round. These changes have not only broadened the rights of patentees but also strengthened the protection of intellectual property rights (Maskus, 1993, 1998).

A different explanation for foreign patenting surge stresses the type of technological revolution that has been widening technological opportunities (Greenwood and Yorukoglu, 1997). But more literatures find that patents can be used by their owners in a variety of strategic ways in the market place to pursuit and maintain competitive advantages that do not necessarily conform to the original idea of patent as an innovation policy (Grindley and Teece, 1997; Berkowitz, 1995; Thumm, 2004; McQueen, 2005). Foreign patenting is an effective means to reduce the risk of imitation during overseas expansion (Rafiquzzaman and Whewell, 1998). It offensively and defensively blocks following-up research, thereby foreign rivals’ competing capability is constrained accordingly (Shapiro, 2001). Foreign patents enhance invention values and improve technological image of the firm, thereby attract more venture capitals (Lerner, 2000).
Patents also provide motives for workforce. Moreover, granting licenses to enterprises in foreign countries is profitable and proves to be an important means to recoup the cost involved in foreign patenting activities. Patents also serve as ‘bargaining chips’ that allow companies to enter cross-licensing negotiations with counterparts (Hall and Ziedonis, 2001).

2.2 Determinants of foreign patenting

Limitations on resources not only inhibit small-medium enterprises (SMEs) from filing for foreign patents, but also limit their ability to commercialise patented inventions and thereby profit from them (Cordes et al., 1999; GAO, 2002). Thus, SMEs generally patent abroad less often than their large-scaled counterparts (Mogee, 2000; Blind et al., 2004).

It is assumed that distance has a negative effect on international patenting activity. Neighbouring countries have especially high inter-country patent flows (Slama, 1981; Soete and Wyatt, 1983; Grupp and Schmooh, 1999). Nevertheless, Sun (2003) observed distance an insignificant issue in explaining foreign patenting in China. The host country market size also exercises an important influence (Kumar, 1996). If the foreign market is not attractive or big enough, the inventors will not bother to file patents there (Schiffel and Kitt, 1978). It is estimated that 1% increase in the GDP of the destination country produces a close to 0.64% rise in patenting activity of foreign firms in it (Mohammed and Lori, 1998). IPR protection is another determinant in international patenting decisions. Piracy in under-developed and developing countries makes multinationals particularly careful filing patents in them (Yang et al., 2004).

2.3 Multinationals’ patenting in China and its impacts

Most of the literatures related to multinationals’ patenting in China concentrate on the shortages or weak enforcement of China’s IPR protection system (Houdard, 1998; Weldon and Vanhonacker, 1999; Guvenli and Sanyal, 2003; Greguras, 2007; Yang et al., 2008). As Glass and Saggi (2002) figured, even if the resource wasting consequences of stronger IPR protection were not present, the induced incentive for imitation would still generate a reduction in FDI and innovation. But most of existing researches are on copyright piracy and counterfeit. Empirical analyses based on systematic data are rare. The discussions about multinationals’ IPR strategies in China are often summaries of best practices which published on business journals (Greguras, 2007; Yang et al., 2008).

Some literature built formal models about the relationships between foreign patenting and local technology spill over, taking patent applications as the indicator (Barton, 1998; Rivette and Klein, 2000; Baldwin et al., 2000; Baldwin and Hanel, 2003). But empirical studies of China reflected opposite views. Liu et al. (2003) found that there was a positive correlation between current domestic patents application quantity and foreign application quantity a year before, thus they concludes the existence of spill over. Hu (2006) detected a significant correlation between the number of patents granted to domestic inventors and the number of patents granted to Taiwanese, Japanese and Korean inventors. Furthermore, domestic patents are quite similar with foreign ones. Hu’s findings indicated that domestic and overseas inventors mutually simulated innovations.

Still others insisted that multinationals are implementing patent deployment strategy in China, aiming to gain and keep competitive advantage over their competitors and their
The evolution of China’s IPR system

Evolution of China’s IPR system with a special focus on the patent system

While China began to adopt legal protection of intellectual property as early as in the 1960s, it was not until China’s openness and reform in the 1980s did China realise the importance of the need to protect intellectual property in a market-based economy. Two major forces have shaped the evolution of China’s IPR system over the last two decades. First of all, the transition from a centrally planned economy to a market economy provided the strong impetus for the development and improvement of China’s IPR system. Second, the openness of China’s market for FDI and the increased success of Chinese products in the overseas market generated pressure for China’s IPR system to accelerate its development to be in line with international standards. The recent push for indigenous innovative capabilities since the announcement of China’s median and long range S&T plan in 2006 has provided further steam for improving China’s IPR protection.

Figure 1 outlined chronologically major events in the development of China’s IPR system, including the publication of the Patent Law in March 1984. Apart from building up the legal system in protecting IPR and joining international organisations and conventions, China has also entered into agreements and memoranda with individual countries regarding the implementation of these laws, most notably the USA. China also subscribed to fully implement the TRIPs Agreement after its accession to the WTO in 2002. Today, the scope and level of IP protection in China is substantially in line with international standards and practice (OECD, 2005).

As mentioned previously, China enacted its first Patent Law in 1984 which came into force in April, 1985. In general, the Chinese patent system shares more similarities with the Japan patent system than with that of the USA. For example, the primary purpose for China’s Patent Law is to facilitate diffusion of new technologies, which is demonstrated by the kinds of patents allowed (invention, design and utility model), their shorter grace period, the adoption of the principle of ‘first-to-file’ instead of ‘first-to-invent’, public disclosure of the invention after 18 months and mixed requirements of single and multiple-claims. Typically, the adoption of ‘petty patents’ such as utility models and designs are mainly based on the intention to encourage gradual innovation which is often very important for the domestic applicants in developing countries. This intention has been achieved partially according to some empirical studies (Liu et al., 2003; Hu, 2006).
Figure 1: Timeline of major national and international IPR laws and regulations

Major International Treaties, Conventions and Agreements Signed by China

1950
 Provisional Regulations on the Protection of Invention Rights and Patent Rights

1952
 Provisional Regulations on Trademark

1956
 Regulations on Encourage Inventions

1963
 Regulations Governing the Control of Trademarks

1982
 Regulations to Encourage Improvements in Technology

1984
 Trademark Law

1985
 Patent Law

1989
 Copyright Law

1990
 Regulations for the Protection of Computer Software

1991
 First Amendment of Patent Law

1992
 First Amendment of Trademark Law

1993
 Berne Convention for the Protection of Literary and Artistic Works

1994
 Universal Copyright Convention

1995
 Geneva Convention for the protection of Producers of Phonograms against Unauthorized Duplication of their Phonograms

1996
 Madrid Agreement Concerning the International Registration of Marks

1997
 Strasbourg Agreement Concerning the International Patent Classification

1998
 Second Amendment of Trademark Law

2000
 International Convention for the Protection of New Varieties of Plants

2001
 Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)

1994
 Patent Cooperation Treaty

1995
 Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure

1995
 Locarno Agreement on Establishing an International Classification for Industrial Designs

Source: OECD (2008, p.410, Figure 9.2)
As Figure 2 depicts, China’s patent system has evolved through three stages. The first stage is from 1985–1992, which is the founding stage of China’s IPR system. Before 1985, China only had a Management System of Science and Technology outcome, which presumably belonged to the entire country. While China’s first Patent Law made it possible for individuals to file patents, it was difficult for inventors to extract monopoly rents except to get some promised material rewards (Alford, 1995). According to this law, individuals could not apply for patents for inventions relating to their job, using materials from work, or within one year of leaving that job. At the same time, without the permission of relevant administrative department in the government, SOEs couldn’t file their patents autonomously. The first Patent Law also excluded chemical, pharmaceutical and alimentary or process inventions from patent coverage, which were regarded as the intended predilection on domestic industries and additional disadvantages for foreign applicants (Mertha, 2005). These issues reflected the initial intention to balance between stimulating indigenous innovations and attracting the worldwide knowledge pools by enforcement of patent protection.

The second stage is from 1992–2000, when China’s patent system made substantial progress. In the first revision of Patent Law in 1992, the duration of patent protection of inventions was extended from 15–20 years and the duration of utility model and design patents was extended from 5–10 years; food, beverages, flavouring, pharmaceutical products and substances obtained by means of chemical processes were also covered by patent protection, as well as adding the domestic priorities for filing applications. As Figure 2 shows, all these amendments inspired rapid growth in patent applications. Individuals were allowed to own patents for invention-creations during work time if an agreement was made between individuals and employers.

The third stage is from 2001–2007 where China’s Patent Law experienced the second major revision in 2001. In this revision, state-owned and privately owned enterprises were treated as equals for obtaining patent rights. Other amendments were mainly made to fit the WTO requirement, especially those in TRIPs, for example, the simplification of examination process. This revision led to another surge in patent applications.

Since 2005, SIPO began to revise the Patent Law for the third time. The draft of the new version has just been sent to the National People’s Congress for approval in August 2008. The new revision of Patent Law and other legislations is an important step for implementing national IPR strategy, which had been drafted since 2004 and formally issued by the State Council in June 2008. This new national IPR strategy is in direct response to the changing innovation environment in China. In early 2006, China issued the Outline for National Medium and Long-range Science and Technology Development Plan (MLP) and initiated the national strategy for building an innovation-oriented country through cultivating indigenous innovation capabilities (OECD, 2008). On the other hand, there have been many complaints about the misuse of patent rights by multinationals in China, including the ‘patent thicket’ strategy and others, which were thought to distort the normal competition and harm the cultivation of indigenous innovation capabilities.

Accordingly, three major changes were proposed. First, a basic requirement for patent granting is changed from ‘relative novelty’ to ‘absolute novelty’, which means that the granted patents should not only be novel in China, but also be novel in world. Second, the revised version strengthens the protection of heredity resources and traditional knowledge. The invention or creation based on illegal acquisition of heredity
resources and traditional knowledge would not be granted patent. Third, it adds the articles on the prohibition of misuse of patent rights. All these revisions could be regarded as responses to the changes of internal and external environments which China is facing. Compared with previously two revisions, this new revision probably will not generate a major change in the quantity of patent application. Rather, it may improve the quality of patent applications.

Figure 2 The three stages of China’s Patent System Development (see online version for colours)

Besides legislation, IPR enforcement system in China has also experienced some changes. Different from most other countries, China has a dual system of IPR protection, the judicial and administrative. Before the Special People’s Court System was established to handle IPR protection cases and disputes in 1992, the patent enforcement function was performed by Intellectual Property Offices (IPOs) in the administrative system. The patent enforcement issues dealt with by IPOs include infringement, ownership disputes, patent counterfeiting and etc. In China, administrative approach is a convenient, low-cost and flexible method of regulatory enforcement, compared with judicial approach. The IPO staff conducts investigations and helps to negotiate between the two parties. So most of the cases are resolved by intercession or withdrawn. As for the judged cases, if a fine is levied, the infringers are required to pay it into a special bank account and the enforcement branch will follow up. As a result, in 2005, China’s courts at all levels totally accepted 2,947 patent cases, among which infringement and ownership disputes accounted for the majority (SIPO, 2005a). In the same year, the IPOs system accepted 3,901 patent enforcement cases, among which 1,492 were infringement and ownership disputes (SIPO, 2005b).
4 Patenting behaviours of multinationals under China’s patent system in comparison with local firms

As discussed previously, a major concern of this paper is to examine the impact of China’s patent system on the behaviours of multinationals and domestic firms. In this section, we use the annual data issued by SIPO to examine the general situation of China’s patent application and grant, as well as validity and implementation, especially the different behaviours of foreign applicants in comparison to local firms8.

4.1 Source and character of Chinese patents

As Table 1 depicts, during the past 23 years, foreign applicants filed 795,984 patent applications in total in China. Among them, 86% were inventions (686,544) and 12% were designs (97,628). Utility models only accounted for 2% (11,812). Furthermore, the proportions of three types of patent applications have also experienced great changes during the past 23 years. In 2007, the foreign applicants submitted 1,325 utility applications, about 14 times of what they applied in 1985 (97). But during the same period, their invention applications in China expanded 20 times (from 4,493 to 92,101) and the design applications expanded nearly 38 times (from 371 to 13,993).

The following analysis of foreign patent behaviours will mainly focus on invention patents because of their dominant position in the total patents applied by foreign firms. Figure 3 shows that after a lukewarm start for the first 5–6 years of China’s patent system, foreign applications began to pick up after China revised its Patent Law in 1992. Foreign invention patent applications as the percentage of the total invention patent application reached the peak level of 62.24% in 1997. The second revision of Patent Law in 2000 induced another major increase of both domestic and foreign applications. While, the percentage of foreign invention patent applications stabilised in early 2000s and even decreased to some degree after 2004. The total invention patents granted to foreign applicants are still higher than to domestic applicants, but the gap has narrowed quickly in the past five years.

We can also find major differences on the character of foreign and domestic applicants. As Table 1 depicts that, in-service applications occupied absolute dominant situations in total applications received from abroad, most of which were filed by multinationals. Besides, the ratios of in-service applications in total foreign applications during past 20 years were very stable and rarely fell under 90%. On the other hand, the in-service applications haven’t exceeded 50% in annual domestic applications until 2007. What makes this difference? The answer lies partly in the kinds of patents applied. As Table 1 shows that, for the three kinds of patents, invention, design and utility model, there aren’t distinct differences between in-service and individual applications for foreign applications. On the other hand, there are significant differences between in-service and individual applications for domestic applications. For invention patents, more than 60% of the applications were in-service. However, this ratio was just over 30% for utility models and close to 40% for design patents. This seems to indicate that most of the ‘petty patents’ in China is developed by individuals, not firms and other organisations.
<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Invention</th>
<th>Utility model</th>
<th>Design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Ratio</td>
<td>Number</td>
<td>Ratio</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td>4576636</td>
<td>100.00%</td>
<td>1534934</td>
<td>100.00%</td>
</tr>
<tr>
<td>In-service</td>
<td>2310455</td>
<td>50.50%</td>
<td>1184568</td>
<td>77.20%</td>
</tr>
<tr>
<td>Non-service</td>
<td>2266181</td>
<td>49.50%</td>
<td>350366</td>
<td>22.80%</td>
</tr>
<tr>
<td>Domestic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td>3780652</td>
<td>100/82.6</td>
<td>848390</td>
<td>100/55.3</td>
</tr>
<tr>
<td>In-service</td>
<td>1545971</td>
<td>40.90%</td>
<td>522632</td>
<td>61.60%</td>
</tr>
<tr>
<td>Non-service</td>
<td>2234681</td>
<td>59.10%</td>
<td>325758</td>
<td>38.40%</td>
</tr>
<tr>
<td>Foreign</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td>795984</td>
<td>100/17.4</td>
<td>686544</td>
<td>100/44.7</td>
</tr>
<tr>
<td>In-service</td>
<td>764484</td>
<td>96.00%</td>
<td>661936</td>
<td>96.40%</td>
</tr>
<tr>
<td>Non-service</td>
<td>31500</td>
<td>4.00%</td>
<td>24608</td>
<td>3.60%</td>
</tr>
</tbody>
</table>

Note: Unit: file

Source: SIPO (2008)
The evolution of China’s IPR system

4.2 Patent validity

In order to understand how valuable a patent and its potential application is for the patentee, we can check whether the patentee is willing to pay the annual fee to keep the patent valid. As Table 2 depicts, till the end of 2007, among all granting patents by SIPO in the past 23 years, only 40% were still valid (in force). The validity ratios of three kinds of patents granted to foreigners are all higher than those for domestic patentees. The gap on inventions is not very large (66% to 80%), when compared with the huge ones on utility models and designs. These gaps are not surprising as we have found that most of the ‘petty patents’ are filed by individuals who are certainly financially less capable in maintaining their patents.

### Table 2

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Invention</th>
<th>Utility model</th>
<th>Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>Grant/application</td>
<td>51.87%</td>
<td>27.31%</td>
<td>67.17%</td>
</tr>
<tr>
<td></td>
<td>In force/grant</td>
<td>40.69%</td>
<td>74.61%</td>
<td>30.28%</td>
</tr>
<tr>
<td>Domestic</td>
<td>Grant/application</td>
<td>54.02%</td>
<td>20.10%</td>
<td>67.10%</td>
</tr>
<tr>
<td></td>
<td>In force/grant</td>
<td>34.76%</td>
<td>66.26%</td>
<td>30.05%</td>
</tr>
<tr>
<td>Foreign</td>
<td>Grant/application</td>
<td>41.87%</td>
<td>35.70%</td>
<td>77.44%</td>
</tr>
<tr>
<td></td>
<td>In force/grant</td>
<td>76.16%</td>
<td>80.09%</td>
<td>58.03%</td>
</tr>
</tbody>
</table>

Note: Unit: %

4.3 Patent implementation

There is no accepted definition of patent implementation or utilisation. It could mean making profits by putting the patent into application. It could also mean gaining competitive advantages through blocking others to innovate. Various patent models and strategies have emerged over the years, such as ‘patent thicket’, ‘patent trolls’ and etc. As some literature indicates, there are five main kinds of these strategic motives: protection, blocking, reputation, incentive and exchange (Blind et al., 2004). All these could be regarded as different means of patent implementations.

Because there is no official statistics on patent implementations in China, the data we used here are mainly based on a full-sample survey on the status of patent applications and implementations of China’s enterprises, which was performed by SIPO in 2006. This survey included all the firms that have issued patent applications in China since 1985. It involved 110,112 firms in total and the feedback ratio is 64.8%. A database was compiled based on this survey, which included 310,554 patent applications issued by 43,383 firms. In the sample, the (domestic) private controlled firms, state owned and controlled firms, collectively controlled firms, foreign controlled firms and HKT controlled firms respectively accounted for 55.8%, 20.6%, 11.8%, 6.2% and 5.7%. This is probably the latest and largest sample one can find about patent implementation in China. In this survey, patent implementation was divided into five modes: never implemented, implemented only by self, only licensed to others, self-implemented and also licensed to others, and transfer of patent privileges. From Figure 4 we can clearly see that, among different kinds of firms, the patent implementing ratio of foreign controlled firms is the lowest, nearly 26% of the total patent applications have never been implemented. The HKT controlled firms and (domestic) private controlled firms have the highest implementing ratio (more than 85%), partly due to the high ratio of designs among all their patent applications (more than 53%), compared with other firms. For these two kinds of firms, only less than 10% of their total patents applications have never been implemented. For all other kinds of firms, the dominant implementation mode is self-implemented exclusively. For most firms except foreign controlled ones, nearly 80% to 90% of the total patent applications are implemented only by themselves. In particular, among all the invention patent applications issued by foreign controlled firms, more than half (51.8%) have never been implemented. This ratio is much higher than any other kinds of firms, especially the HKT controlled firms (15.7%) and private controlled firms (less than 20%). As Figure 4 depicts, the collective controlled firms have the second highest un-implemented patent ratio. Further analysis shows that small collective firms have very high invention application rate (61%), as compared with 54% of large scale foreign controlled companies. Most of these small collective firms in China are high tech start-ups or spin-offs from universities and research organisations; this may be the reason why they have such higher invention ratios.

Although we don’t have comparable data about patent implementations in other countries, one can observe explicit contrast between foreign and domestic companies on patent implementing behaviours from this dataset. For example, all the patents applied by LG China R&D Center had never been implemented, but all the patents applied by Huawei Corporation had been implemented by itself. This seems to indicate that compared with Chinese firms, multinationals in China are more likely going to use patent applications for strategic purposes, which has been relatively rare for Chinese firms.
4.4 Patent litigations

Hipel (1988) comes to the conclusion that the value of a patent depends to a great extent on how the patent offices of corporations (patentees) and the courts handle the potential and actual infringement of patent rights. In more and more occasions, the main purpose of patent litigations may not be getting compensations, but to delay the expansion of opponents, or to force competitors to cross-license. So, from patent litigation behaviours, especially infringement litigations, we can partially observe how multinationals are using China’s patent institutions.

As Table 3 depicts, most of the infringement disputes were put forward by domestic patentees and mainly concentrated on utility models and designs, which were also dominated by domestic players. Similar phenomenon can also be observed in judicial fields. As Table 4 depicts, among all the civil cases about patent rights disposed by China’s courts, the infringement disputes have also accounted for the majority, whether in quantity or litigation money. But the infringement litigations filed by multinationals were very few, even under 50 cases a year until 2004.

This is very different from what one would hear from media reports. While multinationals have been criticising the weak IPR protection in China with one voice, our data indicate that they rarely initiate infringement litigations, whether through judicial means or administrative channels. This may suggest that the real damage to multinationals due to patent infringement may be limited. This was partially consistent with the results of some other surveys (European Union Chamber of Commerce in China, 2005). The more frequent cases of copyright piracy and brand counterfeiting, especially
in software, apparel and luxury goods have made the image of China’s IPR system much worse than it should be.

On the other hand, some studies also reveal that the judicial procedure about infringement in China is costly and complicated. For example, the proportion of claimed damages has to be posted as a bond if they go to the IPR court (La Croix and Konan, 2002) and the enforcement is quite weak. As a result, around two-thirds of patent infringement cases are not filed in court (Bosworth and Yang, 2000). Furthermore, because IPOs lack independent power and authority, the effectiveness of administrative enforcement is often affected (Mertha, 2005).

Table 3  Patent enforcement of the infringement disputes by the Administrative Authorities for Patent Affairs

<table>
<thead>
<tr>
<th>Year</th>
<th>Type</th>
<th>Total</th>
<th>Countries or regions</th>
<th>Sort of patents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A  B  C  D  E</td>
<td>F  G  H</td>
</tr>
<tr>
<td>2007</td>
<td>Accepted</td>
<td>986</td>
<td>881 (89.4%) 7 88 6 4</td>
<td>180 (18.2%)</td>
</tr>
<tr>
<td></td>
<td>Closed</td>
<td>733</td>
<td>660 (90%) 1 52 14 6</td>
<td>140 (19.1%)</td>
</tr>
<tr>
<td>2008 Jan–Jun</td>
<td>Accepted</td>
<td>487</td>
<td>450 (92.4%) 6 6 25</td>
<td>101 (20.7%)</td>
</tr>
<tr>
<td></td>
<td>Closed</td>
<td>373</td>
<td>337 (90.3%) 1 25 3 7</td>
<td>67 (18.0%)</td>
</tr>
</tbody>
</table>

Notes: 1 A = China, B = North America, C = Asia and Pacific, D = Europe, E = Others, F = Invention, G = Utility model, H = Design
2 The figures here were cited from SIPO Patent Statistical Annals and Monthly Bulletin, and there were only statistics of total numbers of patent disputes annually before 2007
3 Unit: case

Table 4  Civil cases of first instance about patent rights disposed by China’s courts

<table>
<thead>
<tr>
<th></th>
<th>Accepted</th>
<th>Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign affairs</td>
<td>14 4 -</td>
<td>5 39,544.9408</td>
</tr>
<tr>
<td>HK affairs</td>
<td>17 3 -</td>
<td>24 43,266.3502</td>
</tr>
<tr>
<td>Macao affairs</td>
<td>35 3 1</td>
<td>26 134,459.7942</td>
</tr>
<tr>
<td>TW affairs</td>
<td>15 4 -</td>
<td>7 43,472.7155</td>
</tr>
<tr>
<td>Total</td>
<td>2,081 1,796</td>
<td>28 144,078.2989</td>
</tr>
</tbody>
</table>

Notes: HK = Hong Kong, TW = Chinese Taipei
Unit: case, 10,000 RMB
Table 5  The main differences of domestic and foreign players’ patenting behaviours in China

<table>
<thead>
<tr>
<th></th>
<th>Foreign</th>
<th>Domestic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent type of applications</td>
<td>Invention dominant</td>
<td>Utility model and design dominant</td>
</tr>
<tr>
<td>Growth of applications</td>
<td>After 1992, distinct increase</td>
<td>After 1992, no distinct increase</td>
</tr>
<tr>
<td></td>
<td>After 2000, distinct increase</td>
<td>After 2000, distinct increase</td>
</tr>
<tr>
<td>Character of applicants</td>
<td>Invention</td>
<td>Invention, In-service just exceed</td>
</tr>
<tr>
<td></td>
<td>In-service dominant</td>
<td>In-service just exceed, Non-service recently</td>
</tr>
<tr>
<td></td>
<td>Utility model</td>
<td>Utility model, Non-service dominant</td>
</tr>
<tr>
<td></td>
<td>Design</td>
<td>Design, Non-service dominant</td>
</tr>
<tr>
<td>Granting ratio</td>
<td>High</td>
<td>Low, especially for invention</td>
</tr>
<tr>
<td>Valid ratio</td>
<td>Invention</td>
<td>Invention, Low, no big gap</td>
</tr>
<tr>
<td></td>
<td>Utility model</td>
<td>Utility model, Low, big gap</td>
</tr>
<tr>
<td></td>
<td>Design</td>
<td>Design, Low, big gap</td>
</tr>
<tr>
<td>Implementing ratio</td>
<td>Invention</td>
<td>Invention, High</td>
</tr>
<tr>
<td></td>
<td>Utility model</td>
<td>Utility model, High, relatively</td>
</tr>
<tr>
<td></td>
<td>Design</td>
<td>Design, Similar</td>
</tr>
<tr>
<td>Infringement litigation</td>
<td>Very few</td>
<td>Quite a lot, concentrated on utility model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and design</td>
</tr>
</tbody>
</table>

Source: Summarised by the authors

While this analysis of patenting behaviours of foreign players in China in comparison with local entities is interesting, we must also acknowledge its limitations. First of all, we must be mindful the fact that not all the patent applications in China are filed by firms. For example, by 2007, there were more than 20% of the total domestic in-service invention applications are filed by universities and colleges and more than 30% of the in-service invention patents were granted to them the same year. There were also many individual applications, especially for utility models and designs. Secondly, analysis here was mainly based on the observation of revealed patenting behaviours. We need to understand the motivations and strategic intentions underlying these behaviours, which is the focus of the next section.

5  Adapting to China’s IPR environment – strategies of multinationals in China

As pointed out in Section 4.3, patent strategy has been incorporated into multinationals’ business strategies, which could be partially revealed by their patenting behaviours. In this section we will take a closer look at multinationals’ patent strategy and its impacts, aiming at analysis of their specific techniques used to gain technical, economic and market advantages.
5.1 ‘Patenting in advance’ strategy

As introduced before, here we choose 2006 Fortune Global 500 as the sample of multinationals and 500 China’s biggest corporations in 2006 as the comparison sample. Over the past 20 years, sample foreign firms have applied for totally 108,747 inventions in China, about 10 times of the applications filed by sample domestic firms in total. As Figure 5 depicts, before 2000, there was strong contrast between the two groups. Applications by domestic firms are less than 1/15 of that of foreign firms. After 2000, however, applications of domestic firms increased dramatically and reached 1/5 of that of foreign firms. As discussed before, although the technology gap had narrowed significantly, it is still large.

Figure 5  Invention applications of sample domestic firms and foreign firms (1985–2004) (see online version for colours)

With regard to multinational patent applications, firms from Japan, USA, Korea, Netherlands and Germany took 95% of the total foreign invention applications. More specifically, 22 multinationals with over 1,000 invention applications account for 71.29% of all the invention applications of the sample companies. Out of the top ten multinationals, five are from Japan, two from the USA and one respectively from Korea, Netherlands and Germany. These top ten firms account for 50.90% of the applications by the sample firms. Obviously, only a few multinational giants are the main players of patent games in China. Compared with the patentee distribution of foreign firms, the sample domestic firms’ applications are even more concentrated. Huawei Technology Company took up about one third of total sample domestic firms’ applications, nearly the same as those by the top five foreign firms combined. This example illustrates the fact that patenting inventions by domestic firms in China is limited in a very small group of firms. This is not inconsistent with the findings of Hu (2006) that foreign patent surge in China is the result of competitions among foreign companies themselves.
Our study also reveals that out of the 108,747 invention patents filed by foreigners, 104,091, or close to 96% have priority dates. This means that these invention applications in China have been applied abroad before, most likely in their home countries. This could partially answer the puzzle of ‘high validity, low implementations’ we discussed in previous section. It also confirms Hu’s speculation that the rapidly growth of the SIPO patents granted to foreign applicants is unlikely to have been driven by more and faster knowledge production in those foreign countries. It is likely that multinationals in these foreign countries are patenting a larger proportion of their existing inventions in China (Hu, 2006). It is also consistent with the findings of another research performed by our team (Zhu and Liang, 2006a).

These observations seem to indicate that whether a multinational files invention applications in China or not is largely driven by market instead of technical considerations, the technology is already there! In another study we did on 135 multinational R&D centres in China (Xue and Liang, 2008)\textsuperscript{11}, we did a correlation analysis between their patenting data and the total revenue, total profit, foreign revenue, foreign profit respectively of each of the eleven industries. It is notable that in all the eleven industries, multinationals’ patenting activities are highly correlated with total revenue, or the overall Chinese market size\textsuperscript{12}. This is consistent with Sun’s finding that foreign patents in China are driven largely by demand factors (Sun, 2003). Moreover, in most industries, there is strong correlation between foreign patenting and foreign profit data\textsuperscript{13}. Ernst (2001) once concluded that multinationals patenting leads to excellent market performance. But our analysis seems to indicate that the causality can go both ways. Larger market potentials attract more patents, which could produce better market performance, which in turn inspires more patents for further expansion.

5.2 Transfer strategy

Licensing is the best known approach in transferring patented technologies. Because of the dominant positions of multinationals in controlling core technologies, domestic Chinese companies are price takers in patent licensing negotiations. Take DVD industry as an example. Patent alliances among multinationals, including 6C, 4C, DTS and MPEG LA have charged great amount of license fees on domestic firms (Table 6), which account for 20% to 30% of the total product cost and making the margin profit of each DVD less than 30 RMB.

Multinationals are also very careful in maintaining full control of their technologies in technology transfer activities with joint ventures in industries such as automobile industry, which has a history of joint ventures over 20 years. Foreign partners usually hold real decision-making power in joint ventures with regard to the core technologies and other forms of intellectual properties. In such joint ventures, it is not uncommon to find different fees charged related to IPRs. For example, a brand licensing fee is usually levied for every car produced in China. Technology licensing fee is charged for the new models that are put into trial-manufacturing or production in China. Equipment purchasing fee is also charged for the imported equipments by joint ventures from their foreign parent companies. These transfer strategies make it possible for the foreign partners to get over 75% of the profits while their equities in joint ventures have not exceeded 50%. At the industry level, according to the statistics of China Automobile
Industry Association, foreign joint ventures (excluding HKT JVs)\textsuperscript{14} only account for 16% in total automobile manufacturers in China, but they obtained 82.55% profits of the whole industry\textsuperscript{15}. Keeping a tight control of the core technologies and make the technology transfer process a black box for domestic collaborators have been useful strategies for multinationals (Lu and Feng, 2005).

As Tables 7 and 8 depict, opposite to the low level of patents owned by joint ventures, the foreign partners’ parent companies usually file large number of patents, especially invention patents, in China. They usually transfer technology to joint ventures at very high prices without disclosing the development processes and related details (Zhou et al., 2006). Such strategy has provided multinationals effective means to maximum their profits in China.

### Table 6 Patent fees domestic firms need to pay for each DVD

<table>
<thead>
<tr>
<th>Alliance name</th>
<th>Member companies</th>
<th>Fee ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6C</td>
<td>Hitachi, Panasonic, Mitsubishi, Toshiba, AOL Time Warner, JVC</td>
<td>4</td>
</tr>
<tr>
<td>4C</td>
<td>Philips, Sony, Pioneer, LG Electronics</td>
<td>0.0375</td>
</tr>
<tr>
<td>-</td>
<td>Thomson</td>
<td>1</td>
</tr>
<tr>
<td>DTS</td>
<td>DTS Digital</td>
<td>10</td>
</tr>
<tr>
<td>-</td>
<td>Dolby</td>
<td>4.95</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>19.9875</td>
</tr>
</tbody>
</table>

Notes: The practical licensing fee structure is a bit complicated and alterable according to production volume. The calculation here is based on assumption of a very low volume.

Source: Collected by the authors

### Table 7 Three kinds of patents owned by China’s top ten automobile firms

<table>
<thead>
<tr>
<th>Firm</th>
<th>Total</th>
<th>Share</th>
<th>Invention</th>
<th>Utility model</th>
<th>Industrial design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai General Motor</td>
<td>54</td>
<td>11%</td>
<td>0</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>Shanghai Volkswagen Motors</td>
<td>58</td>
<td>12%</td>
<td>8</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>FAW-Volkswagen</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Beijing-Hyundai Automobile</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Guangzhou Honda Motor</td>
<td>1</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Tianjin FAW-XiaLi Automobile (now Tianjin FAW-Toyota Automobile)</td>
<td>5</td>
<td>1%</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Cherry Automobile</td>
<td>272</td>
<td>56%</td>
<td>15</td>
<td>70</td>
<td>187</td>
</tr>
<tr>
<td>Dongfeng Nissan Automobile</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Geely Automobile</td>
<td>50</td>
<td>10%</td>
<td>6</td>
<td>9</td>
<td>35</td>
</tr>
<tr>
<td>Dongfeng Peugeot Citroen Automobile</td>
<td>50</td>
<td>10%</td>
<td>3</td>
<td>9</td>
<td>38</td>
</tr>
</tbody>
</table>

Note: All data are due on 31 July 2006

Source: Zhu and Liang (2006b, Table 3)
The evolution of China’s IPR system

Table 8 Three kinds of patents owned by foreign parent automobile companies in China

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Invention</th>
<th>Utility model</th>
<th>Industrial design</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Motors</td>
<td>231</td>
<td>230</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Volkswagon</td>
<td>291</td>
<td>254</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>Hyundai Motor</td>
<td>489</td>
<td>460</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>Honda Motor</td>
<td>3,861</td>
<td>3,000</td>
<td>57</td>
<td>804</td>
</tr>
<tr>
<td>Toyota Motor</td>
<td>1,994</td>
<td>1,260</td>
<td>41</td>
<td>693</td>
</tr>
<tr>
<td>Nissan Motor</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PSA/Peugeot-Citroen Mobile</td>
<td>18</td>
<td>14</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>6,887</td>
<td>5,221</td>
<td>98 (1%)</td>
<td>1,568 (23%)</td>
</tr>
</tbody>
</table>

Note: All data are due on 31 July 2006
Source: Zhu and Liang (2006b, Table 4)

However, overcharging in technology transfer process might produce deadlocks. For example, since January 2004, China’s domestic telecom firms, together with Ministry of Information Industry (MII) started negotiation with foreign telecom firms on 3G patent licensing. The negotiation has not achieved much progress yet. It was reported that the main obstacle was that Qualcomm has a dominant advantage in this field and was overcharging during negotiations.

Part of the reason why multinationals seems to have adopted somewhat different approaches in China is the relatively weak IPR protection environment, or at least the perception of it. For example, licensing is often regarded as the normal procedure for transferring technology in the global market, but it is not commonly used in China. Also, large multinationals abroad are usually the dominant suppliers for patents, equipments and technical know-how, which is often the most important part of the technology transfer (Chen and Sun, 2000). But in China they have adopted the approach of ‘total product package’ in which technologies are included as parts of greater complex technical systems (Bruun and Bennett, 2002).

5.3 Litigation strategy

Just as Merges and Nelson (1990) pointed out, it matters less that every patent is a potential contribution to innovation than that it may infringe or be infringed. IP infringement and litigation has long been in existence and is a powerful means in competition with other firms. In China, patent litigation has been used by multinationals as a strategic weapon in the market competition. At the initial stage of a market development process, multinationals usually apply for a large number of patents. They tend to ignore infringing behaviours, partly due to the high cost and low benefit of patent litigation at this stage. But when the market has grown to a scale large enough, they will initiate litigations against competitors who have infringed their patents. Again, China’s DVD industry is a good example. Most of the domestic firms accepted the high licensing price under the threat of infringement litigations and possible triplicate penalties, although they had operated in this field for ten years.
In fact, due to the large technology gap between multinationals and domestic firms, patent infringement may not be as serious in China as what has been perceived. The real challenge lies in copyright piracy and brand counterfeiting, which is much harder to enforce. According to SIPO, in 2007, China’s industry and business administrative authorities disposed 50,318 lawbreaking cases related to brand counterfeiting, of which, 10,320 (20.51%) are concerned with foreigners. Over 28.17 million illegitimate brand marks were sequestrated and destroyed. In the same year, China’s copyright administrative authorities totally sequestrated more than 75.69 million pieces of piracy goods, including 52.49 million discs of piracy media products and 3 million sets of piracy software\textsuperscript{16}. While these figures seem really striking, the piracy and counterfeit problem could not be solved easily in a short time (Potter and Oksenberg, 1999; Simone, 1999), because of the low cost and low technology requirements of these activities.

Despite such difficulties, litigation strategy has also been used effectively by multinationals, such as Microsoft. When they initially entered the Chinese market many years ago, there was piracy of Windows System or other software everywhere in China. Microsoft did not jump on it and let the market grew. About ten years ago, Microsoft began the litigation process targeted at some well-known domestic firms, such as Asia Information Technologies (Yaxin). This strategy has effectively facilitated the popularisation of its licensed software’s in China’s government and local firms. Most recently, when the market shares of Windows is large enough (about 95% of China’s operating system), Microsoft has begun to attack piracy comprehensively. In October 2008, Microsoft started its ‘Black Screen Action’ in mainland China. The computer desktops of those users of pirate Windows XP systems will automatically change into black screen once in an hour as a reminder to the users that they are using pirate software, as long as the system has been confirmed as piracy by Microsoft through internet validating technologies\textsuperscript{17}. At about the same time, it initiated the litigation on a famous software website in China named ‘Tomato Garden’. The administrator of this website was sued to make profits by selling modified XP system on this web\textsuperscript{18}.

Besides litigation in domestic market against domestic firms, multinationals also initiate litigations against domestic firms when they begin to enter international markets. The most well-known case is Cisco’s litigation against Huawei, the Chinese telecom equipment company. Cisco alleged Huawei ‘misappropriated’ its IOS(r) source codes, command line interfaces (CLI), technical documents and five patent technologies relating to Cisco’s router protocols early 2003 in US. Cisco’s accusations involved eights types, including patent infringement, copyright infringement, business secret infringement, common law misappropriation, trademark law infringement, unfair competition, etc. The focus of lawsuit was Huawei’s Quidway routers, 18 suits of which had just been sold in the US. Most analysts regarded this as Cisco’s business strategy to prevent Huawei’s fast infiltration on Cisco’s dominated high-level market and slow down its worldwide expansion\textsuperscript{19}. The strategy seems to have worked.

5.4 Alliance and standard strategy

Several years ago, some scholars and specialists in China investigated the patent pools of DVD alliances such as 6C and 4C. They found quite a few patents are actually trivial and do not add value to the overall package. There are also a number of patents which had
already expired. In December 2005, Prof. Zhang Ping, the IPR Professor of Peking University issued an invalidation appeal to the patent Re-examination Committee of SIPO on a patent (ZL95192413.3) of Philips that was included in 4C patent pool as an essential patent, because it was regarded as not meeting the creativity and novelty requirement for a patent. By January 2006, another four famous scholars also initiated similar appeals. After more than one year’s negotiation, Philips finally came to a compromise by agreeing to withdraw this patent from existing patent pool\textsuperscript{20}.

This case illustrated that technology and standard alliances are often taken as the carrier by multinationals to implement their patent and standard strategy. In the DVD case, such strategy was successful mainly because of the technology gap between multinationals and domestic firms, which allowed the multinationals to take advantage of the ignorance of domestic firms and made invalid claims in the patent pool. Related to this technology gap, Chinese firms are rarely able to join international technology standard setting process, which has been discussed extensively.

A technology standard in the age of globalisation is not only a solution or a specification for certain technological problems or issues, but also a governance mechanism that can be used by patents owners as an instrument to redistribute economic interests and hold the first-mover advantages (Wang and Liang, 2007). As Kennedy et al. (2008) indicated, controversies over the relationships between IP and standardisation have also pointed to some larger questions about who participate as stakeholders in standardisation, the balance between standards as public goods and standards as mechanisms to facilitate private gains and the ways in which standards support or frustrate innovation. And central to the standards-innovation relationship is the role of intellectual property in standards. Leading firms in the global ICT sector have taken a range of approaches toward IP that are closely linked to their business models (Kennedy et al., 2008). Most of the researches on standard and standard alliance place the issue in the commercial context and focus on the activities of corporations. Nevertheless, some scholars have pointed out that standard setting in reality is a much politicised process, especially in the global context (Funk, 1998).

In recent years, Chinese government has been trying to help Chinese firms to break the barriers of technology standards with mixed results. A series of works detailed China’s efforts to set and commercialise ICT standards domestically, include IGRS, TD-SCDMA, AVS, ITopHome, etc. (Suttmeier and Yao, 2004, Suttmeier et al. 2006; Kennedy et al., 2008). While multinationals are generally reluctant to join such efforts due to a number of reasons, some multinationals do participate in these processes as observers instead of formal members. In this way, they can obtain information, demonstrate goodwill toward their Chinese partners and the government and be better placed to take advantage of opportunities in the event that a local standard achieves commercial success (Kennedy et al., 2008).

In this section, we have tried to describe and analyse various patent strategies adopted by multinationals in China. In general, multinationals in China have been very effective in taking advantage of China’s unique business and IPR environments to protect their market competitiveness and economic interests. At the same time, it is clear that multinationals in China, in addition to their normal IPR strategies, have adopted some over-protective practices that may have led to the loss of potential gains. For example, the reluctance of multinationals in transferring technologies and capabilities to their local joint venture partners may have hurt the competitiveness of the joint venture, which in
term, hurt the interests of the multinationals. At the same time, there is also an urgent need for the government to further improve the IPR protection through legal and administrative means, particularly in the area of enforcement. Such effort would help multinationals to better understand the IPR environment in China and make right business decisions. Multinationals should also be mindful that some of their IPR strategies may have been on the verge of patent misuse. Because of the long absence of anti-monopoly law in China, such behaviours have not led to any negative consequence. With the passage of China’s antimonopoly law, the situation will certainly change.

6 Conclusions

Despite the political rhetoric about the weak IPR protection in China, multinational companies have done remarkably well by adopting a whole set of strategies in protecting their technologies while at the same time expanding their markets over the years.

At the early development stage of China’s patent system in 1980s through 1990s, the patent system was almost irrelevant to multinationals’ overall operations in China since most of the technology transfers were through proprietary technology exchanges or equipments and key parts importations. Multinationals were able to do so partly due to the weak absorptive capabilities of local firms, which could seldom developed similar technologies even by ‘reverse engineering’. In occasions of building joint ventures with local partner, a package deal were often selected by multinationals, including the contracts of financial investment, proprietary technology and trade secret exchanges, technology services and consulting, patent licensing, etc. Multinationals have also fully exploited China’s patent system to maximise their benefits by strategic deployment and implementation of these patents. In many occasions, they use China’s patent system to acquire strategic competitive advantage rather than to gain monopoly rent from their technological advantage. But in the eyes of multinationals, most of these behaviours may not differ much from their presence elsewhere including home countries, and which are just regarded as business competition tools, not discriminatory treatments.

Multinationals have also played very important roles in stimulating innovations in local firms. Although most Chinese firms have not yet become true innovators, multinationals have provided good examples for some local companies to imitate and learn on how to use IPRs to improve their innovative capabilities. Huawei’s story is a case in point. Cisco’s litigation against Huawei directly stimulated the formulation of Huawei’s IPR strategy: ‘protect and utilise autonomous IPRs, respect IPRs of others, improve core competence and strongly support global product strategy’. The successful implementation of this strategy has resulted in an astounding total of 29,666 accumulative patent applications by June 2008. It also became the 4th largest patent applicant under the WIPO PCT, with 1,365 applications published in 2007, just behind Matsushita, Philips and Siemens. Huawei followed a competitive strategy not only relying heavily on IPR protection of the core technologies, but also using its own technological advantage to integrate global innovation resources. It has developed new collaborative relationships with multinationals. For Huawei, multinationals’ role has been changing. Initially, they were ‘teachers’, which means that they are sources of knowledge...
The evolution of China’s IPR system and role models. At the next stage, multinationals were ‘competitors’, which indicates that multinationals felt the threats of local firms and take actions to restrain their expansions and competitions. At the final stage, multinationals became ‘partners’ because the local firms have grown to be strong enough to work equally with multinationals. So, the relationship between multinationals and local firms is not static, they evolve not only according to the changing capabilities of local firms, as well as changes in China’s IPR system.

While China’s patent system has played important roles in stimulating innovations for both multinationals and domestic firms, its net impact on technology transfer is not very clear. On the one hand, the patent system has provided basic protection to multinationals which makes sustained major patent infringement very difficult. On the other hand, the perceived weak enforcement of IPR system has also deterred the willingness of multinationals to transfer their cutting-edge technologies to local firms through ‘normal modes’ such as licensing. At the same time, the reluctance of multinationals to transfer technology may have also forced some local firms to explore other ways to breakthrough instead of ‘following up’, which indirectly induce indigenous innovation and improvement of local capabilities. The net benefits and costs of these direct and indirect impacts are difficult to assess.

Another interesting phenomenon in the dynamic relationships between multinationals and local firms is related to the emerging cases of local firms launching infringement litigations against multinationals in China or abroad. The most famous case is Zhengtai Group’s litigation on Schneider Electric (Tianjin) Corporation’s infringement on its utility model patent of circuit breaks. The court of first instance made the judgment to support Zhengtai’s demand for compensation of 330 millions RMB, which was a record in China’s domestic infringement litigation cases. Although this case is still in process, it really inspired the enthusiasm of local firms on patents to develop their own IPRs and their IPR strategies.

Overall, the evolution of China’s IPR system and its impacts on multinationals and local firms is a complicated co-evolution process. As discussed previously, the latest emendation of Patent Law has not only reflected the criticisms of bad behaviours by both domestic firms and multinationals, but also reflected the need for more original innovations in China. How would multinationals and local firms respond to these changes would be interesting to watch and warrants further research in the future.

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References


The evolution of China’s IPR system


Notes

1 SIPO is the abbreviation of State Intellectual Property Office of the People’s Republic of China.

2 Here we use invention data instead of patent data because inventions represent most technology creation comparing with other two forms of patents. And this is also the only comparable patent field between multinationals and domestic firms because most of the patent applications of multinationals in China are in-service inventions and domestic firm is also the only dominant applicants in domestic in-service invention applications.

3 One same firm might has several sub firms applying for patents in China.


5 One same firm might has several sub firms applying for patents in China.

6 In patent, a priority right or right of priority is a time-limited right, triggered by the first filing of an application for a patent. The priority right belongs to the applicant or his successor in title and allows him to file a subsequent application for the same invention and benefit, for this subsequent application, from the date of filing of the first application for the examination of certain requirements. When filing the subsequent application, the applicant must ‘claim the priority’ of the first application in order to make use of the right of priority. The period of priority is usually 12 months for patents.
The Strasbourg Agreement (of 1971) concerning the international patent classification (IPC) provides for a common classification for patents for invention including published patent applications, utility models and utility certificates. The IPC is a hierarchical system in which the whole area of technology is divided into a range of sections, classes, subclasses and groups. This system is indispensable for the retrieval of patent documents in the search for establishing the novelty of an invention or determining the state of the art in a particular area of technology.

All the data used here are cited from SIPO Statistical Annals, if not indicated specially. According to the classification and definition of SIPO, in-service patent equals to corporate patent in other countries, non-service patent equals to individual patent.

The sample is the same to the research project ‘Globalisation of R&D by MNCs in China’ which commissioned by Beijing Municipal S&T Committee and performed during 2004 to 2005. More details and findings of which could be found in Xue and Liang (2008) and OECD (2008).

The statistical significances are all higher than 90%, most of them are higher than 95%. In some sectors that FDI concentrated such as computer peripherals, pharmaceuticals and automobiles, the significances even reach 99%.

Ibid.

The joint ventures founded by Hong Kong, Macau and Chinese Taipei firms and mainland firms.


China had just formally issued the Antimonopoly Law in August 2008 and only gives the definition of IPRs misuses in principle.


Available at http://www.huawei.com/corporate_information/research_development.do.
