Intellectual property law, technology flow and licensing opportunities in the People’s Republic of China

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Abstract

This study explores the interrelationship between intellectual property (IP) law and technology transfer via licensing activity in China. In the absence of patent, trademark, design and utility model laws, and their effective enforcement, advanced country firms will be rarely willing to license technology to developing countries. The enactment and enforcement of such laws in developing countries, therefore, should result in greater international IP flows from advanced nation firms seeking to exploit market opportunities by exporting, licensing and direct foreign investment. Within just 20 years, China has moved from viewing IP as public property to having in place a raft of modern IP legislation. We relate these changes to the upsurge in IP activity in China since 1985, both in aggregate and by country of origin, and to technology flows from Japan and the USA. We then discuss remaining weaknesses in China’s legislative framework and enforcement procedures. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Patents; Trademarks; Intellectual property legislation; Licensing; China; Technology transfer

1. Introduction

Many if not most countries today have policies in place to obtain information and technology from abroad. For developing countries, with comparatively weak internal mechanisms for the generation and successful application of new products and processes, this need can be particularly acute. The international firm, through its inbound
foreign direct investment (FDI) and licensing activities, represents to developing countries a ready conduit through which technology can flow from the more advanced economies. However, the willingness of advanced country firms to exchange technology with developing countries often depends crucially on the existence of a legal framework of intellectual property rights (IPRs) that protects locally the interests of technology owners. Indeed, the protection of intellectual property (IP), as patents, trademarks, service marks and copyright, is now at the forefront of the globalisation of markets in ideas, technology and economics (Rader, 1996). Nevertheless, the existence of IP laws is not sufficient to bolster technology transfers to developing countries. With the exception of a few areas of technology where trade secrets are adequate protection, IP laws need to be strong, effective, and most importantly, enforced, if both affiliate and non-affiliate licensing from abroad is to be encouraged.

Nevertheless, from the perspective of the developing country, there is a delicate balance between the protection of IP and the promotion of an indigenous stock of knowledge to aid economic development. It is logical to expect countries that are predominantly users of externally generated IP to be less likely to protect it than countries that are net producers of IP (Pasco, 1998). Anecdotal evidence from a number of countries that have moved to developed status suggests that “copying”, often illegally, is important in the early stages of this process, with Japan perhaps being a good case in point (Cheetham, 1998). However, a country’s preparedness to continue “copying” during its early development is mollified by the importance to economic growth of participating in world trade, in terms of both imports of technology and exports to advanced countries. The central role of strong, local IPR in lowering barriers to global markets for technologies became clear during the Uruguay Round of the General Agreement on Tariffs and Trade (GATT). Seven years of negotiations eventually resulted in the Agreement on Trade-Related Aspects of Intellectual Property Rights: Including Trade in Counterfeit Goods (henceforth, the TRIPs Agreement) (Beier & Schricker, 1989). Today, the protection of IP is a key element of international trade negotiations (Lin, 1996).

Of course, the introduction of strong IP protection, through new legislation and its enforcement, is not without cost to the country concerned. It implies that copying will result in infringement and, by implication, the use of extra-mural technology involves the negotiation of an economic payment to licence or purchase the technology. Nevertheless, without such legislation and appropriate enforcement, a developing country erects a barrier that restricts the inflow of more advanced technology. The greater willingness of developing countries to introduce IP protection reflects the growing recognition of the crucial need to access advanced technology to improve competitiveness and promote development.

The People’s Republic of China (PRC) provides a particularly interesting case in which to study the interrelationship between IP protection legislation and the promotion of inbound technology flows through foreign licensing. At different times, the PRC has held diametrically opposed views with respect to the treatment of IP. Legal protection of IP has been available in most Western countries for many years: UK patent laws, for example, are argued to date back to the 20 year monopoly for
the manufacture of coloured glass given to John of Utyman in 1449, and systematic
records date from 1617 (Boehm, 1967). Similarly, US patent and copyright laws are
based on Article 1, Section 8 of the Constitution of the USA (O’Connor & Lowe,
1996). Until recently, for both philosophical and political reasons, the PRC offered
little or no protection for IP. However, this situation has now altered dramatically;
from 1982 onwards, a raft of IP-related legislation has been enacted.

This paper documents the principal changes to IP laws within the PRC, and dis-
cusses the various internal and external pressures that have brought these changes
about. We explore the effects of new legislation on IP activity in the PRC and on
the potential for stimulating licensing. In particular, we examine the evolution of its
legislative regime alongside the flow of patents, designs, trademarks and utility mod-
els into the PRC from other countries. These flows are important, as they are the
forerunners of technology transfer and licensing activities by foreign and Chinese
firms. We go on to consider more generally certain apparent weaknesses in current
laws in the PRC, arguing that further improvements may give rise to greater inflows
of IP and licensed technology.

2. Evolution of the Chinese system of IP protection

Cultural influences affect profoundly the legal system and the manner by which
it operates in each country. “A fundamental distinction in the focus and manner of
living in each culture is largely responsible for the development of different attitudes
toward dispute resolution, and ultimately the formulation of various legal systems”
(O’Connor & Lowe, 1996, p. 75). Chinese legal tradition stems from two philo-
sophies: “Confucian” and “Legalist”. Confucianism dominated Chinese legal thought
through to the Republican revolution of 1911. It was a system of “government by
men”, with emphasis placed on moral education and ethical conduct. Legalism, in
contrast, denied that morality could determine the social order. Legalism was a sys-
tem in which rulers established the law without the say of the people, and the state,
rather than the individual, guaranteed social behaviour. Legalism had an important
influence on Chinese law, and elements of both philosophies pervade the current
system. The Chinese legal system that evolved protected the interests of the state
and society as a whole, as opposed to the individual. The result was that: (a) no
independent system of administering and enforcing the law was established in the
PRC; (b) the emphasis on harmony and self-governance gave rise to an aversion to
adversarial conflicts and public disruptions. This is in considerable contrast to the
more adversarial and confrontational Western legal system (O’Connor & Lowe,
1996).

The concept of IPR has always been at odds with the teachings of Confucianism.
On the one hand, IPRs are government-sanctioned monopolies that seek to protect,
by forbidding free copying, the “original thought” of the IP-owner. On the other,
Confucianism considers that learning takes place through copying and that imitation
is a form of flattery (O’Connor & Lowe, 1996). Despite this apparent contradiction,
the PRC has experimented with IP protection on a number of occasions over the
last 100 years or so, notably during the Westernisation movement of the latter half of the 19th century (Bosworth & Yang, 1999). More recently, two distinct phases can be identified in the evolution of the PRC’s policy towards IP protection.

2.1. Phase one: “reward system” of the early post-war period

During the post-war period, from 1949 to 1978, there were in effect no IPR laws in the PRC. Instead, the central government exercised very stringent administrative control over inventions and publications. The private ownership of IP conferred by a system of IPRs ran counter to the PRC’s planned economy, in which public ownership was advocated. Individual welfare was, and arguably still is (at official levels at least) subordinate to social welfare and national interest. During this period the PRC borrowed a range of ideas from the former Soviet Union. One was an administrative control system for inventions that specified the reward to be paid for inventions and publication, similar to the reward system under the Soviet Certificates of Authorship (Balz, 1975). As a consequence, between 1950 and 1963 only four patent rights and five inventions were granted in the PRC. As late as 1963, the government promulgated a new regulation, Regulation on Invention Reward, which again emphasised socialist public ownership. This law stipulated that “all inventions are national assets, any individuals and organisations are not allowed to apply for a monopoly. All the organisations around the country, including collective enterprises can use them” (Art. 23). Under this regulation, inventors could not apply for patent rights, but just received a lump sum bonus. In 1966, during the Cultural Revolution, even this compensation was abolished. Consequently, scientific and technological achievement yielded little or no financial benefit, and innovation was stifled. Between 1966 and 1978, only 7700 items of scientific and technological achievement were registered by the Chinese authorities (Liu, 1996), a situation which, as we shall see, contrasts starkly with that of today.

2.2. Phase two: legislation and international conventions, 1980 onwards

By the late 1970s, the PRC had clearly come to recognise that a policy of direct government control was not consistent with attracting investment and technology inflows, and that the formation of a formal system to protect IPRs was a prerequisite for further economic development. The PRC established a Patent Office in 1980, and discussions were held on the establishment of a patent system. From 1982 onwards, a series of laws and regulations on technology transfer and IPR protection were promulgated, and there was a further spate of activity in the early 1990s. Table 1 presents the most important enactments of Chinese legislation over this period. Details of the precise nature and content of these laws can be found elsewhere (Bosworth & Yang, 1999; Feng, 1997; Tan & Borg, 1998; Zheng, 1987). Registerable rights were addressed first (trademarks and patents), with the recognition of unregistered rights (particularly copyright) taking rather longer (Wheare, 1998).

In addition, the Chinese government further demonstrated its desire to improve and modernise its IPR protection regime by joining a number of international IP
Table 1
Selected IP related legislation of the PRC

<table>
<thead>
<tr>
<th>IP-related legislation</th>
<th>Year enacted and revised</th>
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<tbody>
<tr>
<td>Trademark law of the PRC</td>
<td>1982 and 1993</td>
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<tr>
<td>Patent law of the PRC</td>
<td>1984 and 1992</td>
</tr>
<tr>
<td>Regulations of the PRC on the administration of technology introduction contracts</td>
<td>1985</td>
</tr>
<tr>
<td>Implementing rules of the Ministry of Foreign Economic Relations and Trade for examination and confirmation of export enterprises and technically advanced enterprises with foreign investment</td>
<td>1987</td>
</tr>
<tr>
<td>Rules for the implementation of the regulations on the administration of technology introduction contracts</td>
<td>1988</td>
</tr>
<tr>
<td>Copyright law of the PRC</td>
<td>1990</td>
</tr>
<tr>
<td>Implementing regulations of the copyright law of the PRC</td>
<td>1991</td>
</tr>
<tr>
<td>Regulations on computer software protection</td>
<td>1991</td>
</tr>
<tr>
<td>Implementing regulations of the patent law of the PRC</td>
<td>1992</td>
</tr>
<tr>
<td>Implementing regulations of the trademark law of the PRC</td>
<td>1988 and 1993</td>
</tr>
<tr>
<td>Decision on copyrights infringement punishment</td>
<td>1994</td>
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</tbody>
</table>

Details on the nature and content of the various laws can be found in Bosworth and Yang (1999); Zheng (1987); Feng (1997); Tan and Borg (1998).

organisations and by signing up to various international conventions (see Table 2). Taken together, these actions indicated the positive attitude of the PRC toward improving the degree of legal protection for IP. Although the PRC only began to introduce a formal system of IPRs in the early 1980s, in a period of little more than a decade remarkable progress was made in putting in place a largely complete and modern framework for the protection of almost every aspect of IP. Through a series of revisions, this legal framework has moved from ambiguity to relative clarity.

Table 2
International treaties signed by the PRC in the area of IP

<table>
<thead>
<tr>
<th>International convention</th>
<th>Year Signed</th>
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<tbody>
<tr>
<td>Convention establishing the World Intellectual Property</td>
<td>1980</td>
</tr>
<tr>
<td>Organisation and a contracting country of WIPO</td>
<td></td>
</tr>
<tr>
<td>Paris convention for the protection of industrial property</td>
<td>1985</td>
</tr>
<tr>
<td>Treaty on intellectual property in respect of integrated circuits (signatory country)</td>
<td>1989</td>
</tr>
<tr>
<td>Madrid agreement concerning the international registration of marks</td>
<td>1989</td>
</tr>
<tr>
<td>Berne convention for the protection of literary and artistic works</td>
<td>1992</td>
</tr>
<tr>
<td>Geneva convention for the protection of producers of phonograms against unauthorised duplication of their phonograms</td>
<td>1993</td>
</tr>
<tr>
<td>Universal copyright convention</td>
<td>1992</td>
</tr>
<tr>
<td>Patent cooperation treaty</td>
<td>1994</td>
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<tr>
<td>Budapest treaty on the international recognition of the deposit of microorganisms for the purposes of patent procedure</td>
<td>1994</td>
</tr>
<tr>
<td>TRIIPS (signatory country)</td>
<td>1994</td>
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3. The “dual-track” system: administrative control versus judicial enforcement

While legislation can be promulgated relatively quickly and membership of international conventions can be negotiated in time, a country’s institutional attitude towards IP protection takes longer to change (Bosworth & Yang, 1999). Historically in the PRC, the administrative system has exerted strong power in the resolution of disputes and conflicts. It is only since the mid-1980s that a judicial system has been established to consider such cases. Consequently, a “dual-track” system comprising both administrative and judicial control now prevails (depicted in Fig. 1), and balance is only slowly shifting from the former to the latter. A third means of dispute resolution is through consultation, mediation and arbitration. The general order of preference in China runs from judicial litigation, as the least preferred, through to non-judicial administrative adjudication then private mediation as the most popular means of dispute resolution.

3.1. The non-judicial administrative route

Several organisations under the State Council are responsible for administering IP-related matters in the PRC (see Fig. 1 for the principal responsibilities and powers of each). The administrative authorities for patent affairs include the Patent Office
(PO), and the Patent Re-examination Board within the PO. The Trademark Office (TO) of the Administrative Authority for Industry and Commerce (AAIC) is responsible for trademark matters, while the Trademark Review and Adjudication Board (TRAB) of the AAIC is responsible for receiving and resolving applications for adjudication should the TO refuse to grant a trademark, and to administer trademark disputes. The National Copyright Administration (NCA) and its subsidiary, the China Copyright Protection Centre (CCPC, formed in 1998), are also administrative departments under the State Council. The CCPC appears to have a particular foreign focus, charged with computer software copyright registration and administration (Bosworth & Yang, 1999). Administrative control has also been established at the provincial levels to supervise copyright implementation within regional jurisdictions.

3.2. The judicial route

There are three different types of litigation relating to IP matters in the PRC: civil, criminal and administrative litigation. Civil and criminal litigation takes place in the Chinese courts, which comprise a five-tier system, depicted in Fig. 1. Depending on the seriousness and complexity of the case, the court can be manned by a single judge through to an adjudication committee. Civil litigation can lead to the removal and prevention of infringements, as well as damage-based compensation and profit-based compensation, with the latter allowing punitive damages to be considered. In addition, goodwill and moral rights damage can also be claimed. When civil and criminal liability co-exist, an injured party may claim for a civil suit and incorporate this in the criminal procedure. In this way, sanctions can be more efficiently and effectively imposed, lowering the costs of litigation, and avoiding double trials (civil and criminal) with the possibility of conflicting judgements, and so on (Potter & Oksenberg, 1999).

Since 1993, Special People’s Courts and Intellectual Property Trial Divisions have been established in the Intermediate and Higher People’s Courts in Beijing and other provinces, with jurisdiction to handle IP protection issues and disputes. Where there is no Special People’s Court or IP protection division, cases are handled in the economic divisions of the courts. Administrative procedures relating to IP infringement can also be conducted by the relevant state organisation. For example, the Patent Office and the Trademark Office are the administrative organs for patent and trademark depositions.

3.3. Consultation, mediation and arbitration

The traditional and preferred means of dispute resolution in the PRC is through the less confrontational processes of consultation, mediation and arbitration. These processes tend to be far less complex than the judicial route, and, consequently tend to be more predictable and less time consuming. Consultation and mediation also have the advantage in that they assist in the repair of relationships between the parties involved, because they are non-adversarial forms of dispute resolution that are more likely to result in compromise than conflict (O’Connor & Lowe, 1996). Arbitration occurs when the parties involved agree to submit the dispute to a non-governmental
arbitration institution. This is a quasi-judicial procedure, but, compared with litigation, is more flexible and less costly in terms of time and money. The parties to the dispute must abide by the adjudication of the arbitration organisation otherwise the relevant court imposes legal enforcement. The China International Economic and Trade Arbitration Commission (CIETAC) has become an important arbitration institution for dealing with disputes. From 1978 onwards, there has been a dramatic increase in disputes and, by the early 1990s, CIETAC was averaging around 100 arbitration cases per year (Potter, 1995).

4. Rationale for the new IP laws

Overall, the extent and speed with which the PRC has introduced legislation and policies to encourage the creation of IPR indicates the very positive attitude of recent Chinese governments towards IP and its protection. But what prompted this dramatic shift in attitude and position? It seems likely that it was a natural consequence of a number of influences and developments, from both within and outside the country.

4.1. Internal pressure and the “open door” policy of the PRC

The historical relationship of the PRC with developed countries has been characterised by periods of imperial dominance and economic invasion. This led the PRC to adopt a xenophobic stance to its political and economic relations during the 1950s and 1960s. However, this stance has relaxed considerably in recent years, as evidenced by China’s “open-door” policy. In many respects, an exploration of the reasons for the introduction of IPRs in the PRC is an investigation of the motives for its “open door” policies.

There is little doubt that by the mid-1970s the Chinese government had recognised the need to access new information and technologies in order to improve its international competitiveness and, thereby, its rate of growth and development. Despite the absolute size of its economy and population China was, nevertheless, a Third World country which was unable to generate sufficiently high levels of information and advanced techniques at a rate necessary to meet the growing desire for development. The lessons of other countries that achieved rapid development such as Singapore illustrated quite vividly the contribution that technology transfer could make, particularly through foreign direct investment. The internal pressure for change implied not only a move away from Confucianism, but also away from Marxism, Leninism and the doctrines of Mao Zedong.

In December 1978, the Chinese government established a general policy of reform, opening its economy to the outside world. The encouragement and utilisation of foreign direct investment — and its accompanying technology, capital, and expertise — became both a principal focus of the reform and the main economic objective in the PRC. On 1 July 1979, the *Law of the People’s Republic of China on Joint Ventures Using Chinese and Foreign Investment* was promulgated. What was equally clear, though, was the realisation that FDI and the associated information and tech-
niques would not be transferred without a significant shift in the PRC’s traditional approach to the protection and exploitation of IP. This led to the rapid introduction of new legislation, from around 1980 onwards.

4.2. Protection of indigenously created technology

In comparison with technology imported into the PRC, the corresponding level of technological exports has customarily been quite small. However, from the introduction of its “open door” policy in the early 1980s, China’s exports have gained importance, especially exports of technology (see Table 3). With the growing importance of technology exports, IPR protection became crucial in protecting China’s indigenously developed technology. There are two reasons behind this. First, according to Jiang (1995), 70–80% of the technology exported from the PRC was destined for developing countries, many of which for various reasons possessed weak IPR protection themselves. Meanwhile, Chinese state-owned enterprises had yet to acquire appreciable experience of exporting technology. Although foreign-invested enterprises (FIEs) will have made a significant contribution to China’s export performance in this regard, the fact that technology exports have increased significantly in recent years not only suggests there has been an upsurge in indigenous technology production, but also that the PRC required new laws and regulations to protect the interests of her inventors and other IPR holders.

4.3. External pressure

The drive in the PRC to improve the regime for IP protection was to some extent promoted by international pressure, especially from the USA. Because of weak protection and piracy, industrial countries, led by the USA, have continually campaigned for greater protection of their products in developing countries. The confrontation between the developed and developing world is exemplified by a series of disputes between the USA and the PRC (Sherwood, 1990). As a consequence, a number of bilateral and multilateral agreements have been signed between various developed and developing countries. More importantly, however, under pressure from the developed countries, a new element — TRIPS — has been injected into the international arena through GATT and the World Trade Organisation. Under TRIPS, any countries intent on accessing world markets must within 5 years introduce and enforce IP protection of the same standard as developed countries (Zheng, 1996).

Table 3
The value of technology exports from the PRC (US$mn)

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<tr>
<td>10</td>
<td>20</td>
<td>100</td>
<td>200</td>
<td>890</td>
<td>990</td>
<td>1280</td>
<td>1510</td>
<td>2174</td>
<td>1420</td>
</tr>
</tbody>
</table>

Source: authors’ calculations, based on Jiang (1995).
China’s first encounter with IPR issues of this type probably occurred when negotiating the “Sino–US High Energy Physics Agreement” and the “Sino–US Trade Agreement” in 1979 (Zheng, 1996). Negotiations between the two countries reached stalemate because of differences over the protection of IP. The USA side argued strongly that IP protection should be an integral part of any bilateral agreements on science and technology, culture and trade, without which agreements would not be signed. Equally, Chinese representatives involved in the negotiations were extremely reluctant to sign agreements that included clauses of which they had little or no experience. The research and debate that followed within the PRC has been labelled the first wave of “IPR fever” (Zheng, 1996).

Further pressure was placed on the PRC by the “Special 301” arrangement of the USA, introduced in its Omnibus Trade and Competitiveness Act of 1988. The effect of this Act was to add grievances about IP to the existing Section 301 regime (Lin, 1996). Section 301 authorises US trade representatives (USTRs) to retaliate against countries that have undertaken “unjustifiable, unreasonable or discriminatory” trade practices. Any enterprise or individuals can complain to the USTR. As a part of this, a Priority Watch List (PWL) of countries was established by the USTR to closely monitor IPR policies, acts, and practices, in order to determine whether action under Special 301 was required. In addition, the USA also uses a “Special Mention” list, consisting of countries that should further enhance their IP protection because of existing or emerging problems. Following a decision of the US International Trade Commission (ITC), Section 337 can be used to authorise US Customs to detain all imported products associated with IPR infringement.

In effect, any country that wants to establish trade relations with the USA must take account of Sections 301 and 337, or risk a trade war. During the period 1991–1995, the PRC was listed in the PWL twice (see Table 4). The influence of these two sections on the PRC is fairly typical. After the PRC became one of the priority countries under Special 301, the PRC and the USA conducted seven rounds of negotiations regarding IP protection. This resulted in the second phase of “IPR fever”. If the first phase caused a significant stir in China’s government, organisation and intellectual circles, the second caused a major shock wave, and IP issues gained high levels of publicity in the PRC at this time. The Sino–US Memorandum of Understanding on the Protection of Intellectual Property was signed in Washington in 1992. The PRC’s patent law was extensively revised, extending the term to 20 years and for the first time protecting pharmaceuticals and other chemical products and

Table 4
Priority watch list countries, 1991–1994

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<tbody>
<tr>
<td>PRC</td>
<td>Republic of China (Taiwan)</td>
<td>Brazil</td>
<td>PRC</td>
<td></td>
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<tr>
<td></td>
<td>India</td>
<td>India</td>
<td>Thailand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Argentina</td>
<td>India</td>
<td>Thailand</td>
<td>India</td>
</tr>
</tbody>
</table>
processes (Wheare, 1998). The threatened trade war was prevented. The PRC became the principal PWL country again in 1994, however, when the USA argued that copyright protection in the PRC was inadequate and also pointed to a lack of improvement in IP protection after the agreement in 1992. China and the USA again began negotiations under the threat of imminent trade retaliation, and an agreement was finally reached in 1995. This provided for a 6-month “crackdown” on piracy, including the closure of certain factories (most involved in compact disc production) and the setting up of regional task forces to co-ordinate enforcement activities. The signing of further bilateral agreements on IPRs followed in 1996. These focused on software, compact disc and other copyright piracy, which the International Intellectual Property Alliance (comprised of a considerable number of US copyright owners) alleged was costing them US$1.8bn per year in lost revenue (Wheare, 1998). This was the third wave of “IPR fever”.

While other developed countries, especially European countries, have also influenced the improvement of IP protection in the PRC, their powers of persuasion were much less than the USA. The USA is the world leader in more areas of technology than any other country and has the largest domestic market. It is also the largest country source of FDI in the PRC. The USA could therefore use its economic strength, along with its Special 301 rules, to adversely affect any particular economy where it felt that IPRs were inadequate. The USA has, characteristically, been adversarial in its threats to use Sections 301 and 337, and this appears to have exerted a strong influence on IP protection in the PRC. The willingness of the USA to invoke Special 301 is in itself understandable given the loss reported by US multinationals because of weak IP protection in developing countries at the time; estimated at a total of US$23.8bn at the end of the 1980s in a study by the US International Trade Commission (Sherwood, 1990). Nevertheless, despite the importance of external influences, it is unlikely that the combined pressure from Western countries alone would have produced the major changes that have taken place in the PRC unless they had been pushing on an “open door”. It is probably likely that the Chinese government acceded to Western pressure in order to further its own economic policies and gain access to Western technologies.

Finally, a further consequence of China’s “open door” policy has been the influence of different international conventions (see Table 2) and her efforts to become a member of the World Trade Organisation (WTO). Although the PRC is not yet a member, she took an active part in negotiations during the Uruguay Round of the GATT and signed the final agreement on TRIPS. Currently, the Chinese government is negotiating with the WTO to become a contracting party, but has been prevented from doing so because of the terms of entry required by the USA and other countries. Of course, there are also other barriers to China’s membership, including tariff issues and human rights concerns.

5. IP activities in the PRC

We now examine the evolution of foreign IP activities in the PRC since changes in legislation began in 1982. This is achieved using the annual statistical reports of
the World Intellectual Property Organisation (WIPO) to explore the activities of both Chinese residents and foreign-based nationals in terms of patents, designs, trademarks and utility models (WIPO, various issues). The activities of foreign-based nationals are then broken down in detail by country of origin. This data is related to trends on inward licensing observed for two countries, USA and Japan.

Before proceeding, however, it is important to note a number of important features of IP data. First, although all of the countries are signatories to the WIPO agreement and have broadly similar laws, a number of differences nevertheless prevail, as the discussion in this paper makes clear. Second, countries make significantly different use of the different forms of IP protection. France, for example, makes much more extensive use of trademarks, while Germany makes more extensive use of patents. In part, this reflects the different industrial structures and areas of creativity across countries. Third, there are some differences in the way in which similar laws are used and interpreted across countries. For example, the Japanese tend to split their inventions down into component parts and apply for a separate patent for each part, while the USA tends on balance to have much broader patents. In sum, these national predispositions, if extended to China, will distort the data collated by the relevant authorities.

As noted at the outset, foreign companies will seek patent, trademark and other forms of IP protection as a prerequisite for subsequent licensing activity. Patents are generally linked with industrial invention activity and are often the subject of technology licensing activities. Patents are also an important source of technical information that can be used in a country’s own R&D activities. There were over 440,000 patent applications in the PRC between 1984 and 1994, of which half were approved (Reuvid & Li, 1996). Trademarks are often linked with product innovation, and relate to the introduction of new and modified products. At the beginning of 1996, registered trademarks in the PRC numbered over 550,000 (Reuvid & Li, 1996). Trademarks are also often the subject of licensing activity. Much the same can be said about designs, which relate to the configuration or shape of products. Utility models are less widely used throughout the world, although a number of countries, such as Japan, have used them for many years. In general, they are aimed at more minor inventive activity (and hence are often called “petty patents”). Utility models tend to be used more as a stimulus to domestic rather than foreign inventors.

6. Trends in IP-related activity by residents and non-residents in the PRC

We now review the relative levels of resident and foreign-based (non-resident) IP activity within the PRC, as reported by WIPO. The comparison reveals very important differences between the levels of activity of residents and non-residents across the different areas of IP protection, which reflect the degree of “inventiveness” required to obtain protection. The linkages of such differences with inventiveness emerge more clearly with the passage of time, and these are unlikely to be visible given the relatively short time period of data available to the present study. In the main, the figures presented focus upon application activities (as opposed to grants),
as these give a clearer indication of the growing flows of IP into the PRC. Grant data (or equivalent for other forms of IPR, such as registrations in the case of trademarks) are affected by the speed of operation of the administrative system, but broadly show the same trends (but see Pasco, 1998). Finally, we recognise the possibility that some of the application and registration activity categorised as that of residents may have been made by foreign-invested enterprises domiciled in China (for example, by the Chinese party in a Sino–western joint venture). Limitations in the data do not allow us to distinguish such instances. The following discussion focuses on the period 1988–1995, when the majority of China’s IP legislation was enacted, although some data for 1996 and 1997 are also considered.

Fig. 2 provides evidence of the growth in patent applications. There were roughly equal numbers of domestic and foreign applications at the start of the period and, while resident applications grew more quickly than non-resident over the period 1985–1992, there was a sudden surge in foreign activity after 1992. This upsurge appears to coincide with the PRC’s modification of its patent law in 1990 and 1992, to be compatible with international practice. The net result, however, is that total applications in the PRC from all sources increased exponentially. Whatever the pattern of applications, grants to foreigners exceeded the corresponding grants to residents in every year from 1985 to 1994 inclusive, indicating perhaps the higher quality of the non-resident applications — while foreign applications formed around 50% of total applications, grants to non-residents formed about 61% of the total grants.

Fig. 3 sets out the corresponding trends in trademark activity. The first thing to note is the much higher level of trademark activity than patenting, even at the beginning of the sample period. This is entirely to be expected, as the introduction of new
legislation in 1982 enabled firms to trademark existing products and services. However, while the numbers of applications remained fairly constant during the first few years, at around 40–50,000 per annum, there was a significant rise in total applications from 1990 onwards. The second feature is the relatively small proportion of foreign applications, although numbers more than doubled from 1992 to 1994. Again, this increase appears to broadly coincide with the amendment of the trademark legislation in 1993. The smaller proportion of non-resident activity reflects the different nature of trademarks to patents and the lower “creativity” threshold associated with them. Broadly, the same picture emerges when we examine trademark registrations. On balance, taken across the period as a whole, there is little difference in the ratio of registrations to applications between domestic and foreign applicants. It should be noted, however, that, while foreign trademark activity only averages about 14.2% of the total, this is an average of nearly 11,000 foreign applications and over 52,000 foreign registrations each year, leading to around 67,000 foreign trademarks in force by the year 1994.

Design activity is shown in Fig. 4. The picture that emerges is more similar to that of trademarks than to patents, in that residents largely dominate design applications and registrations. Nevertheless, the level of foreign activity is not insignificant, and there is a major jump in design applications by non-residents between 1992 and 1995. Similar, though smaller increases in foreign registrations occurred, lagging behind the application figures. However, the design data is similar to patents in at least one respect; the ratio of registrations to applications is higher for non-residents — while foreign applications form only 12% of total applications, they form just over 18% of total registrations.
Utility models have a lower degree of inventiveness than patents, but appear to be important in the early phases of economic development and for domestic, rather than foreign inventors. The data confirm that the vast bulk of utility models applied for or deposited in the PRC were by residents rather than by foreigners. In 1995, only 312 out of a total of about 44,000 applications originated from outside of China. Fig. 5 therefore ignores the domestic versus foreign aspect and provides data on the growth in total applications and deposits over the period 1986–1995. The picture is one of major growth in the area of minor inventions, rising from just under 10,000 applications in 1986 to just under 47,000 in 1993, before falling back somewhat to the figure of about 44,000 by the end of the period. This suggests a major growth in lower-level inventive activity by China during the period following the introduction of its “open door” policy.

Finally, Fig. 6 illustrates the growth in overall IP within China. We use the partial data that are available about patents, designs, trademarks and utility models in force over the period 1988–1995. Given the scarcity of data for patents, after the first few years — where the figures are known, we have used the cumulative sum of patent grants as an estimate of the stock (adjusting this proportionally to be consistent with the one figure of patents in force available, that for 1995). The results show a strong growth in the patent stock, reaching a total of just under 20,000 by the end of the period, of which around 16 thousand are foreign in origin. These will provide a rich base for exploitation, including licensing activity. They will also serve as a source of technological information for Chinese researchers. Total designs in force show a very similar pattern and level to patents, perhaps growing more weakly earlier in the period, but more strongly later. Designs in force reach just over 20,000 by the
Fig. 5. Utility models in the PRC: applications and deposits (1986–97).

Fig. 6. IP in force in China (1985–95).
end of the period, but only about 18% (that is, just under 4000) of these are of foreign in origin. Interestingly, utility models grow much more strongly over this period than either patents or designs. By the end of the period, there are around 90,000 utility models in force. Finally, while trademark activity has not grown at such a high percentage rate as, for example, utility models, by number, they are by far the most important area of IP activity in China. By the end of the 1995, there are almost 500,000 trademarks in force. And, as we pointed out above, although only about just over 14% of these are of foreign origin, this still amounts to about 67,000 foreign trademarks in force in the PRC by the mid 1990s. All of the foreign IP, irrespective of whether it is patents, designs or trademarks, have the potential for licensing activity.

7. IP activity in the PRC by country of origin

The data presented above demonstrate the rapid growth in IP activity within China, with a significant proportion of that activity being undertaken by non-residents, and which might be the source of licensing activity. This section now turns its attention to the countries involved in IP activity within the PRC. Table 5 shows the distribution of patent flows by major country of origin, giving the proportion of the patents attributable to each country over the period 1985–95 inclusive. We noted above that patents tend to be linked with industrial inventions and are often argued to be associated with more fundamental inventive outputs than utility models or, indeed, the creative activities that underpin trademarks or designs. It is perhaps not surprising to find that Japan and the USA dominate these flows, as these two nations dominate global technology markets. Of the other industrialised countries, only Germany comes close to the USA and Japan, although the total across the European Union countries would be approximately the same magnitudes as the US figure.

Table 5 shows also the trademark flows into the PRC by the country of source, based upon the total flows over the period 1985–95. We noted above that trademark (and service mark) activity normally relates to product (or service) distinctiveness, with new trademarks often being associated with the introduction of new products and services. There is an important proviso with trademarks, however, that, when the law is changed to allow the protection of products through marks, many of the early applications and registrations will relate to existing marks. However, in the case of non-resident applicants, these products may well be new to the PRC, as it is unlikely that firms would have exported to or produced within the PRC without the existence of trademark protection. Table 5 demonstrates some similarities between the distribution of trademark and patenting activity. This is not surprising — not only are there some linkages between invention and new product development, but also countries which are more inventive in one way, may also be more creative in other ways. Note, however, that while the USA, Japan and Germany are still the top ranked countries, the distribution is more equal across countries.

It is clear from Table 5 that, in terms of design protection by country of origin, Japan, the USA and Germany are still ranked as the top three countries. Japan’s
<table>
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<th>USA</th>
<th>Japan</th>
<th>Germany</th>
<th>France</th>
<th>Switzerland</th>
<th>UK</th>
<th>Plus:</th>
<th>Others</th>
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<tbody>
<tr>
<td>Patents</td>
<td>29.04</td>
<td>29.85</td>
<td>9.93</td>
<td>5.39</td>
<td>4.22</td>
<td>3.41</td>
<td>4.97</td>
<td>13.18</td>
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<td>(Netherlands)</td>
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<tr>
<td>Trade marks</td>
<td>18.95</td>
<td>13.93</td>
<td>10.39</td>
<td>8.46</td>
<td>5.79</td>
<td>5.19</td>
<td>5.86</td>
<td>31.43</td>
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<td></td>
<td>(Italy)</td>
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<tr>
<td>Industrial designs</td>
<td>9.86</td>
<td>16.06</td>
<td>3.02</td>
<td>1.91</td>
<td>2.83</td>
<td>1.79</td>
<td>2.83</td>
<td>59.43</td>
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position at the top reflects its generally much greater domestic use of design protection than other countries. Interestingly, some new countries begin to appear in the listing. For example, Korea has just under 3% of the designs registered within the PRC. Designs are generally argued to be associated with a lower degree of inventiveness and, for countries that eventually attain sustained economic development, they are a precursor for in-house R&D activity, as in the case of Japan. A consequence of this somewhat lower level of “creativity” is that design activity is again more evenly spread across countries than patenting or even trademark activity.

8. Technology exports and licensing in the PRC

It is extremely difficult to find evidence of licensing in the PRC per se. The Japan Statistical Yearbook however, provides some information about technology exports for Japan to the PRC, at least for the period since 1985. Fig. 7 shows the resulting flows in current prices and as a percentage of technology flows to all countries from Japan. It can be seen that the flows were higher in the mid-1980s, presumably reflecting the range of opportunities open to foreign investors following the introduction of the open-door policy and the initial improvements in IP protection in China. At this stage, the PRC formed over 10% of the total value of Japanese technology exports.
flows. However, the level of flow from Japan to the PRC was much lower during the period 1987–1991, and it was not until 1992 that the flow increased significantly.

The US Bureau of Economic Analysis publishes in its *Survey of Current Business* data on royalty and fee receipts received by US firms from non-affiliate foreign parties (Anon., various issues[b]). From this, we are able to calculate for the period 1986–1998 the total received by US firms for the sale of technology (industrial processes, franchises and trademarks) under contract to China. We use the total receipts from unaffiliated concerns, less payments made under the following two categories: “books, records and tapes”, and “broadcasting and recording of live events”. Trends are broadly comparable to those for Japan. From the mid-1980s there is a gradual increase in US receipts from China, from US$37mn to US$52mn by 1989. However, in 1990 receipts fall by almost exactly half, to US$26mn. For disclosure reasons, data is not available for 1991, but from 1992 there is a more or less steady increase in receipts, rising from US$48mn in 1994 to $113mn by 1998. Given that royalty and fee payments represent a stream of income over a period of years to foreign firms, the decrease observed for the period 1989–1990 must reflect a dramatic reduction in the numbers of new Sino–US contracts entered into at this time. Less likely, it may also involve the cancellation of existing contracts. Some commentators (for example, Pasco, 1998) suggest that the Tiananmen Square incident of 1989 played a significant role in discouraging both US and Japanese firms from entering into new licensing agreements with Chinese parties at the beginning of the 1990s. Nevertheless, there has been a recovery in recent years, and the timing of this jump again corresponds with the further improvements in IP protection in the PRC (Fig. 8).

While greater market access and market size in China will have had a positive role to play, it is evident that the PRC is seeking to close the technology deficit created by years of political isolation, offering patent owners the chance to set up potentially lucrative licensing deals and alliances. Yet, for the USA, less than 2% of global receipts of royalties and fee payments are attributable to Sino–US technology licenses. This speaks to the relative unattractiveness of China as a licensee nation, compared with the industrialised countries, but also, given the sharp growth in US receipts since 1996, for its future potential.

9. Operating the new system of IP laws

Despite new legislation, there are a number of reasons to believe that companies involved with technology transfer and licensing activity in the PRC will continue to experience problems regarding IP rights. There are at least two main areas of difficulty: first, relating to the enforcement of existing laws and, second, relating to remaining differences in the law and its interpretation.

9.1. Remaining differences in enforcement

Although the judicial route has improved, with courts increasingly involved in criminal law enforcement and numerous judgements in favour of western firms
(Feng, 1997; Speight, 1998; Zheng, 1997; Zhang, 1996), commentators report a number of outstanding problems (Potter & Oksenberg, 1999; Speight, 1998). First, there is a general lack of professional training of Chinese judges and legal officials with respect to IP issues, though this is improving. Corruption and influence-peddling remains pervasive, and “outside pressures”, such as threats to judges are not unknown. Chinese judges also have no security of tenure, which makes them vulnerable to such pressure. Lawyers also report problems representing their foreign clients (Potter, 1995). There are difficulties in obtaining evidence. Foreign lawyers can only obtain physical or testimonial evidence for dispute resolution from the local Chinese courts and officials, who, unfortunately, are often reluctant to offer such assistance. Also, foreign lawyers are excluded from participating directly in court proceedings.

While it is still too early to reach firm conclusions on the effectiveness of criminal penalties and fines, it is common for compensating damages to be regarded as inadequate (Potter & Oksenberg, 1999). Furthermore, even where the courts reach a clear and appropriate decision, it may be difficult to enforce a judgement (O’Connor & Lowe, 1996). There are few penalties for non-enforcement of court rulings (refusing to obey a court order is not a crime in China) and there is a lack of infrastructure to enforce the rulings. Additional difficulties arise from differences in the understanding and interpretation of the law between the legislative tiers (Fig. 1). The courts in

each tier exercise their power independently, and the law and regulations enacted by them are not always consistent. It is not unusual for one court to fail to co-operate in the enforcement of the judgements made by higher and similar level courts. Few rules and guidelines are in place to manage the inconsistencies and conflicts that occur. Together with a prevalence of strong protection of local interests and the increasing politicisation of the Chinese People’s courts, on balance, suspicion is strong that the existing judicial system cannot adequately provide IP-related resolutions fairly and effectively (Potter, 1995; Potter & Oksenberg, 1999).

In recent years, the non-judicial track has therefore been preferred by firms, and this accounts for approximately two thirds of patent infringement cases, for around 95% of trademark cases and most copyright cases. Nevertheless, weaknesses in the non-judicial track have also been highlighted (Potter & Oksenberg, 1999). First, arbitration commissions and administration bodies tend to lack adequate numbers of staff with appropriate IP training. Although this issue is being addressed by recruitment of top level students and foreign training, lack of resources for adequate research and analysis of cases remains a serious shortcoming. Second, it is common for disagreements and contradictions to occur between administrative agencies and between them and the courts with regard, for example, to the interpretation of the law, judgements made and their respective policies towards IP and its protection (Potter & Oksenberg, 1999).

Although, to some extent, these conflicts are more political and institutional than legal in nature, they impose considerable impediments on the progress of an adequate and efficient dispute resolution system in China. Greater macro-level co-ordination is required from government, as is greater co-operation and co-ordination between the judicial organs and administrative bodies, in order for IPR in China to be better protected and enforced.

9.2. Remaining differences in the law

There remain a number of anomalies in Chinese law compared with that of most industrialised countries that will be viewed with concern by western firms looking to license technology into China. The most important concern the protection of IP relating to pharmaceuticals, software, trademarks and integrated circuits (ICs).

Many foreign pharmaceutical companies thought that they were protected by the Chinese patent law of 1993, which was intended to cover patented pharmaceuticals from countries that had entered bilateral IP agreements with the PRC (Anon., 1988). The patent law explicitly states that third parties are not able to obtain approval from the national or municipal departments of health for the manufacture or sale of a drug without the prior consent of the foreign owner. However, a conflicting notice was issued by the State Pharmaceutical Administration in 1994, allowing Chinese companies to apply for approval to make and sell drugs during the period that patent protection is pending. Thus, Chinese companies have been able to utilise (and apply for approval to use) the information disclosed in China’s Patent Gazette, before protection has been granted. A number of US companies have been affected, including Eli Lilly, Merck and Novartis (Anon., 1988).
The adequacy of protection of computer programmes has been a major area of dispute between the PRC and other countries, particularly the USA. Two main avenues of protection have generally been adopted — copyright and patents — and practice differs between countries. The patent route appears to offer stronger protection and the USA has made a significant use of this form of protection. Note that, while there is no specific TRIPS ruling, protection under patent law is not ruled out for contracting countries (Article 27.1). The PRC also allows patents for computer programmes, but only under two conditions: first, the “invention” must have technological effects; second, the “invention” must be a complete scheme. But, the two conditions are ambiguous; for example, technological effect is extremely difficult to judge at the patent application stage. Thus, differences in the extent to which the two routes are available, plus differences in the legal details, will clearly form a source of continuing dispute. However, it is fair to say that such differences in the protection of computer software remain a key issue for many countries, not just for the PRC.

Despite the introduction of trademark legislation into the PRC, there remain important differences with the TRIPS (Article 15) and WIPO (Paris Convention) regulations. Of particular importance is the fact that the PRC does not currently follow Article 21 of TRIPS, which states that contracting parties should have the right to decide the conditions under which a trademark may be licensed or transferred, and compulsory licensing is forbidden. The threat that compulsory licenses might be imposed in China will serve to dissuade many firms from entering the Chinese market. Also, although the PRC has recently announced regulations relating to well-known trademarks, these are not sufficiently specific to conform to TRIPS. As a result, different provinces of the PRC have different standards for the evaluation of well-known trademarks (Bosworth & Yang, 1999), which will be of concern to trademark owners.

In principle, trade secrets are protected under (anti-) unfair competition law in the PRC. In practice, the loss of competitive advantage through trade secret leakage remains a significant problem within the PRC. It was recently reported that around 70% of enterprises experienced problems of trade secret leakage (Liu, 1996). The principal problem appears to lie in the greater opportunity in recent years for Chinese workers to change their employers, resulting in both intentional and unintentional disclosure of information. A further problem is the leakage associated with the disclosure that takes place in various application, product inspection and registration procedures, with respect to government departments. More specific legislation would not only symbolise the implementation of anti-unfair competition law in the PRC, but, again, also bring China more closely in line with respect to TRIPS.

The final example of differences between the PRC and Western countries concerns the protection of IC topographies. ICs form a particularly important example, because, to date the PRC has not enacted any form of protection in this area of technology. Yet, ICs are an important element of technology transfer, in terms of both their production and their embodiment in other products. There is every incentive for the PRC to enhance the development of this area through technology transfer, trading, collaborative research and development. But, to do so, it is imperative that
it establishes IP protection in this area. Similar concerns have also been voiced regarding, for example, the protection of plant and seed varieties in China.

10. Conclusions

This paper argues that IP laws and their enforcement play a crucial role in the process of economic development. Without such laws, the incentive for trade and FDI may be severely reduced, insofar as the associated product can be copied by the importing or host nation. The potential barriers that an absence of appropriate IP laws and weak enforcement impose on technology transfer through licensing and FDI are even more significant. This paper has shown that a natural corollary of China’s “open door” was the introduction of IP laws. This was a very major development, given the dominant role that Confucianism and legalism have played in recent Chinese history and culture. The resulting introduction of a raft of IP laws has clearly given rise to a rapid increase in the flows of patent, trademark and design activity to the PRC by Western countries. It is also clear that the improvements to the legislation introduced in the early 1990s produced a further jump in IP flows. All of the foreign IP, irrespective of whether it is patents, designs or trademarks, have the potential for licensing opportunities. However, an investigation of Japanese technology flows and of US receipts from licensed technology sales suggests that the beginning of the 1990s witnessed a decrease in the transfer of technology under license from these countries to China, primarily for political and administrative reasons. A recovery in these flows has occurred from the mid-1990s onwards. Nevertheless, a broad review of the legal system and the mechanisms for enforcement reveal a number of major remaining issues which will need to be resolved if China is to continue to attract increasing volumes of IP, to realise its potential for technology transfer and licensing. It is clear that China still needs to do much more in terms of offering adequate IP protection to foreign inventors. The pace of recent reform, however, is likely to be maintained, given the importance attached to IPRs as a vehicle for trade and investment. The accession of China to the WTO, and the automatic adherence to the provisions and minimum requirements of TRIPS, will do much to alleviate the concerns of Western IPR owners regarding IP protection and enforcement in the country.

References


