

# Enforcing Intellectual Property Rights in Weak Appropriability Regimes

## The Case of de Facto Protection Strategies in China

Marcus M. Keupp · Angela Beckenbauer · Oliver Gassmann

### Abstract:

- Many emerging economies are characterised by weak appropriability systems and absent legal systems to punish imitators. This places foreign firms' intellectual property rights at risk, because existing appropriation methods, such as patents or secrecy, cannot function effectively. This concern especially applies to China, the empirical context of this article. Such adverse conditions force managers to devise new strategies to safeguard their firms' intellectual property rights. Yet no evidence describes whether strategies exist, which forms they take, how they have evolved or how they get implemented.
- This article addresses this knowledge gap and explores strategies that managers have developed to achieve de facto protection, despite China's weak appropriability system. The analysis systematically explores 13 cases of foreign firms with wholly owned subsidiaries in China.
- The findings confirm that de facto strategies exist, describe how they work and detail how they were achieved. The findings suggest implications for both managers and academics.

**Keywords:** Intellectual property rights · China · Appropriability regime · De facto protection strategies

---

**Received:** 20.06.2007 / **Revised:** 09.11.2008 / **Accepted:** 12.04.2009 / **Published online:** 16.01.2010  
© Gabler-Verlag 2010

---

Ass. Prof. M. M. Keupp (✉) · PhD Cand. A. Beckenbauer · Prof. O. Gassmann  
Department of Business Administration, Institute of Technology Management  
University of St. Gallen, St. Gallen, Switzerland  
e-mail: marcus.keupp@unisg.ch

## Introduction

Emerging economies often contain weak appropriability regimes, such that the country's legal system provides little or no effective protection for the intellectual property rights (IPR) of a foreign firm, and the enforcement of a foreign firm's IPR is difficult if not impossible.<sup>1</sup> In such countries, firms from more developed economies often cannot protect their IPR using the same appropriation measures that they would commonly use at home.

This concern especially applies to China, one of the most risky environments with regard to IPR protection, especially for enforcing foreign firms' IPR in markets and before the courts (European Commission 2004; United States Trade Representative 2005). Yet many foreign firms have invested in business operations in China, including research and development (R&D) activities (United Nations Conference on Trade and Development 2005). Were the impact of China's weak appropriability system truly disastrous, foreign firms would have exited the market, either voluntarily or because of the loss of vital IPR and the subsequent loss of competitive advantage. Yet this exodus seemingly has not happened.

In accordance with recent exploratory contributions (Anand and Galetovic 2004; The Swiss-Chinese Survey 2006), we presume that managers create strategies that can protect their firms' IPR in China, despite the shortcomings of IPR enforcement. We refer to such strategies as *de facto protection strategies*, defined as follows: *A strategy crafted by local managers of a foreign firm, active in an emerging economy, that successfully can protect the firm's IPR without using the legal system, formal litigation or lawsuits.*

Virtually no analyses investigate if these strategies truly exist and how they might be implemented. Extant theory about how firms protect IPR remains limited to samples from developed economies, such as the United States (Cohen et al. 2000; Levin et al. 1987), Japan (Cohen et al. 2002), Germany (Blind et al. 2006) and Switzerland (Harabi 1995). To the best of our knowledge, no systematic discussion considers how firms protect IPR in emerging economies in which the actual enforcement of IPR is difficult, if not impossible. Yang et al. (2004) focus on reactive strategies to fight product piracy if counterfeits have appeared in the market, but no research analyses which, if any, measures firms might take to *prevent* IPR infringements.

This article represents an attempt to shed light on these questions. Specifically, we attempt to (1) develop a theoretical understanding of how a firm can protect its IPR in an environment in which the enforcement of IPR is difficult or impossible, (2) inform managers about *de facto* strategies and how they are applied and (3) discuss how *de facto* strategies identified in the specific context of China might apply to other emerging economies. Our paper proceeds as follows: We first provide some background about known appropriation mechanisms and why they seem unlikely to work in China. We then explain the methodology we use for our exploration and feature our results with content analyses of interview data that reveal firms' *de facto* protection strategies. Finally, we discuss the implications of our findings.

## Appropriation of IPR in Developed Versus Emerging Economies

A firm can appropriate economic benefits from its innovations through formal measures (e.g., patents, utility patents, trademarks, industrial designs, copyrights) or complementary measures, such as moving quickly down the learning curve, gaining a head start on commercialisation, achieving superior sales and service (complementary assets), ensuring secrecy through legal mechanisms (e.g., nondisclosure agreements) or undertaking strategic legal moves (e.g., threatening competitors with lawsuits).

Firms often use patents, which grant the innovating firm the exclusive right to commercialise its innovations, to appropriate economic rents from innovations. To ensure the enforcement of these exclusive rights, a strong legal system must, through a credible threat of high compensation payments in the case of patent infringements, deter competitors from imitating. The actual value of a patent is essentially unknown until it gets effectually defended in court. Patents legally can be ‘invented around’ and may provide little protection, because the legal requirements for upholding their validity or proving their infringement are high. Thus, holding a patent does not totally prevent rivals from entering a market. Moreover, in most industry sectors, patents do not confer perfect appropriability. In these sectors, technology moves so fast that patents, which require significant lead times for filing and defending, seem almost irrelevant (Mansfield 1981; Mansfield 1986). A recent meta-analysis of five empirical studies shows that four rank patents low in terms of their perceived effectiveness. Except in the chemical and pharmaceutical industry, patents are not the preferred means of appropriation (Sattler 2003). In addition, the use of patents has changed from a mechanism of appropriation to a form of strategy, such that patents represent portfolios of ‘bargaining chips’ that firms use to block the innovations of competitors (Granstrand 1999; Hall and Ziedonis 2001).

If patents are mostly strategic, complementary mechanisms must take over the appropriation function. These mechanisms include moving quickly down the learning curve, exploiting lead time advantages to stay ahead of imitators, using complementary assets (e.g., complementary sales and services) to offer better customer satisfaction than imitators can, using secrecy enforced by nondisclosure agreements and special clauses in employment contracts to keep employees from whistle-blowing technological secrets to competitors and employing strategic legal moves against imitators, such as retaliating by threatening lawsuits and compensation payments. In industries such as semiconductors and computers, the advantages of a head start, which include setting up production, sales and service structures and moving down the learning curve, appear far more effective than patents. Finally, to protect product processes, most firms prefer secrecy over patents (Arundel and Kabla 1998; Mazzoleni and Nelson 1998; Teece 2002).

Yet neither patents nor complementary measures work well as appropriation mechanisms in an emerging economy such as China. China formally has passed IPR laws, joined all major international IPR-related conventions and become a member of the World Trade Organization, which obliged it to abide by the TRIPS (Trade-Related Aspects of Intellectual Property Rights) regulations. The major Chinese laws pertaining to IPR are the Trademark Law (1982), Patent Law (1984) and Copyright Law (1991). China also has joined the Paris Convention for the Protection of Industrial Property (1985), the Madrid Agreement on the Registration of Marks (1989), the Berne Convention for the Protection

of Literary and Artistic Works (1989), the Universal Copyright Convention (1992) and the Patent Cooperation Treaty (1994). Despite this record, China barely enforces these existing laws, which results in a paradox: Despite the formal presence of IPR laws, a foreign firm's IPR is difficult to enforce in China.

We believe that China provides a drastic example of the seemingly paradoxical effect that results when a state appears interested in passing IPR laws while simultaneously showing little interest in enforcing them.<sup>2</sup> Previous research further suggests that this effect relates tightly to the level of economic development.

In developed countries, IPR laws protect a highly developed stock of knowledge and technology against domestic and foreign imitation. Strengthening patent rights stimulates innovation (Watal 2000), and firms rely on the courts to enforce the law and uphold the validity of IPR protections (Jaffe and Lerner 2004). In an emerging economy however, this picture is very different. These countries must manage the difficult problem of encouraging the inflow of foreign technological knowledge, to help domestic firms benefit from technology diffusion, while also reassuring foreign firms that their IPR will be protected. We believe this dilemma leads to stronger IPR *legislation* in an emerging economy but ineffective *enforcement* of this very same legislation.

Stronger IPR legislation should attract foreign direct investment (FDI) and thus stimulate economic development. In addition, strengthening IPR legislation has a positive effect on international trade (Maskus and Penubarti 1995), licensing and exports (Smith 2001; Park and Lippoldt 2005) and economic growth (Gould and Gruben 1996; Park and Ginarte 1997). Countries that improve patent protection benefit most from the transfer of foreign technology (Mowery and Oxley 1995). Thus, strengthening IPR legislation seems a promising strategy for an emerging economy to attract foreign investors.

However, it seems less clear whether the subsequent *enforcement* of this legislation benefits the emerging economy as much. The benefits of stronger IPR legislation may be offset by the costs of enforcement, such as higher prices of information products, foreign exchange outflows, job losses, reduced domestic production of derivative information goods and administrative costs (Correa 1995; Primo Braga 1989, 1990). Furthermore, because developing countries tend to perform adaptive or imitative R&D, enforcing foreign IPR increases the cost of technological inputs and reduces their supply, which limits the ability of local agents to learn by imitation. To the extent that enforcing IPR restricts this ability, developing countries cannot grow to become world-class innovators and competitors, because they need some technological base or skill set as a foundation (Allred and Park 2007).

If an emerging economy must pay to enforce foreign firms' IPR, which means higher prices for consumer goods and the transfer of patent royalties and license payments overseas, they receive little incentive. If the switch to innovative activity in a particular industry depends on an accumulated stock of knowledge, enforcement of foreign patents in China could delay the onset of innovative activity in that industry (Pasco 1998; LaCroix and Konan 2002). We therefore argue that beyond the often-quoted difference between the Confucianist ideal of *li* (moral) versus *fa* (the law), the difference between IPR legislation and enforcement makes it difficult for a foreign firm to protect its IPR in China. In turn, it seems questionable whether formal and complementary measures provide effective protections for a foreign firm's IPR.

Foreign firms also are unlikely to win patent lawsuits, because the institutions of the law in China are plagued by nepotism and corruption, politicisation of courts and judges, discrimination against foreign business, ever-changing laws and local protectionism (Cheng 1998; Feng 1997). The absence of a strong legal system particularly implies that patents are not enforceable, which invalidates their strategic use as bargaining chips.

On the contrary, applying for patents in China could facilitate local illegal imitation, because a patented product would be regarded as profitable and thus targeted for imitation in an environment in which social recognition of IPR is weak (You and Katayama 2005). It is likewise questionable whether complementary mechanisms can achieve effective IPR protection; they implicitly are built on the assumption of a strong appropriability system and a legal system that credibly threatens imitators and effectively sanctions those who infringe on treaties. This assumption clearly is rather unrealistic in the context of emerging economies, especially China.

First, moving quickly down the learning curve to stay ahead of imitators and exploiting lead time advantages likely works only when these advantages remain hidden from imitators, which is often not the case in China. Whole factories often are reproduced from illegally transmitted blueprints, such that the original firms do not know about the replicas until customers tell them. Products may be re-engineered, without any intervention by the legal system. Patents registered with the Chinese State Intellectual Property Office often provide imitators with a library of technological information. Moreover, foreign firms in China generally employ many local Chinese, many of whom think very entrepreneurially and are eager to start their own businesses to 'get rich quickly', even if doing so implies unscrupulously infringing on the foreign firms' IPR. Thus, business and production processes are prone to observation, with experience and tacit knowledge transmitted easily to potentially disloyal Chinese employees (Kambil et al. 2006).

Second, using complementary assets such as superior sales or manufacturing services seems promising only if a large quality gap exists between innovators and imitators. However, if knowledge about vital business processes spills over to Chinese imitators (whether legally or illegally), knowledge about how to offer complementary services also may spill over quickly. Over time, imitators likely can imitate even complementary assets, to the extent that customers no longer perceive a quality gap, which invalidates the long-term use of complementary assets.

Third, using secrecy, enforced by legal means such as nondisclosure agreements, to protect IPR works only if the legal system can guarantee effective enforceability, which clearly is not the case in China. For the same reason, using strategic legal moves against imitators is unlikely to work.

Because this situation shall change only gradually, during China's progression towards a developed country, we believe it is paramount for managers to devise strategies that enable them to protect (or even enforce) IPR *by themselves*. The state is unlikely to show a strong interest in protection at the current stage of China's economic development. This presumption rests at the centre of our empirical exploration.

## Methods

To explore how strategies are crafted, the close observation of managerial work often provides rich and enduring insights. In-depth studies are not only valid in themselves but also provide vital complements to large-scale studies typical of traditional strategy performance research (Johnson et al. 2003). Moreover, extant theory provides little guidance for identifying such strategies and approaches, so a qualitative, exploratory approach is appropriate. For such inductive approaches, a sample size of 4–10 cases has been suggested (Yin 1989; Eisenhardt 1989).

We travelled to China and collected data about 13 wholly owned subsidiaries of foreign firms, interviewing senior managers of these subsidiaries with in-depth, semi-structured interviews. Specifically, we inquired about how their original approaches to IPR protection had worked during their initial interactions with the Chinese societal context, what IPR infringements the firms had suffered, how managers had crafted de facto protection strategies for IPR protection (if they had), how these strategies worked and which elements they comprised. Appendix A details our approach to sampling and data collection, as well as our methods to ensure the reliability and validity of interview data. The interviews were not retrospective narratives of past actions but rather reflections on the current, ongoing actions of the firms' managers in China who, in their daily interactions with the Chinese societal context, crafted and continue to craft de facto protection strategies to protect their firms' IPR. Thus, inaccuracy due to hindsight—a potential validity

**Table 1:** Descriptive Data

Case ID	Business segment/industry of the firm in China	Elements of the value chain covered by Chinese operations
A	Industrial chemistry, plastics	Production, sales, R&D
B	Power technology, automation Technology	Production, sales, R&D, services
C	IT hardware and software	Software development, sales, R&D
D	Nonwovens	Production, sales
E	Fragrance and flavour industry	Production
F	Pharmaceuticals	Production, R&D, sales
G	Textile machines	Production, sales
H	Conveyance, shipping and packaging of fine arts	Logistics, packaging, shipping
I	Industrial engineering, construction of plants	Production, distribution and services
J	Electronics industry	Production, development, R&D, distribution, services
K	Electronics industry	Production, development, R&D, distribution, services
L	IT, software for optimisation of industrial processes	Sales
M	Sanitary technology	Sales, production, localisation modifications

threat when interviewees recall past events and subjectively modify them—is not an issue for our research. Descriptive data about the 13 cases appear in Table 1.

## Findings

### Detailed Analysis of the de Facto Protection Strategies

The interviews offer strong support for our presumption that managers have developed de facto protection strategies for their firms' IPR. Table 2 provides a comprehensive exposition of these strategies, which reveals that there is not only 'one' or a 'best' de facto protection strategy. Rather, a multifaceted spectrum of strategies exists, which are not mutually exclusive, and most firms rely on more than one.

We describe and analyse in detail the de facto protection strategies, which we named during our analysis of the interview data to reflect the main idea of the respective strategy. However, they were not explicitly labelled with these names by the interviewees.

#### *'Technological Specialisation' (Cases A, D, H, J, L)*

This strategy attempts to make imitation impossible by raising the degree of complexity of the product and/or the process technology, such that imitation would take a long time, be so costly as to match that of innovation or be simply impossible because of the lack of adequate knowledge needed for imitation. The interviewee for Case A provides a clear picture of this strategy:

In general, the government don't do a very good job at protection of IPR in general. However, in the line of chemicals, if the chemical process is relatively complicated, they cannot, you know, it's pretty difficult for them to try and copy it. With relatively difficult products, I guess there is a natural barrier [to imitation]. (...) The technology that we put into the market in China is technology that we feel can be somehow uniquely tied up only with our product capabilities, so it's a combination of product and service which cannot be easily replicated.

In the same vein, in Case D, the firm's competitive advantage is based on a combination of technical expertise and experience that cannot be easily copied. Case H uses specialised packaging technologies that are hard to replicate, and Case J represents an extreme example: Managers do not even attempt to protect their proprietary technology with local patents. Instead, the products are composed of hundreds of modularised components with a high degree of technological complexity. Even if a competitor succeeds in copying one component, it probably cannot replicate all the other components needed, manage the interface problems in combining them or possess the process knowledge to arrive at the final product. Thus, for Case J, IPR protection is 'a non-issue'. If these managers had applied for a local patent for every module, they would have provided every potential imitator with a catalogue of the technological specifications of every module and the interfaces by which they interact, because the full texts of patents are openly accessible (not only in China but in every patent system).

**Table 2:** Exposition on the de Facto Protection Strategies

<b>De facto strategy</b>	<b>Cases</b>	<b>Rationale and functionality</b>	<b>Suitable for...</b>	<b>Benefits</b>	<b>Risks</b>	<b>Contingencies and limitations</b>
Technological specialisation	A, D, H, J, L	Keep products complex, modularise components.	Complex, knowledge-intensive goods.	Imitators' costs rise beyond the cost of buying the original.	Fragmentation of knowledge is key to protection.	Suitable to fight imitation, but not innovations by domestic competitors.
De facto secrecy	A, E, F, H, I, J	Keep valuable knowledge restricted to very few expats, do not document knowledge.	Products and processes that require highly tacit knowledge.	Almost perfect protection unless imitator can access critical knowledge.	Staff entrusted with critical knowledge need to be absolutely reliable.	Need for reliable staff. Limited possibility to store and transfer knowledge.
Internalguanxi	C, G, I, K	Make use of the importance of personal networks for the Chinese. Integrate them in the firm's 'family'.	Firms with a high proportion and importance of indigenous staff.	Fighting in-house disloyalty at low cost. Good chance for long-term commitment of local staff.	May not always be ethical. If performed wrongly, staff may behave disloyally.	Excellent understanding of China's societal context needed.
External guanxi	B, F, H, K	Convince Chinese decision-makers that your IPR should be protected because you are 'an old friend'. Team up with Chinese officials in administration and in the customs.	Firms willing to invest in building and grooming long-term relationships with officials.	Very robust means for protection. China's administrative and party officials and the customs have powerful instruments to protect the firm's IPR if it is 'an old friend'.	Chinese officials may be ousted by rivals so that the relationship is lost. Some officials may pursue hidden agendas.	Requires good citizenship, considerable cultural competence and patience to be awarded the status of 'an old friend'.
Educate the customer	D, G, M	Turn counterfeiters into your primary marketing device: Spread your logo and brand name while demonstrating the poor quality of imitators' counterfeiters.	Firms that produce for mass markets and firms whose customers are private individuals.	Free advertisement, increase of your brand's reputation, Chinese are 'educated' that to buy counterfeiters doesn't amortise in the long run.	Works only as long as there is a large quality gap between original and counterfeit products.	Strategy is of little use if counterfeiting is not the primary problem.



The firm in Case L uses a specialisation advantage: It sells its software applications only bundled with the specialised products of a large software supplier and reserves an encrypted software ‘key’, without which the product is useless. The customer receives this key only after documenting a purchase of the original software bundle. Because the firm receives its royalty payments directly from the large partner, its exposure to risks from lost royalty payments through software counterfeiting is very low. Moreover, the encrypted key contributes to the technological specialisation of the bundled product.

These findings correspond well with conceptual ideas from economic theory. For a wide range of complex, high-technology goods, such as chemicals, drugs, electronics and machinery, the costs of imitation average 65 percent of the costs of innovation; therefore, the costs of complexity can be interpreted as a tax on imitation (Glass and Saggi 2002).

Comparing this argument to our cases, we note that the firms’ technological specialisation raises the imitator’s cost, so that imitation, even if technically possible, becomes economically unviable. Our findings also corroborate the conceptual idea that the tacitness, complexity and ambiguity of resources create barriers to imitation; despite the easy duplicability of single components, experience-bound specialised knowledge about how different technologies relate provides a barrier that inhibits imitation (Reed and DeFillippi 1990; McGaughey et al. 2000). Thus, we can resolve the paradoxical finding that the firms in Cases A and J are developing very complex, high-tech products despite China’s weak appropriability system.

#### *‘De Facto Secrecy’ (Cases A, E, F, H, I, J)*

We choose the label *de facto* secrecy to highlight the core of this protection strategy; however, this secrecy is not enforced by legal means, such as nondisclosure agreements. Managers who have crafted this strategy want to stop the outflow of sensitive IPR from the unauthorised appropriation of documents, blueprints and technical description by local employees. The basic idea is simple: Do not document any important information in writing. Although these firms transfer technology to China, they never disclose that technology in such a way that any imitator could benefit from it. Contrary to patents, in which text and formulae are openly accessible, *de facto* secrecy strategies try to keep complete knowledge secret or reserve a ‘key’ of tacit, specialised knowledge, without which the final product is not useable. Thus, the strategy is not just about keeping knowledge tacit but instead has several facets. One facet keeps the ‘big picture’ of the technology hidden, so that any potential damage is restricted to a module of the problem. In this vein, the managers of Case A state,

once you are in court against a local company, it’s almost impossible to win, while the whole process takes up a lot of resources. Now if we are cooperating with local companies on an R&D project, we only give them a small part of the problem, and once they have solved this, we integrate all those parts into a whole solution. This should prevent technologies and innovations to leak out even when we’re working together with local companies.

This *de facto* secrecy also extends to Case A’s own subsidiaries in China: ‘Our units in China do not have total access to information, especially not to key data and technology’.

Another facet of this strategy avoids disclosing the key components of product compounds, similar to Coca-Cola's famed protection of its recipe: The brand name and logo are protected trademarks, but the formula for the beverage remains solely in the heads of a few chemists. As the managers of Case A state,

whenever formulation is involved in the product, we tend to try to keep the formulation within a small group of people so we don't exchange information freely. If no formulation is required in the products, we actually make the process information as confidential as possible.

Similarly, the managers of Case E report a dual approach to protecting proprietary knowledge. First, they patent individual molecules. Second, they do not disclose the recipes for the complex compounds (generated by combining several dozen individual molecules) at all: *'With gas chromatography and mass spectrometers, formulas can be analysed, but captive chemicals are a good protection against copies'*. In the same manner, the manager of Case F notes: *'It makes sense to patent the molecules, but not the procedures of making the molecules'*. Although Cases A, E and F all function in the chemical and pharmaceutical sectors, de facto secrecy is not limited to this industry; the competitive advantage in Case H largely derives from the firm's technological knowledge about packaging fine arts. Managers explicitly order that no written information about these packaging technologies may be distributed outside of Europe. Even local Chinese employees who work with the technology fly to Germany to learn how to use it, and the instruction relies on learning-on-the-job and practice only, without documentation, user manuals, or other written materials. Furthermore, the managers in Case I report that the only way they can protect their IPR from appropriation by state-owned enterprises is through the *'release of results only, no calculations or further explanations; patent applications should be as useless as possible for imitators'*.

Our results are consistent with the finding that 'observability' is the only technology characteristic that significantly increases the hazard of imitation (Zander 1991). De facto secrecy significantly reduces this hazard, because knowledge that is fragmented or never documented can be neither easily observed nor copied. Of course, this strategy also has one important limitation: Those who know about the secret knowledge need to be trustworthy.

#### *'Internal Guanxi' (Cases C, G, I, K)*

Guanxi refers to the Chinese way of establishing networks of relationships for social interactions. Significant threats to IPR protection may emerge from inside the firm, because Chinese employees conventionally do not show great loyalty to their employers. However, some managers either build trusting relationships with their employees or use the susceptibility of Chinese employees to guanxi issues to exert pressure on them. For example, in Case C, managers report that standard measures such as legal contracts can be supported by long-term education and training. In China, reminders about particular issue must be repeated systematically, or Chinese employees will think the issue is not 'on the agenda' anymore and will ignore it. To achieve successful IPR protection in the firm's internal sphere, frequent reminding and training is necessary: *'We train and*

*educate employees to really understand why the protection of IP is so important and to respect that if IP is given to third parties, it will hurt the company in the first way, but that it also has a retroaction to every single employee*'. Similarly, the managers of Case L claim that *'human resource management is key to the protection of IPR'*. In Case J, the firm has introduced a system of monetary and non-monetary measures that attempt to make Chinese employees feel recognised as an important part of the firm's network, which causes them to 'feel integrated' and reduces the incentive to reveal the firm's technology to competitors.

Whereas these managers rely on employees' voluntary cooperation, the managers in Cases I and K depend on personal networks as a means to exert pressure. If they can identify an employee who has disclosed IPR without authorisation to competitors (as has happened several times), the managers force that employee to talk to the competitors in the company's name and issue a threat that the firm will retaliate. The employee becomes isolated by his or her own Chinese network, treated as a traitor, which leads to a breakdown of the personal network. This prospect is fearful for most Chinese, whose society is based on networks of personal relationships that are paramount in personal career paths (Luo 2000). Consequently, all employees of these two firms now know what will happen if they disclose any IPR, which makes them very likely to abstain from such behaviour.

The first facet of internal *guanxi*, building trust, confirms that a foreign firm's level of trust towards host-country employees relates positively to those employees' loyalty (Child and Möllering 2003). If employees perceive that the firm appreciates its relationship with them, they are more likely to display loyal behaviour. Thus, managers who employ the strategy of internal *guanxi* make use of China's dependence on social relationships to protect their firm's IPR. In contrast, the second facet relies on mistrust, which makes it a classic example of a principal-agent relationship. Although personally threatening employees with the loss of their personal network may be questionable from a business ethics perspective, it is, according to the managers of Case K, effective in preventing the outflow of IPR. These findings also represent a first inquiry and some preliminary answers regarding another research gap (Weldon and Vanhonacker 1999), namely, how foreign firms in China can build loyalty among employees and thus prevent the loss of IPR.

#### *'External Guanxi' (Cases B, F, H, K)*

Whereas the preceding strategy focussed on the firm's internal sphere, this strategy aims at establishing good relationships with firm-external official bodies and institutions that formally may have little to do with IPR protection. Yet the *de facto* power of these bodies may make them a lot more effective than the legal system when it comes to IPR protection, so firms often are eager to establish strong relationships with them. Through these relationships, they might win the status of 'an old friend', such that these bodies treat the foreign firm as their protégé and actively pursue IPR infringements.

The managers of Case B invite Chinese legislators and local government representatives to regular meetings of the local 'legal commerce community' it sponsors to share information. Similarly, the managers in Case K offer free 'IP academies' and seminars at Chinese universities and maintain tight contacts with local government officials and

customs officers. The firm's explicit goal is to become more known and 'networked' in the local government. Similarly, in Case F, the managers note:

In case an IP violation or counterfeits are detected, we alert the government. Ideally, the governmental agencies will take over the matter and handle the violation. It is in the interest of the firm as well as of society to collect the counterfeits and withdraw them from the market, as they can do harm to potential customers of the company. In general, Chinese authorities seem to invest much effort to tackle the problem of counterfeit products for the safety of customers.

However, this quick action is only possible because these managers have established relations with the respective governmental bodies over the years. The managers of Case H similarly have built relationships with high-ranking Chinese customs officers to fight indigenous firms that pretend to be sub-contractors and abuse the firm's corporate logo, brand names and trademarks. When the works of art that the firm in Case H conveys arrive at either airfreight centres or harbours, customs officials can intercept indigenous firms directly and at little cost to the firm. Managers inform the customs officers several hours before an expected shipment arrives. This strategy is highly efficient, because the only alternative would be a lawsuit, whose outcome would be uncertain, while the shipment in China already would be lost to the fraudulent competitor. Because this firm needs to protect its IPR both locally (at the place of import) and quickly (as soon as the fraudulent competitor tries to take the shipment), its good relationships with the customs officers provide the most effective means to protect IPR.

However, the limitations of this strategy emerge clearly in the experiences noted in Case I. China's economic organisation is far from a free market system, and state-owned enterprises still play important roles. The main customers for the firm in Case I are such state-owned enterprises, though interactions require intermediaries that have a reputation for copying the firm's products and processes. The managers of Case I somewhat pessimistically characterise themselves as 'powerless', because the government itself has an interest in technology transfer to China, so in this case, external *guanxi* would be useless.

These results corroborate the finding that the traditional and preferred means of dispute resolution in China consist of less confrontational processes such as consultation, mediation and arbitration. These processes tend to be far less complex than a judicial route, help repair relationships between the parties and, compared with litigation, are more flexible and less costly (Bosworth and Yang 2000). Again, China's prioritisation of social relationships determines the strategic behaviour of these firms.

Our findings also exemplify the power of the administrative arm of China's legal system compared with its judicial arm. Chinese customs have the power to act against IPR infringements, without lengthy and uncertain court trials. The State Council's order of protection of intellectual property, issued in May 1994, authorises Chinese customs to protect IPR related to articles imported into and exported from China, including patents, trademarks and copyrights. A firm may record its rights with the relevant customs authorities (for a discussion of the role of Chinese customs, see Asia Law & Practice 1995), so customs becomes an especially powerful agent in the Chinese legal system. However, to build relations with customs makes sense only for firms that engage in trade, shipment

and sales activities. Such relationships would not be of use, for example, if Chinese competitors or disloyal employees appropriated technological knowledge without authority.

*'Educate the Customer' (Cases D, G, M)*

This strategy seems somewhat counterintuitive. Managers who deploy it do not aim to counteract counterfeits of their firms' products. For example, they do not sue counterfeiters in courts, because the costs of litigation would far exceed expected compensation payments. Nor do they attempt to stop the counterfeiting by any other means. The managers in Case D explain the rationale behind this seemingly irrational behaviour: 'the quality of similar or copied products is often minor, and customers normally do not buy the cheaper product more than once. (...) There is no real threat to our business as long as local companies offering similar products are small. However, concentration processes of local companies are very carefully monitored'. That is, the managers take advantage of a learning effect that influences Chinese customers of counterfeiters. Most counterfeits offer poor quality, so the customer learns over time that the more expensive but high-quality original product will better fulfill demand than the low-cost, low-quality counterfeit. In addition to relying on this learning effect, the managers in Case G offer additional benefits to customers who buy the original: 'we restrict our services exclusively to original machines. We also give quality guarantees to satisfy customers of original products. We do not actively search for copied products; usually the sales and service people get feedback from customers that counterfeits exist'.

An extreme example of this strategy occurs in Case M. These managers have developed a method to turn the counterfeit products into an 'advertisement for the original product'. The firm produces cleaning products for individual households and relies on a competitive advantage of design and good quality. Counterfeits appear on virtually every street corner, so pursuing them would be not only economically unviable but also practically impossible. The poor quality counterfeits usually break after months or even days. Annoyed customers, who know they bought a counterfeit, then approach the firm to purchase an original product. Thus, the counterfeits serve to distribute the brand name in Case M, while also advertising the better quality of its products.

A broader analysis of these findings reveals two additional aspects. First, this strategy seems viable as long as competitors are small and counterfeits are of bad quality. In this case, paradoxically, counterfeits contribute to the firm's reputation and its sales in the long term, because customers likely buy the counterfeit only once, recognise its poor quality and then turn to the original. However, if a counterfeiter were able to achieve similar quality and copy the design identically, this strategy would no longer be viable, because the difference between counterfeit and original would be imperceptible to customers.

Second, this strategy works only as long as the marginal damage from each counterfeited product is minimal. However, if this marginal damage rapidly increases, even if the number of counterfeits remains low (e.g., customers buy counterfeited drugs and are harmed or even killed, as has happened in China), the company cannot rely on this strategy.

## Elements Influencing de Facto Protection Strategies

The interviewed managers' assessments ranged from relaxed optimism ('*IP is not an issue*', Case J) to desperate pessimism ('*we are essentially powerless against the outflow of our IPR*', Case I), which suggests contingency factors may govern the suitability of each strategy for firms. On the basis of our results, we group these contingency factors into three constructs.

### *Product Structure and Know-how Intensity*

The managers in Cases E and L, which have not suffered any IPR infringement since they entered China, reserve the 'key' to the understanding the functioning of their product. This 'key' can take the form of secret knowledge about the molecular structure and composition of the product (Case E) or a physical memory key, without which the product cannot be activated (Case L). Other case examples show that a product's technological specialisation provides an effective barrier to imitation. Relying on the secrecy of the processes and algorithms that will produce the results needed for their blueprints is the only protection in Case I. State-owned customers force this firm to reveal its technology, but the managers reveal only the results, not how they achieved these results. Thus, though IPR infringements occur continually, the damage from these infringements is limited.

### *Customer Structure*

The de facto strategy that managers deploy seems to depend on whether the firm's customers are individuals, private indigenous firms or state-owned enterprises. In a mass market of individual customers, counterfeits and IPR infringements exist but do not threaten the firm's competitive position, because they offer only poor quality, and such street-corner counterfeits, almost paradoxically, can promote the original firm's brand name and products. However, if customers are indigenous Chinese firms, the firm should adopt technological specialisation, because competing Chinese firms can deliver much better quality counterfeits than can small imitators. Interactions with state-owned firms seem to be the most dangerous settings for a firm's IPR, because the firm cannot rely on the effectiveness of informal relations with government decision makers for protection; these decision makers themselves are interested in transferring technology to China, even through IPR infringement.

### *Cultural Competence*

Some managers have developed de facto protection strategies that take advantage of the importance of social relationships in China. When firms can construct internal networks of trusted relationships with employees and external networks with government officials and the administrative arm of the legal system (e.g., customs), they seem better able to protect their IPR. However, these strategies require considerable financial resources; managers who have crafted them engage in many lectures, seminars, road shows and informal meetings, which require significant time and resource investments. We suggest

that larger, better known, reputed firms should be more likely to employ these guanxi-related strategies.

## Discussion

The first goal of our study has been to develop a theoretical understanding of how a firm can protect its IPR in an environment in which enforcement of IPR is difficult or impossible. We posit that the *de facto* strategies can be considered a ‘third’ group of appropriation mechanisms that complements the two known groups of formal and complementary measures. Thus, our findings extend existing literature on appropriation, which mostly analyses economies characterised by strong appropriability regimes. As our findings show, emerging economies characterised by weak appropriability regimes demand a different approach to safeguard appropriation.

We also can relate our findings to extant theory and judge the contributions our findings offer. We propose a simple matrix that analyses whether only patents, only complementary mechanisms, both or none are efficient for protecting a firm’s IPR. This approach, as depicted in Fig. 1, indicates four sectors in which extant theory and our findings can be juxtaposed.

According to this matrix, our findings cover a little addressed sector, namely, where *none* of the known measures of appropriation provide effective protection for firms’ IPR. Moreover, the matrix implies two conclusions related to previous work on appropriability and IPR. First, our findings somewhat mitigate Teece’s (1986) rather pessimistic prediction that innovators in markets characterised by weak appropriability regimes will lose their competitive advantage to imitators. Rather, we find that managers of firms active in such contexts develop a new class of mechanisms—*de facto* protection strategies—that enable them to safeguard their firms’ competitive advantage, despite a weak appropriability system. Second, we offer an applied example of Teece’s (2000) proposal that competitive advantage is easier to protect when the firm can create and exploit more difficult-to-replicate, non-tradable assets.

The *de facto* protection strategies that these managers have crafted serve to achieve exactly this goal, in that most of them generate ‘keys’ or highly complex and fragmented knowledge that make imitation impossible. However, our findings also demonstrate that these difficult-to-replicate, non-tradable elements are necessarily ‘assets’. As the guanxi strategies show, they can also take on the form of relationships. Thus, the rationale behind these strategies involves using firm-external elements, such as powerful decision-making bodies, for IPR protection, rather than relying on firm-internal assets alone.

The second goal of our investigation was to inform managers about which *de facto* strategies exist and how they can be applied. Managers can benefit from the strategies we outline and from a greater understanding of their rationale, benefits and risks in several ways. First, these strategies reveal that even when it is difficult or impossible to enforce IPR, a firm still can undertake measures to achieve effective IPR protection, without using the legal system. Thus, managers can gain insights into how to prevent the outflow of IPR, rather than merely reacting after infringements have occurred or counterfeits have appeared in the market.

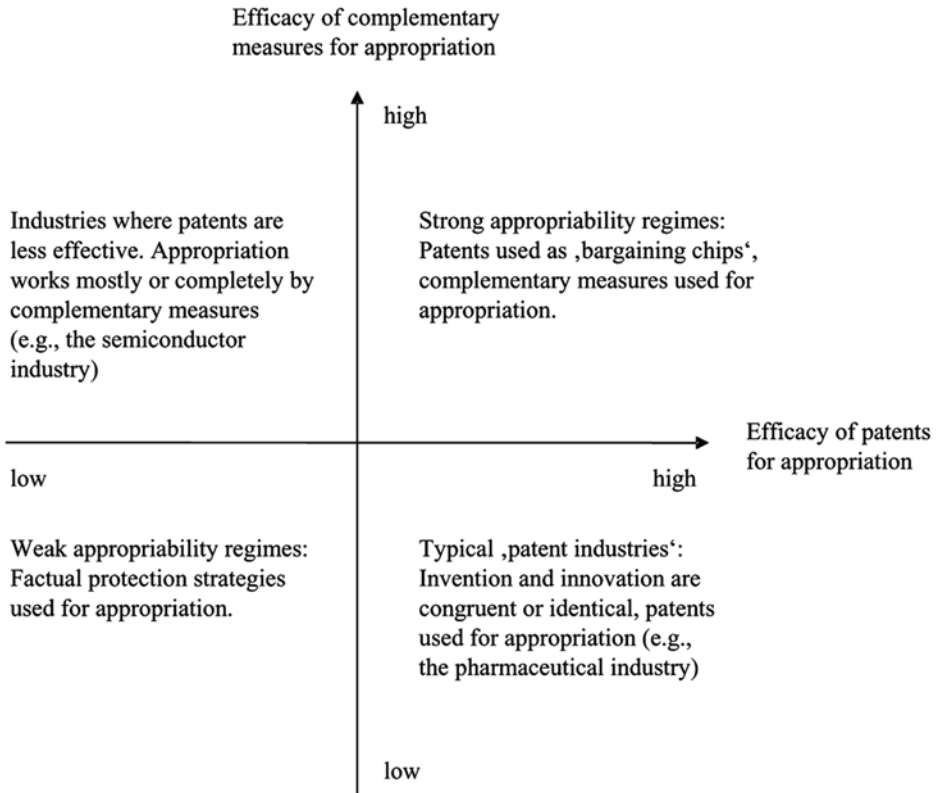


Fig. 1: IPR Protection Subject to the Efficacy of Appropriation Mechanisms

Second, the de facto protection strategies are not mutually exclusive. Most firms we analyse use more than one, and managers should feel confident in combining measures according to the specific IPR they must protect. In particular, de facto protection strategies need not be ‘active’, in the sense of taking pre-emptive measures. For example, the educate the customer strategy is somewhat paradoxical, because it adopts passivity towards counterfeits that cannot be pre-empted beforehand, yet in the long term, the firm still wins out over counterfeiters.

Third, the high costs of holding a patent portfolio and pursuing lawsuits or litigation mean that managers who know how to protect their firms’ IPR without resorting to these tactics may save their firms a lot of resources.

Keeping a patent in force over its lifetime can cost up to \$250,000 in maintenance fees (Earl 2001). De facto protection strategies thus may save resources that otherwise could have been invested in building patent portfolios.

The third goal of our article has been to discuss how de facto strategies identified in the specific context of China might apply to other emerging economies. We therefore re-consider the dichotomy between passing and enforcing laws discussed in Section 2. Although China offers an extreme example of an emerging economy in which IPR legis-



lation and enforcement differ, it is not the only economy characterised by this distinction. Many developing countries that are net importers of information goods and services have resisted Western advocacy of strong national IPR regimes and international harmonization (Gakunu 1989; de Almeida 1995; Sell 1998). For example, many Arab countries have had IPR laws and legislations for decades, but there is an evident lack of implementation and enforcement of these laws (Carroll 2001).

Furthermore, though cultural issues play a strong role in China, we do not believe they necessarily correlate with the phenomenon of 'copying'. Gadbow and Richards (1988) study developing countries as culturally different as Taiwan, Korea, Singapore, Argentina, Brazil, Mexico, and India. They consistently find formal IPR legislation, yet the enforcement and protection of IPR are inadequate, and piracy remains a great problem.

The difference between passing laws and enforcing laws in emerging economies thus appears responsible for the IPR enforcement problems that foreign firms experience, not the specific cultural context of China. De facto protection strategies that are not directly related to cultural issues (i.e., technological specialisation, de facto secrecy and educate the customer) in principle should be applicable to other emerging economies.

However, as an extreme example, China is not easily comparable to other emerging economies. Before the 1970s, China dismissed law systems based on Roman right or British common law and instead adopted Confucian philosophy, which clearly influences the country's attitude towards IPR and cannot be changed in the short time span of several decades. Contextual communication and the importance of relationships, rather than formal law, exacerbate this problem. These extreme conditions differ considerably from emerging economies that have longer experienced Western influence, which suggests they may have different attitudes towards written laws (e.g., India). China and other emerging economies may exhibit similar distinctions between IPR legislation and enforcement, but the country-specific reasons for this difference may vary greatly and influence the degree to which the de facto strategies we identify apply in other emerging economies. More cross-country empirical research would be desirable to study the transferability of these de facto strategies to other emerging economies or compare different de facto strategies from different countries.

Finally, our results suffer some data limitations. Our study design ensures that our findings represent only an incomplete sample of possible de facto IPR protection strategies, rather than a complete portfolio of all existing strategies. It contains only firms that have achieved success with their de facto strategies, which means we provide no data about failed de facto strategies. Moreover, we rely on interview data from co-operating firms; other firms may have developed additional de facto strategies that we could not investigate. Our article, due to this limitation, suggests several possibilities for further research that undertakes some promising empirical explorations.

First, the topic of how multi-national firms might defend themselves against aggressive domestic firms is relatively new and unexplored (Jaffe et al. 2005; Wu and Pangarkar 2006). The de facto strategies we feature herein may represent defensive measures in such settings.

Consequently, our findings can provide a starting point for exploring, for example, the interaction between the strategic moves of domestic firms (which strive for technology diffusion) and foreign firms (which strive to prevent this diffusion) in shaping the IPR

situation of emerging economies. Second, the recent suggestion that a new marketing paradigm, fundamentally different from Western marketing practices, may be appropriate for emerging markets (Dawar and Chattopadhyay 2002) implies that a new IPR paradigm also may be needed. De facto protection strategies could be part of this ‘emerging economy’ IPR paradigm, an issue that has yet to be unexplored. Third, it would be interesting to study the performance implications of de facto protection strategies systematically, both among each other and as opposed to formal measures.<sup>3</sup> Our research confirms the existence of de facto protection strategies, but we do not investigate whether some strategies are more efficient than others (and in which circumstances and contingencies). Research might investigate, for example, whether in an emerging economy, firms that use de facto protection perform better (i.e., damages avoided, revenue from licenses) than firms that do not use such strategies. Fourth, more comparative case study work might elaborate on theoretical propositions about the de facto protection strategies. By comparing in-depth case studies of firms that use de facto strategies with those that do not, further research might causally pinpoint firm-level characteristics and theoretical mechanisms that determine why some firms achieve effective IPR protection in emerging economies whereas others do not.

## Endnotes

- 1 We use the term intellectual property rights (IPR) in accordance with the definition of the World Intellectual Property Organisation (WIPO 2005): a construct that covers both copyrights and industrial property. Copyrights result from literary, artistic, and scientific work; industrial property rights result from inventions, industrial designs, trademarks, service marks, commercial names and designations and protect against unfair competition.
- 2 We thank an anonymous reviewer for drawing our attention to this paradox.
- 3 We thank an anonymous reviewer for this suggestion.

## Appendix: Detailed Description of Methodology

### Identification of Firms

The final sample of the 13 firms derives from two sources. First, in a quantitative survey to explore different aspects of firms’ behaviour in China, we included items about IPR management in an attempt to corroborate our initial presumption that de facto IPR protection strategies exist. Replies to the four items were measured on Likert scales ranging from 1 (‘do not agree at all’) to 5 (‘totally agree’). These four items were ‘We have developed methods to protect our IPR regarding our product development process’ (q1), ‘We have developed methods to protect our IPR regarding our sensitive technology’ (q2), ‘We have developed measures that successfully protect our IPR in China’ (q3) and ‘Do you think that the enforceability of your IPR is a great problem for your business activities in China?’ (q4).

This survey was implemented among 114 firms that ran fully owned and fully controlled R&D units in China, performing research, development or both, because we expected such firms to be vulnerable to uncontrolled outflows of IPR. Therefore, we estimated that such firms would be more likely to have developed de facto IPR protection strategies. We identified the firms from publicly available sources and databases. Of the 114 firms, 29 cooperated in the survey, but 2 observations had to be deleted because of missing data on the IPR-related questions, so 27 observations remained for analysis. Despite its quantitative nature, this survey was essentially exploratory, and its primary purpose was to acquire interview partners. We then contacted the 27 respondents by telephone and invited them to cooperate in personalised interviews about their IPR protection strategies in China. Eight of the 27 firms chose to cooperate. Second, we negotiated access to another five firms through personal contacts with the German Centre for Industry and Trade in Beijing (<http://www.germancentre.org.cn>). In combination, the two sources yielded the final sample of 13 firms. The headquarters of these 13 firms were located in Switzerland (5), Germany (5), the Netherlands (1), the United States (1) and Japan (1).

Our identification processes included wholly owned subsidiaries of foreign firms in China only, excluding questions and phenomena related to Sino–foreign joint ventures. Significant research on Sino–Western business relationships concentrates on joint venture problems and technology transfer between joint venture partners. However, since the Chinese government legalised foreign wholly owned subsidiaries in 2002, more and more firms are establishing them or engage in buy-outs to turn former joint ventures into wholly owned subsidiaries. Thus, these ventures now compete directly with Chinese firms, and such direct confrontation is very different than interactions with joint venture partners.

### Interview Methods, Reliability and Validity

All interviews were conducted in China, in the firm's main subsidiary (i.e., regional Chinese headquarters), except for two firms whose senior managers responsible for IPR protection in China happened to be in Europe; these two interviews were scheduled in Switzerland.

The sensitivity of the topic prompted confidentiality concerns, so we were obliged to sign confidentiality agreements and ensure firm anonymity when reporting the results. We sought multiple respondents in all firms to prevent single-respondent bias and interviewed at least two senior managers in each subsidiary whose main responsibility was the protection of the firm's IPR, such as managing directors and patent lawyers. All managers were expatriates. We chose these respondents to ensure the interviewees had high-level, detailed knowledge of the subject matter. Furthermore, we used in-depth, semi-structured interviews to encourage interviewees to provide own ideas, which we might not have considered initially, and thus enhance the construct validity.

To ensure the reliability of the measurement, we consistently used the same interview guideline and standardised the number and order of questions across interviews. None of the firms allowed us to audiotape these interviews, so we created transcripts during the interviews and checked them with interviewees to ensure the correct replication of their answers.

Interview language was German for Cases D, F, G, I and M (translated into English by the authors for this contribution) and English in Cases A, B, C, E, H, J, K and L. Transcripts were analysed using content analysis, designed to identify the de facto IPR protection strategies across individual case data. We present the results thematically, clustered according to these strategies, rather than separately for each firm. To increase the validity of the content analysis, we also triangulated the interview data with all secondary company data we could obtain.

## References

- Allred, B., & Park, W. (2007). Patent rights and innovative activity: Evidence from national and firm-level data. *Journal of International Business Studies*, 38(6), 878–900.
- Anand, B., & Galetovic A. (2004). How market smarts can protect property rights. *Harvard Business Review*, 82(12), 73–79.
- Arundel, A., & Kabla, I. (1998). What percentage of innovations are patented? Empirical estimates for European firms. *Research Policy*, 27(2), 127–141.
- Asia Law & Practice (1995). *Intellectual property in China: Practical strategies*. Hong Kong: Asia Law and Practice Ltd.
- Blind, K. et al. (2006). Motives to patent: Empirical evidence from Germany. *Research Policy*, 35(5), 655–672.
- Bosworth, D., & Yang, D. (2000). Intellectual property law, technology flow and licensing opportunities in the people's republic of China. *International Business Review*, 9(4), 453–477.
- Carroll, J. (2001). Intellectual property rights in the Middle East: A cultural perspective. *Fordham Intellectual Property, Media and Entertainment Law Journal*, 11(3), 555–560.
- Cheng, J. (1998). China's copyright system: Rising to the spirit of TRIPS requires an internal focus and WTO membership. *Fordham International Law Journal*, 19(4), 1965–1979.
- Child, J., & Möllering, G. (2003). Contextual confidence and active trust development in the Chinese business environment. *Organization Science*, 14(1), 69–80.
- Cohen, W. M. et al. (2002). R&D spillovers, patents and the incentives to innovate in Japan and the US. *Research Policy*, 31(8–9), 1349–1367.
- Cohen, W. M., Nelson, R. R., & Walsh, J. P. (2000). Protecting their intellectual assets: Appropriability conditions and why U.S. manufacturing firms patent (or not). *NBER Working Paper*, 7552.
- Correa, C. (1995). Intellectual property rights and foreign direct investment. *International Journal of Technology Management*, 10(2–3), 173–199.
- Dawar, N., & Chattopadhyay, A. (2002). Rethinking marketing programs for emerging markets. *Long Range Planning*, 35(2), 457–474.
- De Almeida, P. (1995). The political economy of intellectual property protection: Technological protectionism and transfer of revenue among nations. *International Journal of Technology Management*, 10(2–3), 214–229.
- Earl, M. (2001). Knowledge management strategies: Toward a taxonomy. *Journal of Management Information Systems*, 18(1), 215–233.
- Eisenhardt, K. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550.
- European Commission (2004). *The 2004 TAXUD Report on Counterfeits Seized by EU Customs*. Brussels: European Commission.
- Feng, P. (1997). *Intellectual Property in China*. Hong Kong: Sweet & Maxwell Asia.
- Gadbaw, R., & Richards, T. (Eds.). (1988). *Intellectual property rights: Global consensus, global conflict*. Westport, Connecticut: Westview Press.

- Gakunu, P. (1989). Intellectual property: Perspectives of the developing world. *Georgia Journal of International and Comparative Law*, 19(2), 358–365.
- Glass, A. J., & Saggi, K. (2002). Intellectual property rights and foreign direct investment. *Journal of International Economics*, 56(2), 387–410.
- Gould, D., & Gruben, W. (1996). The role of intellectual property rights in economic growth. *Journal of Development Economics*, 48(2), 323–350.
- Granstrand, O. (1999). *The economics and management of intellectual property: Towards intellectual capitalism*. Cheltenham: Edward Elgar.
- Hall, B. H., & Ziedonis, R. H. (2001). The patent paradox revisited: An empirical study of patenting in the U.S. semiconductor industry 1979–1995. *RAND Journal of Economics*, 32(1), 101–128.
- Harabi, N. (1995). Appropriability of technical innovations: An empirical analysis. *Research Policy*, 24(6), 981–992.
- Jaffe, A., & Lerner, J. (2004). *Innovation and its discontents: How our broken patent system is endangering innovation and progress, and what to do about it*. Princeton, NJ: Princeton University Press.
- Jaffe, E. D., Nebenzahl, I. D., & Schorr, I. (2005). Strategic options of home country firms faced with MNC entry. *Long Range Planning*, 38(2), 183–195.
- Johnson, G., Melin, L., & Whittington, R. (2003). Micro strategy and strategizing: Towards an activity-based view? *Journal of Management Studies*, 40(1), 3–22.
- Kambil, A., Long, V. W., & Kwan, C. (2006). The seven disciplines for venturing in China. *MIT Sloan Management Review*, 47(2), 85–89.
- LaCroix, S., & Konan, D. (2002). Intellectual property rights in China: The changing political economy of Chinese-American interests. *The World Economy*, 25(6), 759–788.
- Levin, R. C. et al. (1987). Appropriating the returns from industrial research and development. *Brookings Papers on Economic Activity*, 18(3), 783–820.
- Luo, Y. (2000). *Guanxi and Business*. New York: World Scientific.
- Mansfield, E. (1986). Patents and innovation: An empirical study. *Management Science*, 32(2), 173–181.
- Mansfield, E., Schwartz, M., & Wagner, S. (1981). Imitation costs and patents: An empirical study. *Economic Journal*, 91(364), 907–918.
- Maskus, K., & Penubarti, M. (1995). How trade-related are intellectual property rights? *Journal of International Economics*, 39(3), 227–248.
- Mazzoleni, R., & Nelson, R. R. (1998). Economic theories about the benefits and costs of patents. *Journal of Economic Issues*, 32(4), 1031–1052.
- McGaughey, S. L., Liesch, P. W., & Poulson, D. (2000). An unconventional approach to intellectual property protection: The case of an Australian firm transferring shipbuilding technologies to China. *Journal of World Business*, 35(1), 1–20.
- Mowery, D., & Oxley, J. (1995). Inward technology transfer and competitiveness: The role of national innovation systems. *Cambridge Journal of Economics*, 19(1), 67–93.
- Park, W., & Ginarte, C. (1997). Intellectual property rights and economic growth. *Contemporary Economic Issues*, 15(3), 51–61.
- Park, W., & Lippoldt, D. (2005). International licensing and the strengthening of intellectual property rights in developing countries during the 1990s. *OECD Economic Studies*, 40(1), 7–48.
- Pasco, B. C. (1998). Technology transfer in a Ricardian mode: Chinese technological “Osmosis” in theory and practice. *Studies in Comparative International Development*, 32(4), 79–100.
- Primo Braga, C. (1989). The economics of intellectual property rights and the GATT: A view from the South. *Vanderbilt Journal of Transnational Law*, 22(2), 243–264.
- Primo Braga, C. (Ed.). (1990). *Strengthening protection for intellectual property in developing countries: A survey of the literature*. World Bank Discussion Paper 112. Washington, DC: World Bank.

- Reed, R., & DeFillippi, R. J. (1990). Causal ambiguity, barriers to imitation, and sustainable competitive advantage. *Academy of Management Review*, 15(1), 88–103.
- Sattler, H. (2003). Appropriability of product innovations: An empirical analysis for Germany. *International Journal of Technology Management*, 26(5–6), 502–516.
- Sell, S. (1998). *Power and ideas: North-South politics of intellectual property and antitrust*. Albany: State University of New York Press.
- Smith, P. (2001). How do foreign patent rights affect US exports, affiliate sales, and licenses? *Journal of International Economics*, 55(2), 411–439.
- Teece, D. J. (2002). *Managing intellectual capital: Organizational, strategic, and policy dimensions*. Oxford: Oxford University Press.
- Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy*, 15(6), 285–305.
- Teece, D. J. (2000). Strategies for managing knowledge assets: The role of firm structure and industrial context. *Long Range Planning*, 33(1), 35–54.
- The Swiss-Chinese Survey (2006). *Behind the China kaleidoscope: A guide to China entry and operations*. Shanghai: China Ltd.
- United Nations Conference on Trade and Development (2005). *World Investment Report 2005: Transnational Corporations and the Internationalization of R&D*. New York and Geneva: United Nations.
- United States Trade Representative (2005). *Special 301 Report*. Washington, DC: United States Trade Representative Office.
- Watal, J. (2000). *Intellectual property rights in the WTO and developing countries*. The Hague: Kluwer Law International.
- Weldon, E., & Vanhonacker, W. (1999). Operating a foreign-invested enterprise in China: Challenges for managers and management researchers. *Journal of World Business*, 34(1), 94–107.
- WIPO (World Intellectual Property Organization) (2005). *WIPO Intellectual Property Handbook: Policy, Law and Use, WIPO Publication No. 489 (E)*. Geneva: World Intellectual Property Organization.
- Wu, J., & Pangarkar, N. (2006). Rising to the global challenge: Strategies for firms in emerging markets. *Long Range Planning*, 39(3), 295–313.
- Yang, D., Sonmez, M., & Bosworth, D. (2004). Intellectual property abuses: How should multinationals respond? *Long Range Planning*, 37(5), 459–475.
- Yin, R. (1989). *Case study research: Design and methods*. Beverly Hills, CA: Sage.
- You, K., & Katayama, S. (2005). Intellectual property rights protection and imitation: An empirical examination of Japanese FDI in China. *Pacific Economic Review*, 10(4), 591–604.
- Zander, U. (1991). *Exploiting a technological edge: Voluntary and involuntary dissemination of technology*. Stockholm: Stockholm School of Economics.