

Intellectual Property in the 21st Century

Intellectual Property Infringement and Indigenous Innovation in China



Hannes Schulze
Emil Peters
Editors

NOVA

INTELLECTUAL PROPERTY IN THE 21ST CENTURY

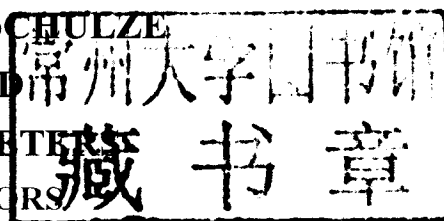
INTELLECTUAL PROPERTY INFRINGEMENT AND INDIGENOUS INNOVATION IN CHINA

HANNES SCHULZE

AND

EMIL PETER

EDITORS



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PREFACE

Intellectual property rights (IPR) infringement in China reduces market opportunities and undermines the profitability of U.S. firms when sales of products and technologies are undercut by competition from illegal, lower-cost imitations. Intellectual property (IP) is often the most valuable asset that a company holds, but many companies, particularly smaller ones, lack the resources and expertise necessary to protect their IP in China. "Indigenous innovation" policies, which promote the development, commercialization and purchase of Chinese products and technologies, may also be disadvantaging U.S. and other foreign firms and creating new barriers to foreign direct investment and exports to China. In this new book, the U.S. International Trade Commission describes the principal types of reported IPR infringement in China, as well as Chinese indigenous innovation policies.

Chapter 1 - China's World Trade Organization (WTO) accession in 2001 marked a milestone in the country's integration into the global economy. China has developed into one of the world's most important growth markets, and is now the second-largest U.S. trading partner (after Canada). As one important aspect of WTO accession, China committed to complying with the requirements of the WTO Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, which addresses intellectual property rights (IPR). However, IPR infringement in China—including violations of copyrights, trademarks, patents, and trade secrets—remains a central concern in the U.S.-China bilateral trade relationship. To reach its findings in this report, the Commission has relied on information from a wide variety of sources, including industry, government, and academia.

Chapter 2 - China's rapid economic transformation over the past three decades has presented both opportunities and challenges to many U.S. businesses. As of 2009, China's economy accounted for 8.6 percent of world GDP, compared to 1.8 percent at the initiation of its market-oriented reform process in 1978. This increase was due to China's robust economic growth, which averaged 10.0 percent in real terms over this period. International trade with the United States and other countries has substantially contributed to China's economic growth. In 2010, China was the United States' second-largest single country trading partner and the largest source of U.S. imports. Moreover, China currently ranks as the United States' third-largest export market, and is a principal source of growth for many U.S. companies with operations and sales in China.

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Chapter 1

**CHINA: INTELLECTUAL PROPERTY INFRINGEMENT,
INDIGENOUS INNOVATION POLICIES,
AND FRAMEWORKS FOR MEASURING
THE EFFECTS ON THE U.S. ECONOMY***

United States International Trade Commission

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ABSTRACT

Intellectual property rights (IPR) infringement in China reduces market opportunities and undermines the profitability of U.S. firms when sales of products and technologies are undercut by competition from illegal, lower-cost imitations. Intellectual property (IP) is often the most valuable asset that a company holds, but many companies, particularly smaller ones, lack the resources and expertise necessary to protect their IP in China. “Indigenous innovation” policies, which promote the development, commercialization, and purchase of Chinese products and technologies, may also be disadvantaging U.S. and other foreign firms and creating new barriers to foreign direct investment (FDI) and exports to China.

China's World Trade Organization (WTO) accession in 2001 marked a milestone in the country's integration in the global economy. China has developed into one of the world's most important growth markets and is now the second-largest U.S. trading partner (after Canada). As one important aspect of WTO accession, China committed to complying with the requirements of the WTO Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement. However, IPR infringement in China—including violations of copyrights, trademarks, patents, and trade secrets—remains a central area of U.S. concern in the bilateral trade relationship.

This is the first of two reports requested by the U.S. Senate Committee on Finance (Committee) on the effects of IPR infringement and indigenous innovation policies in China on U.S. jobs and the U.S. economy. In this report, the U.S. International Trade Commission (Commission or USITC) was requested to describe the principal types of reported IPR infringement in China, describe Chinese indigenous innovation policies, and outline an analytic framework for determining the effects of both IPR infringement and indigenous innovation policies on the U.S. economy.

Editor's note: Information received after initial publication has resulted in a correction to page 2-13 of the report.

ACRONYMS

863 program	State High-Tech Development Plan
AIC	Administration for Industry and Commerce
AML	Anti-Monopoly Law
ANSI	American National Standards Institute
API	Active pharmaceutical ingredient
AQSIQ	Administration of Quality Supervision, Inspection, and Quarantine
ATP	Advanced technology products
ATV	All-terrain vehicle
BASCAP	Business Action to Stop Counterfeiting and Piracy
BEA	Bureau of Economic Analysis
BSA	Business Software Alliance
CATT	China Academy of Telecommunications Technology
CBP	Customs and Border Protection
CC	Common Criteria
CCC	China Compulsory Certificate
CCTV	China Central Television
CD	Compact disc
CDMA	Code Division Multiple Access
CEPR	Center for Economic and Policy Research
CGE	Computable General Equilibrium
CNCA	Certification and Accreditation Administration
CNIS	China National Institute of Standardization
CNR	China National Railway Corporation
CRS	Congressional Research Service
DC	Direct current
DVD	Digital video disc
ECAT	Emergency Committee for American Trade

EU	European Union
E-waste	Electronic waste
FAS	Foreign Agricultural Service
FBI	Federal Bureau of Investigation
FDA	Food and Drug Administration
FDI	Foreign direct investment
FIE	Foreign-invested enterprise
FTZ	Free trade zone
FY	Fiscal year
GAC	General Administration of Customs
GAO	Government Accountability Office
GAPP	General Administration of Press and Publications
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GFCI	Ground fault circuit interrupter
GIPC	Global Intellectual Property Center
GMAC	Graduate Management Admission Council
GNI	Gross national income
GPA	WTO Government Procurement Agreement
GTAP	Global Trade Analysis Project
HNTE	High- and New-Technology Enterprises
IC	Integrated circuit
ICC	International Chamber of Commerce
ICT	Information and communication technology
IDC	International Data Corporation
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IIPA	International Intellectual Property Alliance
IMF	International Monetary Fund
IP	Intellectual property
IPEC	Intellectual Property Enforcement Coordinator
IPR	Intellectual property rights
ISO	International Organization for Standardization
IT	Information technology
ITIC	Information Technology Industry Council
ITU	International Telecommunications Union
JCCT	U.S.-China Joint Commission on Commerce and Trade
M&A	Mergers and acquisitions
MIIT	Ministry of Industry and Information Technology
Mil-spec	Military-specification
MLP	Medium- to Long-Term Plan for the Development of Science and Technology
MLPS	Multilevel Protection Scheme
MNC	Multinational Corporation
MOE	Ministry of Education
MOF	Ministry of Finance

MOFCOM	Ministry of Commerce
MOST	Ministry of Science and Technology
MP3	Moving picture experts group 1 or 2, Layer 3 audio, digital audio encoded format
MPAA	Motion Picture Association of America
NAM	National Association of Manufacturers
NBC	National Broadcasting Company
NCAC	National Copyright Administration of China
NDRC	National Development and Reform Commission
NFTC	National Foreign Trade Council
NIPS	National Intellectual Property Strategy
NIST	National Institute of Standards and Technology
OECD	Organisation for Economic Co-operation and Development
OEM	Original equipment manufacturer
OMB	Office of Management and Budget
PC	Personal computer
PSI	Pharmaceutical Security Institute
P2P	Peer-to-peer
R&D	Research and development
RAND	Reasonable and nondiscriminatory
RMB	Renminbi
ROW	Rest of the world
SAC	Standardization Administration of China
SAIC	State Administration for Industry and Commerce
SAR	Special Administration Regions
SASAC	State Assets Supervision and Administration Commission
SAT	State Administration of Taxation
SEC	U.S. Securities and Exchange Commission
SEZ	Special Enterprise Zone
SFC	Senate Committee on Finance
SFDA	State Food and Drug Administration
SIPO	State Intellectual Property Office
SME	Small and medium-sized enterprises
SOE	State-owned enterprise
SVIA	Specialty Vehicle Institute of America
TBT	WTO Technical Barriers to Trade Committee
TCG	Trusted Computing Group
TCM	Trusted Cryptography Module
TD-LTE	Time Division Long Term Evolution
TD-SCDMA	Time Division Synchronous Code Division Multiple Access
TIA	Telecommunications Industry Association
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UAE	United Arab Emirates
UNODC	United Nations Office on Drugs and Crime
USAGE	U.S. Applied General Equilibrium model
USCBC	U.S.-China Business Council

USDA	U.S. Department of Agriculture
USITC	U.S. International Trade Commission
USTR	U.S. Trade Representative
WAPI	Wired Authentication and Privacy Infrastructure
WCDMA	Wideband Code Division Multiple Access
WHO	World Health Organization
WIPO	World Intellectual Property Organization
Wi-Fi	Trademark of the Wi-Fi Alliance
WLAN	Wireless Local Area Network
WTO	World Trade Organization
3G	Third generation
4G	Fourth generation

EXECUTIVE SUMMARY

China's World Trade Organization (WTO) accession in 2001 marked a milestone in the country's integration into the global economy. China has developed into one of the world's most important growth markets, and is now the second-largest U.S. trading partner (after Canada). As one important aspect of WTO accession, China committed to complying with the requirements of the WTO Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, which addresses intellectual property rights (IPR). However, IPR infringement in China—including violations of copyrights, trademarks, patents, and trade secrets—remains a central concern in the U.S.-China bilateral trade relationship. To reach its findings in this report, the Commission has relied on information from a wide variety of sources, including industry, government, and academia.

IPR infringement in China reduces market opportunities and undermines the profitability of U.S. firms when sales of their products and technologies are undercut by competition from illegal, lower-cost imitations. Intellectual property (IP) is often the most valuable asset that a company holds, but many companies, particularly small ones, lack the resources and expertise necessary to protect their property in China. China's "indigenous innovation" policies, which promote the development, commercialization, and purchase of Chinese products and technologies, may also be disadvantaging U.S. and other foreign firms and creating new barriers to foreign direct investment (FDI) and exports to China.

This is the first of two reports requested by the U.S. Senate Committee on Finance (Committee) on the effects of IPR infringement and indigenous innovation policies in China on U.S. jobs and the U.S. economy. In this report, the Committee asked the U.S. International Trade Commission (Commission or USITC) to describe the principal types of reported IPR infringement in China, describe Chinese indigenous innovation policies, and outline an analytic framework for determining the effects of both IPR infringement and indigenous innovation policies on the U.S. economy and U.S. jobs. Major findings are summarized below. The second report will describe the size and scope of reported IPR violations in China and provide, to the extent possible, a quantitative analysis of the effect of reported IPR infringement and indigenous innovation policies in China on the U.S. economy and jobs.

Major Findings

Enforcement of IPR laws remains a serious problem in China. Significant structural and institutional impediments undermine effective IPR enforcement in China. These include a lack of coordination among government agencies, insufficient resources for enforcement, local protectionism, and a lack of judicial independence. Administrative IPR enforcement, consisting of raids and seizure of infringing goods, generally results only in temporary slowdowns in production; penalties are not sufficient to deter repeat offenders. Criminal prosecutions, which could have a deterrent effect, are rare. There are also difficulties in prosecuting civil IPR cases, including relatively low damage awards, the lack of a robust system for discovery of evidence, sporadic application of contempt citations for uncooperative or dishonest defendants, an inexperienced judiciary, and onerous requirements for the use of evidence from abroad. However, there are some signs of improvement in IPR enforcement, especially with respect to courts in major cities in China.

Ineffective enforcement contributes to widespread IPR infringement in China. The illegal distribution of copyrighted works is common, both physically, for goods such as CDs and DVDs, and, increasingly, through digital means, such as Internet downloads of software, music, and movies. For example, about 240,000 Internet cafés in China reportedly rely on illegal copies of entertainment software. Similarly, trademarks for goods and services of all kinds are routinely counterfeited; from luxury goods to high-volume commodities, few products are immune from illegal imitation in China. The patents and trade secrets of U.S. firms are also infringed in China, although concrete information on this topic is more difficult to obtain.

China is implementing indigenous innovation policies that U.S. and foreign firms view as potentially reducing business opportunities in China's fast-growing economy. These policies—often embedded in government procurement, technical standards, anti-monopoly, and tax regulations or laws—aim to achieve several long-term goals. These goals include building domestic research and development (R&D) capabilities to facilitate Chinese firms' innovative capacity, limiting dependence on foreign technology and companies, and generally increasing the value that domestic companies add to China's economy. The indigenous innovation "web of policies" is expected to make it difficult for foreign companies to compete on a level playing field in China.

U.S.-China IP-Related Trade and Investment

IP creation and technological innovation drive economic growth. They also increase the competitiveness of firms, through the creation of new or improved products and processes, greater efficiencies, and enhanced returns on capital goods investment. Measures of IP's contribution to the U.S. economy suggest that IP-sensitive industries outperform non-IP-sensitive industries on a variety of economic measures, including sales, output, exports, wages, and capital expenditures. For example, IP-sensitive industries reportedly pay their employees nearly 60 percent more, and output and sales per employee are more than double those of non-IP-sensitive industries.

IP-sensitive products and services span a broad range of sectors. They range from technology-intensive products, such as computers and semiconductors, to the creative arts

(e.g., books and films), and branded products (e.g., apparel and footwear). IP-sensitive services include such intangible assets as the design of manufacturing processes and the brands that franchisees rely upon to sell their services. Table ES.1 provides examples of IP-sensitive sectors and products.

The effect of IPR infringement in China on the U.S. economy should be viewed in the context of the significant trade and investment relationship that links the United States, one of the world's most innovative countries, and China, a globally dynamic manufacturing base. During the past decade, China's economy grew by roughly 10 percent per year, and many Chinese firms are attempting to strengthen their competitive position by moving to more profitable stages of production. Much of the increase in China's sophisticated manufacturing capacity has been made possible by IP-sensitive technology provided by foreign investors from advanced industrial countries, including the United States. For example, total U.S. FDI stock in China increased from \$9.4 billion in 1999 to \$49 billion in 2009. Despite certain benefits that multinationals might gain from producing in China, they also face an array of IPR infringement problems in their supply chain operations. These include increasing competition from Chinese counterfeiters who use sophisticated manufacturing capabilities and cheaper prices to gain market share in China and external markets.

Table ES.1. Examples of potential IP-sensitive sectors and products

Sector/product
Aerospace product and parts manufacturing
Apparel manufacturing
Breweries, wineries, and distilleries
Computer and electronic product manufacturing
Computer systems design and related services
Electrical equipment, appliance, and component manufacturing
Footwear manufacturing and other leather products
Game, toy, and children's vehicle manufacturing
Internet publishing and broadcasting and Web search portals
Jewelry and silverware manufacturing
Machinery manufacturing
Medical equipment and supplies manufacturing
Motion picture and video industries
Motor vehicle equipment manufacturing
Newspaper, periodical, book, and directory publishing
Chemical manufacturing
Pesticide, fertilizer, and other agricultural chemical manufacturing
Pharmaceutical and medicine manufacturing
Research and development
Semiconductor and other electronic component manufacturing
Software publishing
Sound recording industries
Television broadcasting
Tobacco manufacturing
Watch, clock, and part manufacturing

Source: Compiled by USITC staff from industry and academic sources.

Note: Sectors and products correspond to NAICS classifications.

Bilateral trade and investment in IP-sensitive sectors are difficult to measure because of the complexity and scope of IP in traded goods and services; however, some metrics provide insights. There are three primary channels by which IP-sensitive goods and services flow between the United States and China: merchandise trade, royalty and license fee services, and FDI. Merchandise trade in advanced technology products (ATP), which serves as a proxy for high-tech, IP-sensitive products, expanded rapidly during 2000–09. U.S. ATP exports to China, which doubled in value during the period to \$17 billion in 2009, were concentrated in aircraft and parts, electronics products (including semiconductors), and computers. U.S. ATP imports from China increased nearly eightfold, to \$90 billion, with computers and cellular phones accounting for 90 percent of such imports. However, ATP categories cover only leading-edge technologies, so this proxy does not fully capture the broader scope of IP-sensitive high-technology trade or trademarked and copyrighted goods.

U.S. Customs and Border Protection (CBP) seizure data provide insight into U.S. imports of certain trademark-infringing goods from China. According to CBP, China was the source of 79 percent of all U.S. Customs seizures in FY 2009, and Hong Kong was the source of an additional 10 percent. As in previous years, footwear and apparel together accounted for the bulk of seizures (table ES.2). However, Customs data underrepresent the degree of IPR infringement, in part because trademarks generally must be recorded with CBP to be enforceable at the border, and most trademark owners do not take this step. Only about 26,000 of 1.6 million active trademarks in the United States have been recorded with CBP. Moreover, most CBP seizures are of products that are easily identifiable; many infringing products are more difficult to distinguish.

Table ES.2. U.S. border seizures of counterfeit and pirated goods from China, FY 2009

Commodity	Domestic value (Million \$)	% of total
Footwear	98.0	48
Handbags/wallets/backpacks	19.6	10
Consumer electronics	18.5	9
Wearing apparel	17.9	9
Computers/hardware	8.8	4
Jewelry	7.3	4
Pharmaceuticals	6.7	3
Media	5.5	3
Watches/parts	4.9	2
Toys/electronics games	4.5	2
All other commodities	13.1	6
Total	204.7	100

Source: U.S. Customs and Border Protection.

Relatively limited U.S. receipts of royalties and license fees from IP-sensitive services exports to China suggest IPR infringement and market access problems. U.S. companies receive these payments, primarily from affiliated businesses in China, on such intangible assets as industrial processes; books, records, and tapes; broadcasting services; and

computersoftware. Stronger IP protection generally is associated with larger flows of such payments. U.S. receipts of these payments from China were over \$2.3 billion in 2008—a small figure compared with the \$89 billion in U.S. receipts from the rest of the world (ROW). Notably, 2008 receipts of \$2 million from China for certain copyrighted materials were a fraction of the \$1.5 billion in such receipts from the ROW. This disparity likely reflects IPR infringement and market access restrictions in China.

FDI is another channel by which U.S. companies transfer IP to China. Weak IPR protection in China reportedly depresses the level of U.S. FDI in China. Even though the stock of U.S. investment in China has been increasing in recent years, it was a small share (1.4 percent) of the total stock of outbound U.S. investment in 2009.

Copyright and Trademark Infringement in China

The copyright industries (including music, movies, software, and publishing) produce both physical and digital goods, and both forms are subject to substantial infringement in China. Unauthorized transfer of copyrighted materials may occur through the use of physical media, such as a CD or DVD, or it may occur entirely online, through the electronic transfer of files. The growth of digital piracy is an increasing concern for copyright-intensive industries. Infringing products that are distributed digitally can quickly reach consumers in markets around the world, since they are produced and consumed through decentralized global networks. Enforcement against digital piracy is particularly challenging for smaller firms that do not maintain a physical presence in China. As China's population of Internet users has grown, both foreign and Chinese copyright holders have become increasingly concerned about digital infringement, and there have been some notable cases of strong copyright enforcement.

Shenzhen and Guangzhou are production and distribution hubs for copyright-infringing products. Organized, large-scale production and distribution of infringing optical discs and other media is especially common in the southern cities of Guangzhou and Shenzhen, which have been targeted by Chinese authorities as major sources of infringing materials. Industry sources also identify these cities as being among those most important in the illegal distribution of video game systems, which are banned in China yet are widely used there to play copyright-infringing video games.

Copyright infringement in China is closely linked to government delays and bans of copyrighted works because limited supply shifts demand to pirated versions. For example, in China, films, publications, music, and home entertainment products must be reviewed for prohibited content before being released. In some copyright-intensive industries, a foreign company must have a Chinese partner to distribute content. Moreover, certain distribution channels (such as online music distribution) are completely closed to foreign companies. For content that is delayed or never released through legal channels, the market may only be served by pirated copies. Several of these distribution restrictions have been found by the WTO to be inconsistent with China's WTO commitments.

Many U.S. companies doing business in China consider trademark counterfeiting to be one of their most serious problems. The effects of counterfeiting on trademark owners include lost sales and revenue, tarnished brand reputation, and substantial enforcement costs. The overriding concern for legitimate brand owners is that their products are effectively priced out

of markets in China and other countries by low-cost imitations. Counterfeiters in China reportedly vary widely in size and sophistication, ranging from mom-and-pop operations to former or even current joint venture partners, large private and state-owned enterprises, and organized crime syndicates.

The counterfeiting problem can be particularly difficult for smaller firms because they have a smaller volume of sales over which to spread enforcement costs and often lack the experience and resources necessary to address counterfeiting in China. Smaller firms often know little about how to resolve IPR infringement problems in China, are skeptical about the effectiveness of pursuing a resolution, and are concerned about potentially high costs.

Counterfeiting is concentrated in the industrialized southeastern region, particularly the provinces of Guangdong and Fujian. FDI inflows to these provinces in recent decades have contributed significantly to this problem. As foreign companies built factories, transferred production technology, and trained employees, manufacturing know-how and processes migrated to counterfeit establishments in this region. The Internet also plays a central role in the purchase and sale of counterfeit goods. E-commerce and auction sites originating in China facilitate the shipment of smaller and less detectable quantities of counterfeit goods around the world.

Patent Infringement and Trade Secret Misappropriation in China

U.S. and foreign firms in China rely on patents to protect inventions in a broad range of industries, including pharmaceuticals, telecommunications, electronics, chemicals, footwear, food and beverages, and construction and fixtures. Industry representatives express mixed opinions on whether there is antforeign bias in the issuance or enforcement of patents in China. However, some non-Chinese firms reportedly find it more difficult to obtain patents in sectors that the Chinese government considers of strategic importance, such as pharmaceuticals, renewable energy, and biotechnology.

The Chinese government's focus on indigenous innovation has spurred a boom in patenting by Chinese inventors. Although filings of all types of patents in China are on the rise, Chinese inventors particularly focus on utility model and design patents, while U.S. and other foreign inventors almost completely ignore such patents (table ES.3). Utility model and design patents are inexpensive and easy to obtain, as they are not substantively examined by patent examiners. Once a Chinese company has received such a patent, it can bring suit against foreign companies that manufacture similar goods in China or export them to China, or use the patent to defend against infringement allegations. Some utility model patents obtained by Chinese firms are alleged to be opportunistic and predatory.

Weaknesses in the Chinese judicial system can be particularly challenging in complex patent infringement cases. The lack of a robust discovery system, for example, means that patents covering production methods are difficult to enforce because defendants cannot be compelled to disclose how their products are made.

Industry representatives have identified factors that affect against whom and where a foreign firm brings suit for patent infringement in China. These factors include the possibility of bias in favor of large state-owned enterprises (SOEs) or local firms, as well as the substantial risk of noncompliance with court judgments in cases brought against small firms. Although suing a defendant in the jurisdiction where it is located can be problematic because

of the role that favoritism may play, choosing a different jurisdiction may increase the difficulty of actually enforcing the judgment.

Table ES.3. Categories and features of patents under Chinese law

	Invention	Utility model	Design
Subject matter	New technical solution relating to a product, process, or improvement thereof	New technical solution relating to the shape, the structure, or their combination, of a product which is fit for practical use	New design relating to the shape, pattern, color, or their combination, of a product which creates an aesthetic feeling and is fit for industrial application
Patent term	20 years	10 years	10 years
Examination	Substantive	Nonsubstantive	Nonsubstantive
Patents granted and domestic and foreign ownership (2009)	Total grants: 15,640 Domestic: 54% Foreign: 46%	Total grants: 32,382 Domestic: 99% Foreign: 1%	Total grants: 41,000 Domestic: 94% Foreign: 6%

Sources: U.S. Embassy, Beijing, and State Intellectual Property Office (SIPO).

U.S. firms employ a variety of non-litigation strategies to protect their technologies in China. Some U.S. firms rely to a greater degree on trade secrets or reportedly avoid developing or producing their most critical innovations in China, instead placing these “crown jewels” in locations with more effective enforcement. Other firms, particularly in industries where the capital costs of production are substantial and where product lifetimes are short, strive to stay one step ahead of infringing competitors through rapid innovation.

Information about the protection and enforcement of trade secrets in China is harder to obtain than that for patents and trademarks. Trade secret owners do not register their trade secrets with administrative agencies, but protect secrets through internal measures. However, the misappropriation of trade secrets may be addressed through administrative and judicial actions. Reportedly, the judicial preference in China for written evidence rather than witness testimony can make it difficult to establish the elements of a trade secret case.

Trade secret misappropriation in China reportedly is carried out by employees, business partners, computer hackers, and regulatory agencies. Employees may steal company secrets and take them to competitive ventures. Problems also arise when companies that are setting up new production facilities in China are required to partner with a Chinese design firm; some design firms reportedly have no qualms about disclosing trade secrets learned in the process. The misappropriation of trade secrets through computer hacking originating in China is an area of growing concern to firms in the United States and throughout the world. Trade secrets may also be leaked from data provided to regulatory authorities in certain industries such as pharmaceuticals, medical devices, plant varieties, and software. Some software encryption companies have been required to disclose their trade secret source code in order to obtain the China Compulsory Certification (CCC) approval needed to market their products in China.

U.S. courts have addressed the alleged misappropriation of trade secrets for the benefit of Chinese companies. The U.S. Department of Justice, for example, has prosecuted cases involving the theft of trade secrets related to the manufacture of auto parts, paints, and light-emitting diodes. The cases have resulted in substantial fines and imprisonment.