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

ACRONYMS—*Continued*

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 Intellection 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

ACRONYMS—*Continued*

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. The second report is due May 2, 2011.

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 computer software. 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 antiforeign 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.

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).

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.

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.

Indigenous Innovation and Standards Policies in China

The Chinese government is using policies in wide-ranging areas, including government procurement, technical standards, anti-monopoly policy, and tax policy, to raise the level of domestic innovation. However this effort may lead to a "web of policies" that will make it more difficult for foreign companies to compete in China. Industry representatives have voiced concerns that an integrated web of Chinese policies works together to build a small number of SOEs into "national champions," which China intends to become large and technologically-advanced enough to compete globally with today's high-tech market-leaders (figure ES.1). The policies at issue are evolving very quickly, and future effects remain uncertain.

The government procurement area is reported to represent the clearest manifestation to date of China's use of indigenous innovation policies to favor Chinese companies and the products of Chinese innovation at the expense of foreign companies. Many observers agree that the Chinese government is actively using government procurement contracts to create a market for the products of Chinese companies and to foster a general acceptance of Chinese brands over foreign brands. The Chinese government is expected to release a central government catalogue of indigenous innovation-accredited products. Observers anticipate that it will include few products made by foreign firms, as is true for catalogues already in effect in certain provinces. However, in several recent policy speeches, leading Chinese government officials have indicated that goods produced by Chinese affiliates of U.S. and other foreign firms will be considered indigenous innovation products. Thus, it remains to be seen how the policy will be implemented.

As part of the push for indigenous innovation, China has developed national standards specifically to compete with existing international standards, and, in some instances, has mandated the use of the new standards in Chinese markets. These standards act as market access barriers and force foreign companies to adopt Chinese technologies to conduct business in China.

According to standards experts, although China has made significant progress in improving its standard-setting processes, procedures can still be nontransparent and often continue to exclude meaningful opportunities for foreign companies to participate. Standards development in China occurs through a top-down system, and U.S. and other foreign firms are often entirely excluded from the process or are permitted to participate only as observers. This is in contrast to the U.S. approach to standards development in which the private sector tends to lead, with more limited government involvement.

U.S. firms argue that the Chinese standards-setting process often results in technical standards aimed at supporting the interests of domestic firms, rather than incorporating the best technology into new products. In particular, Chinese national standards are often developed for the purpose of including Chinese-developed IP in those standards. This practice reduces the royalties that Chinese firms must pay to foreign firms whose technology often forms a critical component of the global standard, while increasing royalties that foreign firms must pay to Chinese IP holders.

Frameworks for Quantifying the Effects of IPR Infringement and Indigenous Innovation in China on the U.S. Economy

The Commission is examining a variety of approaches for use in its second investigation to assess the quantitative effects of IPR infringement and indigenous innovation policy in China on the U.S. economy and U.S. jobs. The Commission is in the process of surveying U.S. firms and sectors that may be affected by China's IPR infringement and indigenous innovation policies. The results will be supplemented by econometric analyses, either derived from the available literature or conducted specifically for the second investigation. In addition, insights into economy-wide and sectoral effects can be gained by simulating the effects of improved IPR enforcement in China on the U.S. economy. The results gained from the questionnaire responses, econometric methods, and simulations should inform and serve as cross-checks on each other while providing a more comprehensive assessment of the effects on the U.S. economy of IPR infringement in China.

The questions analyzed in the second investigation will involve novel areas of research and quantification, and the Commission's approach, as proposed in this report, will likely evolve as issues are identified. Moreover, in the case of indigenous innovation policies that are of recent origin and rapidly evolving, quantitative methods may provide partial assessments of the effects of such policies on the U.S. economy or U.S. firms rather than definitive or complete ones.

The effects of IPR infringement and indigenous innovation policies vary according to the type of IP and the market channel involved. Patents, trade secrets, trademarks, and copyrights have different economic rationales, and their infringement affects IP owners and consumers in different ways. The wide variety of Chinese policies covered under the term "indigenous innovation" may act as a mechanism for import substitution in technology by favoring Chinese firms in relevant industries while reducing access to the Chinese market for foreign firms.

While econometric methods and survey methods have been used in previous studies that attempted to quantify the economic effects of IPR infringement, few studies have estimated the effects on the U.S. economy and jobs. The econometric literature indicates that countries with stronger IPR enforcement pay more in royalties and license fees to foreigners and attract more FDI. The United States generally exports more to countries with stronger IPR enforcement, although this is not true for all products equally. Previous econometric work also has made use of a variety of measures of the quality of a country's IPR environment. Some of these studies have focused on existing legal provisions, while others have attempted to capture the degree of enforcement. A variety of surveys have been used to quantify the effects of IPR infringement, although the surveys have significant limitations. Finally, relatively little work has been carried out to assess the effects of IPR infringement using the types of simulation methods, such as computable general equilibrium models, often used to estimate economy-wide effects of changes in trade policies.

CHAPTER 1
Introduction

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).[1] With a population of more than 1.3 billion people, China is an important source of economic opportunity for U.S. farmers, manufacturers, service providers, and their employees. There are, however, ongoing areas of concern in the bilateral economic relationship, including intellectual property rights (IPR) infringement and "indigenous innovation" policies in China. IPR infringement in China reduces market opportunities and undermines the profitability of U.S. firms in China, the United States, and third countries, where their products and technologies are undercut by low-cost imitations.[2] Indigenous innovation policies may disadvantage U.S. firms by favoring Chinese products and technologies over those of foreign companies, creating new barriers to U.S. foreign direct investment (FDI) and exports to China.[3]

"Intellectual property" (IP)[4] is a broad term that encompasses creations of the mind such as literary and artistic works (protected by copyrights), symbols and names used in commerce (trademarks), inventions (patents), and confidential business information developed by firms (trade secrets).[5] The value of IP and other intangible assets to the U.S. economy is substantial. According to a 2006 Federal Reserve Board analysis, investment in intangible assets in the United States—which includes IP, research and development (R&D), computer software, workforce training, and corporate spending to enhance brands—exceeds investment in tangible property.[6] Moreover, these intangible assets increasingly drive the competitiveness of U.S. firms and opportunities for U.S. workers.[7]

IP and other intangible assets drive competitiveness in various ways, including by enabling the creation of new products and processes and improving the quality of existing products; enhancing returns on investment in capital goods, such as computers and telecommunications equipment; and promoting efficiency by generating better ways of doing business.[8] Several industry-sponsored studies have specifically measured the contribution of IP to the U.S. economy and jobs. A 2005 study found that industries that rely on IP are major sources of economic growth and are among the largest and best-

[1] U.S. Census Bureau, Foreign Trade Statistics, "Top Trading Partners," n.d. (accessed August 27, 2010).

[2] See chapters 3, 4, and 6.

[3] See chapters 5 and 6. See also Geithner, Statement to the Senate Banking and House Ways and Means Committees, September 16, 2010, 4; Kirk, Statement to the Senate Finance Committee, June 23, 2010; Locke, Statement to the Senate Finance Committee, June 23, 2010.

[4] IP and IPR are used interchangeably in this report (and in common parlance), although generally IP refers to the property itself and IPR to the rights associated with the property.

[5] World Intellectual Property Organization (WIPO), "What Is Intellectual Property?" n.d. (accessed August 5, 2010).

[6] Board on Science, Technology, and Economic Policy and Committee on National Statistics, *Intangible Assets*, 2009, 1.

[7] Ibid.

[8] U.S. Department of Commerce (USDOC), "Patent Reform: Unleashing Innovation," April 2010.

paying employers in the United States.[9] More recently, a 2010 study found that from 2000 through 2007, IP-intensive industries outperformed non-IP-intensive industries on a variety of economic measures, including sales, output, exports, wages, and capital expenditures.[10]

Given the substantial contribution of IP to the U.S. economy, and the importance of China as a market, IPR infringement in China can negatively affect U.S. firms of all sizes. Small and medium-sized enterprises (SMEs) may be especially vulnerable to IPR infringement in China for at least two reasons: first, IP may be their most valuable asset; and second, they may lack the resources and expertise necessary to protect their IP and respond to infringement in China.[11]

China's indigenous innovation policies are also an important competitive issue for U.S. firms. China has introduced a number of policies aimed at increasing the level of scientific and technological innovation that originates within the country, as well as increasing the domestic share of the value embodied in goods made by Chinese companies. In a nutshell, China would like to shift from "made in China" to "created in China."[12] Policy arenas through which China is implementing indigenous innovation-related policies include government procurement, technical standards, and the enforcement of China's Anti-Monopoly Law (AML). U.S. firms are concerned that the policies may preclude their full participation in business opportunities arising from the fast-growing Chinese economy.[13]

Scope and Approach

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[14] on U.S. jobs and the U.S. economy.[15] In this report, the U.S. International Trade Commission (Commission or USITC) has been asked to describe the principal types of reported IPR infringement in China, to describe Chinese indigenous innovation policies, and to 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. This first report provides the framework for the second, which will describe the size and scope of reported

[9] Siwek, "Engines of Growth," 2005, 3. Siwek defines IP industries as including those sectors of the economy that depend on copyright or patent protections to function as viable commercial industries, and a portion of the distribution services industries needed for the physical and commercial delivery of IP products throughout the United States. The identification of U.S. industries that rely on IP is complex (see chapter 2).

[10] Pham, "The Impact of Innovation," 2010, 4. Wages, for example, are reportedly 60 percent higher in IP-intensive industries. Pham uses R&D expenditures as a proxy for reliance on IP. Industries with R&D expenditures higher than the national average are identified as IP-intensive.

[11] D'Addario, written testimony to the U.S. International Trade Commission (USITC), June 16, 2010, 3; NAM, written testimony to the USITC, June 15, 2010, 4; USITC, *Small and Medium-Sized Enterprises*, July 2010, 3–15; Barfield and Calfee, *Biotechnology and the Patent System*, 2007, 27.

[12] Industry officials, interviews by USITC staff, Shanghai, September 15, 2010.

[13] See chapter 5.

[14] For purposes of this report, "China" refers to mainland China and does not include Hong Kong or Macau. Hong Kong and Macau are special administrative regions (SARs), which operate under autonomous systems of government and constitutions. U.S. State Department, "Background Note: Hong Kong," August 3, 2010; U.S. State Department, "Background Note: Macau," July 26, 2010. They are included in this report only to the extent that firms or individuals from Hong Kong or Macau may play a role in IPR infringement in mainland China. See chapter 3.

[15] App. A.

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. The second report will be provided to the Committee by May 2, 2011.

The information and data in this first report were gathered from a wide variety of sources. The Commission held a public hearing for both reports on June 15–16, 2010. Witnesses during the two-day hearing included representatives of companies and trade associations located in the United States and China, as well as individuals with significant U.S. government, nonprofit, and academic experience. A diverse group of trade associations, law firms, think tanks, and companies also provided written submissions. Through more than 60 in-person and telephone interviews conducted in the United States and in travel to China, the Commission obtained information from additional companies, associations, academics, standards bodies, and other experts in the field.

Commission staff also consulted with U.S. government officials to gain insight from their expertise in Chinese IPR and indigenous innovation issues, including representatives of the Department of Commerce's International Trade Administration, the U.S. Patent and Trademark Office (USPTO), U.S. Customs and Border Protection (CBP), the Office of the U.S. Trade Representative (USTR), the National Institute of Standards and Technology, the Federal Trade Commission, the U.S. Department of Justice, and the U.S. embassy and consulates in China. Commission staff also reviewed published information on China's IPR and indigenous innovation policies and practices, including submissions made as part of the USTR's Special 301 review of the global state of IPR protection and submissions to the Intellectual Property Enforcement Coordinator (IPEC).[16] The Commission's review of data and information was complicated by the speed with which China's indigenous innovation and IPR policies are evolving, with new interpretations and policies issued frequently. The report includes published data and information available through September 2010.

Organization

This report is divided into six chapters. Chapter 1 provides definitions of key concepts and an overview of China's IPR enforcement structure. Chapter 2 describes the role of IP in the bilateral trade and investment relationship, focusing on three channels through which IP-sensitive goods and services flow between the United States and China: international trade, royalty and license fee services trade, and FDI. Chapter 3 describes reported copyright and trademark infringement in China, including affected industries and products, locations where piracy and counterfeiting are prevalent, the persons or groups involved, the methods by which the infringement may be carried out, and enforcement challenges. Chapter 4 provides similar information for patent infringement and trade secret misappropriation. Chapter 5 defines and describes major elements of China's indigenous innovation policies in the areas of government procurement, standards, and the enforcement of China's AML, among others. Chapter 6 outlines analytic frameworks potentially useful in determining the quantitative effects of IPR infringement and indigenous innovation policies in China on the U.S. economy.

[16] The office of the IPEC was created by Congress in the Prioritizing Resources and Organization for Intellectual Property Act of 2008 and is located within the Executive Office of the President, Office of Management and Budget. OMB, "About the Office of the IPEC," n.d.

Key Concepts: IPR and Indigenous Innovation in China

This section describes two key concepts in this investigation: IPR and indigenous innovation. With regard to IPR, the WTO Uruguay Round Agreements signed in 1994 included the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), and established comprehensive standards for IPR protection and enforcement in WTO member countries. China joined the WTO in December 2001 and assumed the obligations set forth in TRIPS.[17] It is important to recognize, however, that although TRIPS establishes standards for IPR protection and enforcement, the rights are granted and enforceable on a national basis.[18] For example, to receive patent protection in China, an inventor must satisfy the patent requirements contained in Chinese law, and a patent must be granted by Chinese authorities.[19]

The four principal types of IP reportedly infringed in China are copyrights, trademarks, patents, and trade secrets, according to the Commission's research and fieldwork.[20] The following definitions are based on Chinese law as generally described in the IPR toolkit prepared by the U.S. Embassy, Beijing.[21] An explanation of the concept of indigenous innovation follows the IPR definitions.

Copyrights

Copyrights generally encourage creative endeavors by prohibiting original works from being copied without the author's permission. China's Copyright Law protects a range of works, including written, oral, photographic, and dramatic works; fine art and architectural works; movies; graphic designs; and computer software. Under Chinese law, the copyright owner holds a broad set of exclusive rights, including the right to reproduce, distribute, perform, and adapt the work for a period of up to 50 years for corporate authors, or the life of the author plus 50 years for individual authors.[22] Copyright infringement, which may occur when any of the exclusive rights of the owner are violated, is sometimes referred to as copyright piracy. Copyrights do not have to be registered to be entitled to protection, although registration can facilitate enforcement.[23]

[17] See Final Act Embodying the Uruguay Round of Multilateral Trade Negotiations, Marrakesh, April 13, 1994, Annex 1C, 319, as reprinted by the U.S. Government Printing Office, 1994; Uruguay Round Agreements Act, Statement of Administrative Action, House Document 103-316, 103rd Cong., 2d Sess. (1994), 312, as printed by the U.S. Government Printing Office, 1994.

[18] U.S. Embassy, Beijing, "Intellectual Property Rights in China," n.d. (accessed August 5, 2010).

[19] Ibid.

[20] See also Congressional Research Service, "Intellectual Property Rights," February 5, 2009, 1–3; StopFakes.gov, "Intellectual Property: What Is It?" n.d. (accessed August 5, 2010); U.S. Embassy, Beijing, "Intellectual Property Rights in China," n.d. (accessed August 5, 2010). All these identify copyrights, trademarks, patents, and trade secrets as the major types of IPR. While other *sui generis* types of IPR covered by TRIPS obligations, such as plant variety protections and semiconductor design protection, may also be infringed in China, the Commission received little specific information with respect to them.

[21] U.S. Embassy, Beijing, "Intellectual Property Rights in China," n.d. (accessed August 5, 2010).

[22] Copyright terms are longer in the United States. For works created after 1978, protection lasts for the life of the author plus 70 years or for works made for hire, 95 years from first publication or 120 years from creation (whichever comes first). 17 USC Sec. 302.

[23] U.S. Embassy, Beijing, "Intellectual Property Rights in China," n.d. (accessed August 5, 2010); industry official, telephone interview by USITC staff, August 30, 2010; Maskus, *Intellectual Property Rights*, 2000, 45.

Patents

A patent generally provides a set of exclusive rights granted to the inventor for a limited time period.[28] Chinese law recognizes three kinds of patents: invention, utility model, and design (table 1.1). Invention patent applications (analogous to U.S. utility patents) are reviewed by a patent examiner to ensure that the invention is novel, is inventive, and has practical utility. Utility model and design patent applications are not substantively examined before the patent is granted; they are reviewed only for compliance with formalities. Utility model and design patents have a term of 10 years, compared to a 20-year term for invention patents.[29]

TABLE 1.1 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: 53.6% Foreign: 46.4%	Total grants: 32,382 Domestic: 99.4% Foreign: 0.6%	Total grants: 41,000 Domestic: 94.2% Foreign: 5.8%

Sources: U.S. Embassy, Beijing, and SIPO.

Utility model patents are sometimes known as "petty patents." Many countries (including Japan, Taiwan, Korea, and Germany) have petty patents that are not substantively examined or that require a lower standard of inventiveness for their grant. The United States, however, does not offer this type of patent protection.[30] Virtually all utility model and design patents in China are held by domestic patentees; non-Chinese firms rarely seek such protection in China. U.S. firms reportedly do not usually apply for utility model patents, in part because they are less familiar with them than invention patents.[31] Some U.S. firms, however, are reported to be developing patent portfolios in China that include all types of patents, particularly in light of well-publicized cases against foreign companies based on the alleged violation of Chinese utility model patents.[32]

Patent infringement in Chinese law refers to patent exploitation without the authorization of the patent owner, including manufacturing patented products; using patented processes; offering to sell or selling patented products; using products directly acquired

[28] China, like most other countries but unlike the United States, follows a first-to-file system under which priority for an invention is determined by the first application filed with the patent office rather than by the first to conceive of the invention.

[29] U.S. Embassy, Beijing, "Intellectual Property Rights in China: Trademarks," n.d. (accessed August 5, 2010). Like invention patents in China, utility patents in the United States have a 20-year term.

[30] Richards, "Utility Model Protection," 2010.

[31] Industry official, interview by USITC staff, Washington, DC, July 14, 2010; Weisun, "Intellectual Property Laws in China," 2010, 2.

[32] Industry official, interview by USITC staff, Washington, DC, July 14, 2010; industry official, interview by USITC staff, Shanghai, China, September 15, 2010. See chapter 4.

through patented processes for production or business purposes; and importing or exporting patented products or products directly acquired through patented processes.[33]

Trade Secrets

Trade secrets generally protect technical or business information that is unknown to the public and brings economic benefits to the owner, and for which the owner has adopted measures to maintain its confidentiality. As in the United States, trade secrets in China are not registered with an administrative agency. Instead, they are protected internally through procedures and steps taken by the owner to maintain secrecy, such as requiring employees or others to sign confidentiality agreements and limiting access to secret information through computer passwords and other preventive measures.[34]

The violation of trade secrets is generally referred to as misappropriation. Similarly to the United States, trade secret misappropriation in China includes obtaining trade secrets from the owner by improper means such as theft, promise of gain, or coercion, or disclosing, using, or allowing others to use trade secrets obtained through these improper means or through breach of an agreement or confidentiality obligation.[35]

Indigenous Innovation

The term indigenous innovation may be traced to China's Medium- to Long-Term Plan for the Development of Science and Technology (the MLP), released in January 2006, which calls on China to become an "innovation-oriented society" and a global leader in science and technology. The MLP introduced for the first time the term *zizhu chuangxin*. *Chuangxin* means innovation; *zizhu* has generally been translated as "indigenous," but also as "independent," "homegrown," or "self-owned."[36] The term *zizhu chuangxin* encompasses several policy goals of the Chinese government, including promoting the contributions of domestic companies to the Chinese economy rather than relying on foreign know-how and technology, building domestic R&D capabilities, and generally increasing the value that domestic Chinese companies contribute to the products and services they produce.

Some observers see a link between China's indigenous innovation policies and IPR infringement activity. In this view, China uses indigenous innovation policies to create an environment "that enables it to intervene in the market for IP, help its own companies to re-innovate competing IP as a substitute to American and other foreign technologies, and potentially misappropriate IP from U.S. and other foreign companies as components of its

[33] U.S. Embassy, Beijing, "Intellectual Property Rights in China: Patents," n.d. (accessed August 5, 2010). Other types of patent violations in China include patent passing off and patent counterfeiting. Commission fieldwork did not identify specific U.S. industry concerns in these areas.

[34] U.S. Embassy, Beijing, "Intellectual Property Rights in China: Trade Secrets and Unfair Competition," n.d. (accessed August 5, 2010).

[35] Trade secret misappropriation is included in China's unfair competition law, which also addresses passing off, trade dress infringement, and other types of violations. U.S. Embassy, Beijing, "Intellectual Property Rights in China: Trade Secrets and Unfair Competition," n.d. (accessed August 5, 2010).

[36] Cao, Suttmeier, and Simon, "China's 15-Year Science and Technology Plan," December 2006, 38, 40; foreign government official, telephone interview by USITC staff, July 9, 2010.

industrial policies and internal market regulations."[37] Potential connections between indigenous innovation and IPR infringement are discussed in Chapter 5.

IPR Enforcement in China

USTR and other U.S. government agencies generally consider the IP laws in China described above to be substantially TRIPS compliant.[38] It is the enforcement of these laws that is considered most problematic: China's enforcement regime "remains a major challenge" and has been described as ineffective and nondeterrent.[39]

IPR enforcement methods in China can generally be considered to fall into four categories: administrative enforcement, criminal prosecution, civil litigation, and customs enforcement.[40] Significant structural and institutional impediments reportedly hamper the enforcement capacity of the Chinese IPR system. These impediments include a lack of coordination among national agencies and between subnational authorities and the central government; inadequate training and resources for enforcement; and corruption and local protectionism.[41] Local protectionism refers to local Chinese governments' potential conflict of interest in enforcing IPR. Where counterfeiting industries are important contributors to the economy and jobs, local governments, which control the local markets, police, and judges, may have a strong incentive to overlook and protect infringement activities. As a result, criminal penalties are infrequently applied, and administrative and civil penalties are often weak and nondeterrent.[42]

Administrative Enforcement

IPR enforcement is most frequently pursued through administrative action in China, outside of the court system. While quick and inexpensive for the IPR holder compared to civil litigation, administrative enforcement has its limitations. Administrative enforcement is generally limited to injunctive relief, the seizure of infringing goods, and the imposition of small administrative fines; compensation for damages is unavailable,

[37] USITC, hearing transcript, Washington, DC, June 15, 2010, 171–72 (testimony of Jeremie Waterman, U.S. Chamber of Commerce).

[38] USTR, National Trade Estimate 2009, 100; USDOC, "Doing Business in China," 2010, 105.

[39] Ibid.

[40] See, for example, Lee and Murdock, "Enforcement in China," April 1, 2009. Other commentators categorize the enforcement mechanisms in different ways. Dimitrov (*Piracy and the State*, 2009, 12) states that "there are five different kinds of enforcement in China: judicial enforcement, three kinds of routine enforcement, and a campaign style enforcement." The categories in this chapter have been chosen because they best highlight the similarities to and differences from U.S. practice.

[41] USTR, National Trade Estimate 2009, 103; industry officials, interview with USITC staff, Washington, DC, August 2, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[42] Chow, "Organized Crime, Local Protectionism," 2003, 476–77; USITC, hearing testimony, June 15–16, 2010, 36–38 (testimony of Professor Daniel Chow); USDOC, "Doing Business in China," 2010, 106; Dimitrov, *Piracy and the State*, 2009, 156–58; industry officials, interview with USITC staff, Washington, DC, August 2, 2010; industry officials, interviews with USITC staff, Shanghai, China, September 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

and proceedings generally have little deterrent effect.[43] Although many agencies have the authority to levy administrative fines, those fines are paid to the agencies themselves and are not transferred to the IPR holder. Fines are usually low: one industry representative tracked nearly 800 IPR administrative actions between 2005 and 2009 and found that in fewer than half of administrative actions were fines awarded at all, and when awarded the fines averaged approximately $2,500.[44]

More than a dozen Chinese agencies have administrative jurisdiction over IPR protection. At least six agencies share in trademark enforcement.[45] Some focus on sector-related public health and safety, while others, such as the State Administration for Industry and Commerce, are generalists tasked with enforcement of trademark counterfeiting laws more broadly. Copyright enforcement is handled by several agencies as well, including the National Copyright Administration of China. The State Intellectual Property Office of China (SIPO) has the authority to handle patent invalidation and patent counterfeiting in administrative proceedings. The overlapping and complicated jurisdiction of the myriad agencies with an IPR function is often described as inefficient and counterproductive.[46]

Another problem noted with administrative proceedings is that officials have limited investigatory powers, requiring IPR holders to conduct substantially all investigative work themselves, a process that can be expensive and difficult, especially for smaller companies.[47] Moreover, IPR holders often complain that administrative crackdowns result in only temporary closures of production or other facilities, and that penalties are not serious enough to deter repeat offenders.[48] Seized or confiscated products can return to the market, and it is difficult to seize equipment used to produce counterfeit products.[49] Infringers reportedly view administrative seizures and fines merely as a cost of doing business, and even increase production totals to account for the risk of seizure.[50]

Criminal Prosecution

Certain acts of trademark counterfeiting, copyright piracy, and trade secret theft are crimes under Chinese law; patent infringement is not a criminal offense in China or the

[43] Lee and Murdock, "Enforcement in China," April 1, 2009; USITC, hearing testimony, June 15–16, 2010, 39 (testimony of Professor Daniel Chow); International AntiCounterfeiting Coalition (IACC), "Submission: Special 301 Comments," February 18, 2010, 23; industry officials, telephone interviews with USITC staff, July 13 and 14, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[44] Industry official, email message to Commission staff, September 25, 2010.

[45] Dimitrov, *Piracy and the State*, 2009, 188.

[46] Dimitrov, *Piracy and the State*, 2009, 144–45, 186; see also USTR, *2010 Special 301 Report*, 2010, 23; IACC, "Submission: Special 301 Comments," February 18, 2010, 7.

[47] IACC, "Submission: Special 301 Comments," February 18, 2010, 23; USITC, hearing testimony, June 15–16, 2010, 179 (testimony of Christian Murck, president, American Chamber of Commerce in China); industry official, interview by USITC staff, Washington, DC, August 2, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010.

[48] IIPA, written submission to the USITC, July 9, 2010, 23; industry official, interview by USITC staff, Washington, DC, July 1, 2010; industry officials, telephone interview by USITC staff, July 9 and 13, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010.

[49] Sun, *Evolving and Unique Nature of Chinese IP Law*, July 2009; industry official, telephone interview by USITC staff, August 3, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[50] USTR, *2010 Special 301 Report*, 2010, 21; USITC, hearing testimony, June 15–16, 2010, 40 (testimony of Professor Daniel Chow).

United States.[51] The boundaries for criminal IPR offenses in China are narrowly drawn. For example, there is no end-user liability for criminal copyright piracy in China, which prevents some enterprises that engage in massive IPR infringement—by using illegal copies of business software, for instance—from being criminally liable for that infringement.[52] Criminal copyright liability requires a for-profit motivation, and criminal trademark liability may require the use of identical trademarks.[53]

The laws themselves are often vague as to the thresholds at which IPR violations become criminal, although judicial authorities purported to clarify the thresholds in 2004 and 2007.[54] According to judicial guidelines, trademark infringement can be criminal where the counterfeit goods are worth more than RMB 50,000 ($7,497) or there are illegal gains of more than RMB 30,000 ($4,498).[55] Copyright infringement may be criminal when these same thresholds are met and when more than 500 copies of a work are distributed. Trade secret theft may be criminal when the harm caused exceeds RMB 500,000 ($74,969).[56] The guidelines have not led to an increase in the number of criminal prosecutions; industry representatives express concern that the guidelines are not sufficiently clear or consistently enforced, and that the value and volume thresholds at which police will actually start criminal investigations are too high.[57]

Criminal IPR cases are still relatively rare in China, despite some high-profile cases that have arisen as a result of coordinated effort with the U.S. Federal Bureau of Investigation (FBI) and other international law enforcement agencies.[58] Although criminal cases theoretically can be self-initiated by the police or can be brought to court through private prosecution, criminal IP cases in China are almost always transferred from an administrative agency to the police. However, agencies reportedly are disinclined to transfer cases, in part because they may keep administrative fines but not criminal fines.[59] For example, less than 1 percent of trademark cases were transferred from administrative agencies to the criminal system each year during 2005–07.[60] Once the police receive the case, they must transfer it to the procuratorate (similar to a prosecutor), who decides

[51] U.S. Embassy, Beijing, "Intellectual Property Rights in China: IPR Toolkit," n.d. (accessed August 5, 2010).

[52] IIPA, written submission to the USITC, July 9, 2010, 9; USTR, *2009 Report to Congress on China's WTO Compliance*, December 2009, 85.

[53] USTR, *2009 Report to Congress on China's WTO Compliance*, December 2009, 85.

[54] Supreme People's Court and Supreme Procuratorate, "Interpretation on Several Issues," April 5, 2006; WTO, "China–Measures Affecting IPR," January 26, 2009.

[55] Based on the 30-day average exchange rate (October 13–November 12, 2010) reported in IMF, IMF Exchange Rate Database.

[56] Supreme People's Court and Supreme Procuratorate, "Interpretation on Several Issues," arts. 1, 3, 5 and 7, April 5, 2006; WTO, "China–Measures Affecting IPR," January 26, 2009, 82–87.

[57] Dimitrov, *Piracy and the State*, 2009, 150–51; USTR, *2009 Report to Congress on China's WTO Compliance*, December 2009, 85; USTR, *2010 Special 301 Report*, 2010, 20; IACC, "Submission: Special 301 Comments," February 18, 2010, 7; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010. Moreover, recent guidances from Chinese law enforcement agencies reportedly have not affected actual criminal enforcement in China. SIPO, "China Lowers the Threshold," June 12, 2010.

[58] See chapter 3 discussion of high-profile copyright and trademark enforcement cases; USITC, hearing transcript, June 16, 2010, 338–39 (testimony of Chris Israel, PCT Government Relations).

[59] Dimitrov, *Piracy and State*, 2009, 147–48, 157–58; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[60] SIPO, *China IPR Annual Book 2009*, 2010; SIPO, "China's Intellectual Property Protection," 2010.

China's civil IPR litigation is dominated by domestic parties; only about 4 percent of cases reportedly involve foreign parties.[64] Systemic concerns about the limitations of the Chinese system may play a role in foreigners' infrequent use of the courts. One often-mentioned concern relates to the lack of independence of the Chinese courts, which report directly to the central or local governments and where judges are elected, reappointed, paid, and removed by the legislatures.[65] Due to this connection, it is reportedly common for judges to follow instructions from the local government in particular cases.[66] There is also concern that the Communist Party exerts subtle control over the outcomes of cases deemed sensitive by the government.[67] Industry representatives further report that they are reluctant to seek relief for infringement against Chinese state-owned enterprises (SOEs), both because of the risk that the judiciary or administrative authorities, reacting to political pressure, will deny relief, and because of the fear of government retaliation.[68] Meanwhile, it is often perceived as fruitless to pursue smaller infringers, who can disappear and set up shop elsewhere or under a different name even if the IPR holder prevails.[69]

Industry representatives report a number of procedural difficulties with China's IPR civil litigation system. First, there is no robust system for evidentiary discovery; litigants cannot require the other side to produce evidence in its possession.[70] The lack of discovery poses substantial problems for IPR holders.[71] For example, without the ability to compel a defendant to disclose information about its production processes, method patents—while issued in China—are virtually impossible to enforce.[72] The lack of discovery is exacerbated by the Chinese courts' lack of power to hold uncooperative defendants in contempt or, where such power exists, the refusal to exercise it.[73] Therefore, there is concern that Chinese defendants, particularly smaller defendants, can commit perjury and falsify records without risk of punishment. Such activities hamper

[64] Supreme People's Court, "Intellectual Property Protection," April 2010. It is unclear how the Supreme People's Court defines cases that involve foreign parties. For example, cases brought in the name of a joint venture partner or foreign-invested enterprise may not be included in this statistic. Industry official, telephone interview by USITC staff, August 30, 2010. A recent survey conducted by a firm that assists IPR holders with management and enforcement of their IPR in China showed that approximately ten percent of Chinese IP cases with published judicial decisions involved foreign firms, almost always as plaintiffs. Rouse, "CIELA: China IP Litigation Analysis," 2010.

[65] Zhang, "International Civil Litigation in China," 2002, 59, 94; Von Lewinski, *Copyright Throughout the World*, 2009, sec. 8.46(6) (noting also that "in financial respects, the local courts are highly dependent on the local governments"). See also Waterman, written testimony to the USITC, June 15, 2010.

[66] Zhang, "International Civil Litigation in China," 2002, 94.

[67] Von Lewinski, *Copyright Throughout the World*, 2009, sec. 8.46(6); Castellucci, "Rule of Law with Chinese Characteristics," 2007, 35, 50–51; industry officials, interviews by USITC staff, Washington, DC, July 15 and August 2, 2010; industry officials, telephone interviews by USITC staff, May 27, July 9, July 27, and August 3, 2010.

[68] Industry officials, telephone interviews by USITC staff, July 9, 22, 29, and August 3, 2010; Waterman, written testimony to the USITC, June 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010. See also Zhang, *International Civil Litigation in China*, 2002, 91.

[69] Industry officials, telephone interviews by USITC staff, July 22, 29, and August 3, 2010; Industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[70] Sepetys and Cox, "Intellectual Property Rights Protection," 2009, 6; Duncan et al., "A Comparison between the Judicial and Administrative Routes," 2008, 535.

[71] Industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[72] Industry official, telephone interviews by USITC staff, July 22 and 29, 2010.

[73] Industry officials, telephone interviews by USITC staff, July 22, 27, and 29 and August 3, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010.

the ability of IPR holders to prove their case and to prove damages.[74] Foreign firms also are disadvantaged by onerous Chinese requirements that all evidence obtained abroad be notarized in the country in which it was obtained and then forwarded to the Chinese embassy in the foreign country for legalization.[75] Such requirements impose significant cost and delay, and can make the presentation of documentary evidence from abroad extremely difficult.[76]

Industry representatives also report that civil cases in China offer ineffective remedies. For instance, civil damages in IPR suits when awarded are low. A recent survey found median damages of approximately $7,500 in civil actions brought by foreigners in Chinese courts from 2006–09.[77] Damages often are based on lost profits, which can be difficult to prove if Chinese counterfeits and other infringing products are sold at lower prices than the IPR holder's products, or through less formal channels.[78] Absent proof of lost profits, Chinese law generally permits recovery of the infringer's unjust enrichment, but the lack of discovery makes the infringer's profits difficult to determine and obtain.[79]

Even when plaintiffs prevail in civil actions, they may face obstacles. Damage awards are difficult to execute, especially when the defendant's assets are located in a different province from the court.[80] Although China's courts have the power to issue preliminary and permanent injunctions, there is some concern that they are increasingly hesitant to award such relief.[81] Even if a court were to award injunctive relief in favor of an IPR holder, the effect of such relief is often questionable, given that Chinese courts lack contempt power to punish noncompliance with an injunction.[82]

Notwithstanding the difficulties faced by foreign firms seeking to enforce their IPR in Chinese courts, some industry representatives are optimistic. They observe that the Chinese judicial system has improved dramatically since China's accession to the WTO in 2001, and express confidence that the courts will further improve with more time and experience.[83] This optimism is most frequently expressed with regard to courts and

[74] Industry officials, telephone interviews by USITC staff, July 22, 27, and 29, and August 3, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[75] Von Lewinski, *Copyright Throughout the World*, 2009, sec. 8.46(b) (citing Rule 11 of the Supreme People's Court's *Several Provisions on Evidence in Civil Proceedings*).

[76] Cutshaw, Burko, and Wagner, *Corporate Counsel's Guide to Doing Business in China*, 2009, sec. 24.9 (3d ed.); industry officials, telephone interviews by USITC staff, July 27 and 29, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[77] Rouse, "CIELA: China IP Litigation Analysis," 2010. The median recovery to foreigners was higher for patent cases (approximately $14,000), trademark cases (approximately $12,000), and unfair competition cases (approximately $13,000) and substantially lower for copyright cases (approximately $4,500).

[78] Industry officials, telephone interviews by USITC staff, July 22 and 29, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010.

[79] Yasong and Connor, "An Overview of the Judicial Protection," 2008, 163, 172; Duncan et al., "A Comparison Between the Judicial and Administrative Route," 2008, 535; industry officials, telephone interviews by USITC staff, July 22 and 29, 2010.

[80] Industry officials, telephone interviews by USITC staff, July 22 and 29, 2010.

[81] Industry official, telephone interviews by USITC staff, July 27 and August 3, 2010; industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010.

[82] Industry officials, telephone interviews by USITC staff, July 22 and 29, 2010.

[83] Industry officials, telephone interviews by USITC staff, July 22 and August 3, 2010; industry officials, interviews by USITC staff, Shanghai, September 15, 2010; industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

judges in major cities, such as Beijing and Shanghai; it is reportedly more difficult to find experienced judges and predictable procedures in Western provinces.[84]

Customs Enforcement

Unlike the United States, where CBP's IPR responsibilities focus solely on keeping out infringing imports, in China the General Administration of Customs (GAC) primarily focuses on preventing the export of infringing goods.[85] Accordingly, foreign rights holders can use customs authorities in China to prevent the export of infringing merchandise.

For copyright and trademark enforcement, an IP owner can invoke customs protection in China in two ways. First, the owner can alert the GAC to a known infringing shipment, which will then be detained if the IP owner satisfies a bonding requirement.[86] More commonly, for a nominal fee the owner may record his or her IP in a database that assists the GAC in identifying infringing goods.[87] According to several industry representatives, the GAC has been proactive in encouraging IP owners to record and to assist in the identification of authorized suppliers so as to improve customs enforcement. Indeed, the value of infringing goods seized by the GAC has increased sharply in recent years.[88] However, customs enforcement in China apparently is still viewed as a second-best solution by IP owners: infringement continues, and only a small portion of infringing goods can be intercepted.

The United States challenged aspects of China's IPR enforcement system, including criminal thresholds and certain customs measures, in a recent WTO case (box 1.1).

BOX 1.1 Resolution of WTO Challenge to Certain China IPR Measures (DS362)

In April 2007, the United States filed a complaint under the WTO dispute settlement provision challenging certain Chinese IPR protection and enforcement measures in China, alleging that the measures are inconsistent with China's obligations under the TRIPS Agreement. The United States challenged, among other things, China's lack of criminal procedures and penalties for commercial-scale counterfeiting and piracy in China; compulsory customs measures that permit seized goods to be released into the channels of commerce; and China's denial of copyright and related rights protection and enforcement to creative works of authorship, sound recordings, and performances that have not been authorized for publication or distribution within China.

In a report circulated on January 26, 2009, the dispute settlement panel concluded that certain provisions of China's copyright law and customs measures are inconsistent with the TRIPS Agreement and recommended that China bring them into conformity with its obligations under the TRIPS Agreement. The WTO Dispute Settlement Body (DSB) adopted the panel report on March 20, 2009. On June 29, 2009, China and the United States agreed that China should implement the DSB's recommendations and rulings by March 20, 2010. On March 19, 2010, China notified the DSB it had done so.

Sources: USITC, *Year in Trade 2009*, 2010; WTO, "China–Measures Affecting IPR," January 26, 2009.

[84] Industry officials, interviews by USITC staff, Shanghai, September 15, 2010.
[85] Zhang, "International Civil Litigation in China," 2002, 72, 92.
[86] Lee and Murdock, "Enforcement in China," April 1, 2009.
[87] Dimitrov, *Piracy and the State*, 2009, 78.
[88] In 2009, the GAC seized goods valued at RMB 450 million (approximately $67 million), a 350 percent increase over the value of 2005 seizures. SIPO, *China IPR Annual Book 2009*, 2010; SIPO, "China's Intellectual Property Protection," 2010.

CHAPTER 2
U.S.-China IP-Related Trade and Investment

This chapter provides context for the broader U.S.-China trade and investment relationship as it relates to IP and innovation. It also describes the three primary channels by which IP-sensitive goods and services are traded: international trade of merchandise goods (such as advanced technology products); royalty and license fees; and foreign direct investment (FDI).

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

The U.S.-China IP-related trade and investment relationship is globally significant due to the magnitude of global innovation that originates from the United States and China's growing capacity for both IPR infringement and innovation in its burgeoning and internationally connected manufacturing sector.

U.S. Economic Strength and the Importance of Innovation

Over the past 30 years, the United States has produced a dominant 23–30 percent of the world's gross domestic product (GDP) when measured at market exchange rates.[1] Innovation has been key to sustaining this distinction: the U.S. Commerce Department has estimated that the creation of new products and processes in the United States, through capital investment and increased efficiency, has accounted for as much as three-quarters of the United States' average annual growth since the mid-1940s.[2]

Data on global research and development (R&D) expenditures and patents granted support the notion that the United States is one of the world's innovation leaders. For R&D—a broad measurement of long-term investment in innovation—the United States spent more than $407 billion in 2007.[3] This was more than what was spent in either Asia or the European Union (EU), and was roughly equivalent to the combined R&D expenditures of the next four most innovative individual countries: Japan, China, Germany, and France.[4] R&D expenditures in the United States as a share of the country's economic output have been around 2.5 percent over the past decade, higher than in comparable markets such as the EU (1.8 percent). It is also considerably higher than China's relative R&D spending, which has grown from 0.6 percent of GDP in 1996 to 1.5 percent of GDP in 2007.[5]

[1] The U.S. share of world GDP is approximately 20 percent in recent years when measured using purchasing power parity instead of market exchange rates (to account for the relative cost of goods and services), but remains higher than that of any other country. World Bank, World Development Indicators database (accessed June 1, 2010).

[2] Increased efficiency is often referred to as increases in total factor productivity. USDOC, "Patent Reform: Unleashing Innovation," April 2010; Aizcorbe, Moylan, and Robbins, "Toward Better Measurement of Innovation and Intangibles," January 2009.

[3] USDOC, BEA, National Accounts, Satellite Account Database (accessed September 24, 2010).

[4] National Science Board, *Science and Engineering Indicators*, 2010.

[5] Ibid.

The United States is also an important location for the filing and grant of patents—which are broad indicators of the usefulness of inventions. In 2008, the U.S. Patent and Trademark Office (USPTO) granted approximately 20 percent (157,772) of the 777,556 patents granted worldwide, second only to Japan (176,950). China was third, with approximately 12 percent of patents granted worldwide (93,706); however, patent grants in China have been growing at a faster rate than in any other region.[6]

China's Growing Manufacturing Capacity and IPR Infringement

China's economy represented 7 percent of world GDP in 2008, compared to only 2 percent at the inception of its market-oriented reform process in 1978.[7] China's economic growth averaged 10 percent in real terms between 1981 and 2007 alone,[8] faster than that of any other economy over the past three decades,[9] and has been largely driven by China's evolving role as a global manufacturer.

China as a Global Manufacturing Hub

China's economic growth has been largely export-led, fueled mainly by its manufacturing sector. Between 1985 and 2008, China's manufacturing exports increased from 26 percent to 93 percent of its merchandise exports,[10] attributable mainly to increases in the production of goods—such as consumer electronics, computers, and appliances—that were assembled in China using imported intermediate inputs.[11] Since the mid-1980s, China's abundance of lower-cost labor and tax incentives distinguished it as an attractive manufacturing source for the production and export of labor-intensive goods such as footwear, toys, and apparel.[12] Spurred by large FDI and technology inflows from foreign-invested firms in incentive zones and other conduits, China's manufactured goods have progressively become more technically sophisticated. The processing of these manufactured goods now accounts for 40 percent of China's total trade, and has helped bring it to the forefront of global production.[13]

China's emergence as a global manufacturer is likely to have increased its capacity for counterfeiting, given its burgeoning, increasingly sophisticated, and internationally connected manufacturing sector operating within a business environment broadly characterized as ineffective in IP protection.[14] Despite the benefits multinationals reap from producing in China, they also face an array of IPR infringement problems in their supply chain operations, including illegal transfers of product specifications and

[6] Approximately half (49 percent) of the U.S. patents granted were to domestic residents (that is, the official residence of the first named applicant on the original patent application was a U.S. resident). By contrast, in Japan, 86 percent of patents granted were to domestic residents, and in China, 50 percent were to domestic residents. WIPO, *World Intellectual Property Indicators,* 2010.

[7] On a purchasing power basis, China represented 11 percent of world GDP in 2008. World Bank, World Development Indicators database (accessed August 1, 2010).

[8] Economist Intelligence Unit, *Country Profile* 2009, 25.

[9] Bergsten et al., *China The Balance Sheet,* 2006.

[10] Kianian and Yi, "China's Emergence," Q4 2009; World Bank, World Development Indicators database (accessed August 1, 2010).

[11] Amity and Freund, "An Anatomy of China's Export Growth," April 6, 2007.

[12] Kianian and Yi, "China's Emergence," Q4 2009; WTO, "Trade Policy Review: China (2010)," 2010.

[13] WTO, "Trade Policy Review: China (2010)"; World Bank, World Development Indicators Database (accessed August 1, 2010).

[14] USTR, *2010 Special 301 Report,* April 2010, 19.

unauthorized overproduction of goods on "midnight shifts" (see chapter 3).[15] This IPR infringement reportedly has decreased multinationals' market shares and returns on R&D investment, both inside and outside of China.[16]

Multinationals with supply chain operations in China reportedly must compete against counterfeiters who are using increasingly sophisticated manufacturing capabilities, high-tech distribution channels, product differentiation (to better adapt to local preferences), and lower prices to gain domestic market share.[17] Moreover, strong demand from external markets for cheaper counterfeit products has eroded multinationals' market shares and R&D investment returns outside China.[18]

China's Transition Toward Greater Innovation

Despite the rapid progress China has made integrating into the global economy, the manufacturing stage of production in which it is dominant is typically associated with a limited share of the value of the final product and, consequently, profitability, as seen in the "smiling curve" in figure 2.1.[19] Upstream stages, such as R&D and product development, as well as downstream stages, which include marketing and services, are typically associated with greater profitability. Accordingly, many Chinese firms have attempted to strengthen their competitive positions by migrating to more profitable stages of production, as seen in the value chain migration section of figure 2.1.[20] Some multinationals have transferred certain higher-value functions to their Chinese partners, including basic R&D functions (associated with product development) and marketing and sales operations. This, however, still appears to be happening on a limited scale.[21]

China's indigenous innovation policies (see chapter 5) are, broadly speaking, seeking the same objective of transferring more of the profitable stages of production, such as R&D, to China. However, these policies are predominantly aimed at facilitating the development of domestic Chinese firms that work independently of multinationals' supply chain operations.

Growing Economic Engagement and the IPR Challenge

The U.S. and Chinese economies have become increasingly interdependent in recent years. During the first year of China's economic reforms in 1978, two-way trade (exports plus imports) was $1 billion, and China was the United States' 32nd-largest export market and 57th-largest source of imports.[22] By 2009, China was the United States' second-largest single-country trading partner based on two-way trade, and accounted for 14.5 percent of U.S. trade with the world. The United States' bilateral deficit with China

[15] United Nations Economic and Social Commission for Asia and the Pacific, "IP Infringement in the Supply Chain in China," July 2006.

[16] A.T. Kearney, "The Counterfeiting Paradox," n.d., 2005; Tse, et al., "Shan Zhai: A Chinese Phenomenon," 2009; PriceWaterhouseCoopers, *Redefining Intellectual Property Value*, 2005.

[17] Ibid.

[18] PriceWaterhouseCoopers, *Redefining Intellectual Property Value*, 2005.

[19] The "smiling curve" illustrates the concept of value-added along manufacturing supply chains, most notably in the IT-related manufacturing industry.

[20] Tse, *The China Strategy*, 2010.

[21] Branstetter and Foley, "Facts and Fallacies about U.S. FDI in China," August 2007.

[22] CRS, "China-U.S. Trade Issues," October 7, 2008.

Despite this increasing interdependence, IPR infringement in China remains a serious and costly problem for many U.S. firms. Weak IPR enforcement in China is estimated to have significant costs for the U.S. and the Chinese economies.[24] Ineffective IPR enforcement and the resulting infringement reportedly has led to reduced U.S. exports of IP-sensitive products and technologies and to lower profits for both U.S. firms operating in China and for U.S. firms that license IP to Chinese entities.[25] For example, according to USTR, high levels of counterfeiting and piracy in China, combined with ineffective enforcement, have led many U.S. firms to limit the marketing of their leading-edge products and technologies in China. [26] The weak IPR regime also is viewed as harming the Chinese economy by deterring IP-sensitive trade and investment as well as dampening domestic innovation. Both of these trends lower the productive potential of Chinese enterprises.[27]

Notwithstanding the deficiencies of the Chinese IPR system, the Chinese market is more important than ever for U.S. companies, primarily because of its size and growth potential.[28] While global manufacturers originally considered China an export platform for goods destined for advanced industrial countries, they now also consider it as an essential market for U.S. goods, a development largely attributable to China's rapidly growing economy. Moreover, both USTR and private sector representatives report that China's IP institutions are generally getting stronger, albeit slowly and with much room for improvement.[29]

U.S.-China IP-Related Flows

There are three primary channels by which IP-sensitive goods and services flow between the United States and China—international trade, royalty and license fee flows, and FDI.[30] The following discussion focuses on certain metrics that are available to measure these flows and, potentially, provide insights into the bilateral IP-sensitive trade and investment relationship.

Challenges to Defining IP-Sensitive Products

U.S.-China bilateral trade in IP-sensitive goods is difficult to measure. First, it is challenging to detail the scope of IP-sensitive goods and services. A broad range of products and services could be considered IP-sensitive; such goods 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. Moreover, it may be difficult to assess the role of IP in the production of goods and

[24] USITC, hearing transcript, June 15, 2010, 8, 18 (testimonies of Lee Branstetter, Carnegie Mellon University and Fritz Foley, Harvard Business School).

[25] USITC, hearing transcript, June 15, 2010, 9–10 (testimony of Lee Branstetter, Carnegie Mellon University).

[26] USTR, *National Trade Estimate* 2009, 75.

[27] USITC, hearing transcript, June 15, 2010, 9–10 (testimony of Lee Branstetter, Carnegie Mellon University); Hassan, Yaqub, and Diepeveen, *Intellectual Property and Developing Countries*, 2010, 18.

[28] Industry officials, interviews and telephone interviews by USITC staff, June–July 2010.

[29] USTR, *National Trade Estimate* 2009, 100; USITC, hearing transcript, June 15, 2010, 9–10, 20 (testimonies of Lee Branstetter, Carnegie Mellon University, and Fritz Foley, Harvard Business School); industry officials, interviews and telephone interviews by USITC staff, July 2010.

[30] Maskus, *Intellectual Property Rights*, 2000, 73–83; USITC, hearing transcript, June 15, 2010, 18 (testimony of Fritz Foley, Harvard Business School).

services. Certain observers comment that nearly all internationally traded U.S. products and services are IP-dependent.[31]

Scholarly practices in this regard vary. Testimony at the June 2010 USITC hearing revealed that some academic researchers identify IP-sensitive sectors by their higher utilization rate of formal IP instruments such as patents and copyrights, compared to non-IP-sensitive products.[32] Other studies have identified IP-sensitive sectors as technology-intensive industries characterized by high levels of R&D, worker productivity, and innovation.[33] Still other approaches focus on patent-, copyright-, and trade secret-intensive sectors; however, trademarked goods, which are subject to high levels of IPR infringement in China, are not ordinarily captured by these studies.

Table 2.1 provides examples of potential IP-sensitive sectors and products, based on information provided by U.S. industry representatives and researchers. Generally, IP-sensitive products can be categorized by type of IP protection (e.g., patents, copyrights, and trademarks).[34] However, identifying products and sectors by the principal type of IP instrument used can be problematic because there can be considerable overlap of IP instruments for particular products and sectors; many products rely on all types of IP.[35]

Merchandise Goods

Merchandise goods that are IP-sensitive may be characterized by advanced technological content, rapidly evolving technology, and/or significant quality differentiation.[36] These products cover a broad range of sectors, including high-tech patented goods, such as pharmaceuticals and semiconductors; trademarked products, such as alcoholic beverages and footwear; copyrighted materials, such as books and sound recordings; and products that are trade secret-intensive, such as food products using proprietary recipes.[37]

Advanced Technology Products

One possible proxy for defining IP-sensitive high-tech products is the classification system used by the U.S. Census Bureau (Census) for advanced technology products (ATPs). Census developed the ATP classification system to monitor trade in products

[31] USITC, hearing transcript, June 15, 2010, 61–63 (testimony of Bruce Lehman, International Intellectual Property Institute).

[32] USITC, hearing transcript, June 15, 2010, 63 (testimony of Lee Branstetter, Carnegie Mellon University); Siwek, "Engines of Growth," 2005, 5. Sectors include digital industries (software, computer and electronics; motion picture and sound recordings) as well as other patent-dependent industries (such as aerospace, automotive, and pharmaceuticals) and certain industries that support the transportation of these goods.

[33] In a study by NDP Consulting, IP-sensitive sectors are identified by a number of criteria: having a larger proportion of highly skilled labor paid higher-than-average wages; producing highly value-added products; investing to a greater degree in R&D and capital formation; and account for a greater share of exports than non IP-sensitive sectors. Pham, "The Impact of Innovation," April 2010, 3–6.

[34] For example, pharmaceutical and biotechnology products are highly patent-intensive; printed material and sound recordings are copyright-intensive; and food, beverages, apparel, and footwear are trademark-intensive.

[35] For example, computer software is both patent- and copyright-intensive. Moreover, certain trademark-intensive sectors, such as cigarettes, are also highly patent-and trade secret-intensive (cigarette filters and other materials used in the production of cigarettes are patent-intensive, while tobacco blending and flavoring methods are trade secret-intensive).

[36] Maskus, *Intellectual Property Rights*, 2000, 73.

[37] Ibid., 78.

the broad spectrum of these trademark- and copyright-protected products.[42] U.S. Customs and Border Protection (CBP) data on seizures of IPR-infringing goods from China provide some indication of the types of IP-sensitive goods that are counterfeited (trademark infringing) and pirated (copyright infringing), although most CBP seizures are for trademark infringement.[43]

According to CBP, China was the source of 79 percent of the counterfeit and pirated goods seized at the U.S. border in 2009. Hong Kong accounted for an additional 10 percent.[44] Footwear and apparel accounted for most of these seized products. Other categories of products seized were consumer electronics, computers/hardware, jewelry, pharmaceuticals, and media products (table 2.2).

TABLE 2.2 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.

CBP seizure data, however, offer only a partial picture of traded IP-sensitive goods and IPR infringement activities in China. In 2009, the total value of seized goods from China was only $205 million.[45] A problem with extrapolating the scale and nature of counterfeiting and piracy from CBP seizure data is that a substantial share of infringement involves products that are not easily identifiable as counterfeit through border inspections, and therefore are seldom intercepted by CBP. Furthermore, CBP focuses its enforcement efforts on IP recorded in its database and only a small fraction of active trademarks and copyrights are recorded with CBP.[46] Thus, CBP is more likely to seize counterfeit footwear with recorded trademarks than products with IP that is not recorded.[47] Resource constraints also substantially limit the number of inspections and seizures carried out by CBP.

[42] This lack of categorization precludes presenting trade data similar to those provided for ATP products.

[43] Government officials, telephone interview by USITC staff, July 22, 2010.

[44] Data are for fiscal year 2009. CBP, *Intellectual Property Rights Seizure Statistics*, October 2009, 12.

[45] For example, for media products, including sound recordings and movies, the value of Customs seizures was only $5.5 million, which does not reflect the value of media pirated in the Chinese market or the pirated media that is illegally exported from China to the United States and other global markets. Seizure statistics for other markets are discussed in chapter 3.

[46] Of an approximately 1.6 million active registered trademarks in the United States, approximately 26,000 are recorded with the CBP. Government officials, telephone interview by USITC staff, July 22, 2010; government official, email message to USITC staff, September 20, 2010.

[47] Industry official, telephone interview by USITC staff, June 27, 2010.

Moreover, CBP officers have the authority to seize products that infringe patents or misappropriate trade secrets only in very limited circumstances.[48] Thus, border seizures, while an important tool, provide very little indication of the range of products affected by patent infringement or trade secret misappropriation that are imported into the United States.

Royalties and License Fees

U.S. companies receive payments in the form of royalties and license fees from the transfer of IP to companies in China. U.S. government statistics provide data for certain categories of intangible assets for which IP owners receive compensation, including industrial processes; books, records and tapes; broadcasting services; general-use computer software;[49] and franchise fees (table 2.3).

TABLE 2.3 U.S. receipts from China and rest of world, royalties and license fees by type of intangible asset, 2004–08 (million $)

	Industrial processes	Books, records, and tapes	Broadcasting and recording of live events	Franchise fees	Trademarks	General-use computer software	Total
China							
2008	1,080	2	21	204	292	727	2,326
2007	831	3	20	156	231	605	1,846
2006	663	2	7	114	202	528	1,516
2005	159	5	1	21	28	71	285
2004	185	3	1	17	48	61	315
Rest of world							
2008	39,050	1,551	556	4,168	12,260	31,564	89,149
2007	35,960	1,497	538	3,739	11,534	28,621	81,889
2006	31,752	1,471	418	3,156	10,181	22,127	69,105
2005	6,321	684	241	672	1,422	6,184	15,524
2004	5,472	652	200	585	1,666	4,689	13,264

Source: BEA.

Note: Data since 2006 include receipts from affiliated and unaffiliated businesses. Prior to 2006, data reflect only receipts from unaffiliated businesses.

Stronger IPR protection is generally associated with larger royalty and license fee flows, because weak IPR protection means that payment of such fees is not enforced.[50] Most of the value of U.S. receipts of royalties and license fees from China is from affiliated businesses, which accounted for about two-thirds of payments in 2008.[51] In-house transfers of IP are generally less likely to result in the loss of valuable IP than arms-

[48] USITC exclusion orders issued under 19 U.S.C. § 1337 can result in the seizure of patent-infringing and trade secret-misappropriating goods. U.S. Customs, "Focused Assessment Program," December 2007. However, comparatively few such orders are issued. The USITC's issuance of an exclusion order will often result in voluntary compliance by the infringer, in which case CBP, as a practical matter, never becomes involved.

[49] Custom-designed software is not included in the BEA data. Government official, interview by USITC staff, August 9, 2010.

[50] Maskus, *Intellectual Property Rights*, 2000, 140–41; USITC, hearing transcript, June 15, 2010, 23 (testimony of Fritz Foley, Harvard Business School). See chapter 6.

[51] USDOC, BEA, "U.S. International Services, table 4," (accessed July 2010).

length transactions between unaffiliated firms.[52] However, it is reported that weak IPR protection in China not only dampens IP flows to unaffiliated firms but also deters the transfer of IP and royalty flows among affiliated firms.[53] Weak IPR protection may lead companies to withhold IP from foreign affiliates for fear that the employees of affiliates may leave the company and take valuable IP with them.[54]

According to official data, U.S. receipts from royalties and license fees from China on all categories of intangible assets expanded from $1.5 billion to $2.3 billion during 2006–08 (table 2.3).[55] Although U.S. receipts from China and the rest of the world followed a similar trend, expanding substantially in most asset categories, receipts from China represented a very small share of total U.S. receipts.[56] Notably, receipts from China on copyrighted materials—books, records, and tapes ($2 million in 2008)—were essentially static during the period, compared to rapid growth in receipts from the rest of the world. This may partially reflect IPR infringement and market access problems in China for these copyrighted materials. [57]

Foreign Direct Investment

U.S. companies whose products contain IP-sensitive content also channel capital, technology, and related assets through FDI.[58] Weak IPR protection in China reportedly depresses the level of U.S. FDI in China.[59] Even though the stock of U.S. investment in China has been increasing in recent years, reaching $49 billion in 2009 (figure 2.5), U.S. FDI in China accounted for a relatively small share (1.4 percent) of the total $3.5 trillion stock of outbound U.S. investment.[60] According to the Chinese Ministry of Commerce (MOFCOM), the United States was China's fifth-largest FDI provider in 2009, accounting for 4 percent of total FDI.[61] There are no official U.S. or Chinese data on exclusively IP-sensitive FDI, but U.S. FDI in the manufacturing sector, which includes

[52] USITC, hearing transcript, June 15, 2010, 23 (testimony of Fritz Foley, Harvard Business School).

[53] Branstetter, Fisman, and Foley, "Do Stronger Intellectual Property Rights Increase International Technology Transfer?" 2006, 2; USITC, hearing transcript, June 15, 2010, 22–23 (testimony of Fritz Foley, Harvard Business School).

[54] USITC, hearing transcript, June 15, 2010, 22–23 (testimony of Fritz Foley, Harvard Business School); industry officials, interviews by USITC staff, Shanghai, China, September 15, 2010.

[55] As noted in table 2.3, before 2006, the BEA did not collect data on receipts from affiliated businesses, so longer-term statistical trends of this data are not discussed. According to a number of scholars, BEA data likely underreport the level of receipts of royalties and license fees paid to U.S. parent companies from foreign affiliates. Given the very large value of U.S. firms' foreign affiliate sales, "the reported flows fall far short of a full and complete accounting of all the benefits conferred on affiliates by access to the intellectual assets of the parent." This may be the result of underreporting by firms to reduce tax liability, as well as the raising of reporting thresholds by BEA for key survey instruments (much of the data collected by BEA is based on surveys). Feenstra et al. "Report on the State of Available Data," August 2010, 22–23.

[56] According to USITC hearing testimony, "these figures may seem small compared to total U.S. [receipts]; however, these fees are likely to earn high margins for U.S. firms. They also represent a valuable source of earnings for the high technology sector in the United States." USITC, hearing transcript, June 15, 2010, 21–22 (testimony of Fritz Foley, Harvard Busness School).

[57] Market access restrictions by China on copyrighted materials are discussed in chapter 3.

[58] Maskus, *Intellectual Property Rights*, 2000, 120.

[59] U.S. investors have complained that weak IPR enforcement in China is an investment barrier. USTR, *National Trade Estimate* 2010, 81. Generally, stronger IPR protection such as patent reforms could lead to large increases in FDI. Maskus, *Intellectual Property Rights*, 2000, 141–42. See chapter 6.

[60] China ranked as the 19th-largest recipient of U.S. outbound FDI based on FDI stock levels in 2009. USDOC, BEA, International Economic Accounts: "Operations of Multinationals Abroad; U.S. Direct Investment Abroad."

[61] Excluding Hong Kong, Taiwan was the leading supplier of FDI based on value, followed by Japan and Singapore. MOFCOM, "China's Absorption of FDI," (August 2010).

U.S. M&A activity in China appears to be smaller than greenfield FDI in terms of the number and value of ventures. In most cases, U.S. M&A activity resulted in the acquisition of majority stakes by U.S. firms, including many acquisitions resulting in 100 percent U.S. ownership.[69] U.S. M&A activity in China spanned a variety of IP-sensitive sectors, including computers and semiconductor manufacturing, chemicals, pharmaceuticals, and plastics during 2006–10.[70]

As noted above, a significant share of U.S. FDI in China has been directed toward R&D. Table 2.4 shows selected R&D expenditures by U.S. affiliates in China. Although total R&D expenditures by U.S. affiliates nearly doubled to $1.5 billion from 2004 to 2008 (the latest year for which data are available), these expenditures were relatively small compared to total U.S. global R&D expenditures ($37 billion in 2008).[71] Reportedly, high levels of IPR infringement are a contributing factor to relatively low levels of U.S. affiliate R&D expenditures in China.[72]

TABLE 2.4 China: Research and development expenditures by U.S. affiliates (million $)

	2004	2005	2006	2007	2008
All industries total	575	668	759	1,141	1,517
Manufacturing total	539	574	590	922	1,180
Computers and electronics	466	([a])	453	752	965

Source: BEA.

[a]Suppressed to avoid disclosure of data of individual companies.

Manufacturing sectors accounted for the highest level of U.S. affiliate's R&D expenditures in China—$1.2 billion in 2008—consistent with the focus on manufacturing facilities of most U.S. investors.[73] China thus ranked only seventh in U.S. foreign affiliate R&D in manufacturing centers, placing below countries with relatively stronger IPR protection, such as the United Kingdom, Germany, and Japan.[74] Most R&D in the manufacturing sector was directed towards the IP-intensive computer and electronic products sectors.

Despite concerns about IPR infringement and indigenous innovation policies in China (discussed in chapters 3-5), U.S. industry representatives have stated that China is a critical growth market for U.S. exports and FDI. According to these sources, if U.S. firms were to refrain from operating in China, their global competitors would fill the void, leading to substantial revenue losses for U.S. companies.[75]

[69] Bureau Van Dijk, Zephyr M&A database. July 2010.

[70] Ibid.

[71] R&D expenditures outside the United States. USDOC, BEA, International Economic Accounts: "Operations of Multinationals Abroad; Financial and Operating Data."

[72] Branstetter, Fisman, and Foley, "Do Stronger Intellectual Property Rights Increase International Technology Transfer?" 2006, 2; Branstetter and Foley, "Facts and Fallacies about U.S. FDI in China," October 2007, 16–18.

[73] Manufacturing sectors include food, chemicals, primary and fabricated metals, machinery, computers and electronic products, electrical equipment, and transportation equipment. USDOC, BEA, "International Economic Accounts: Operations of Multinationals Abroad: Financial and Operating Data."

[74] USDOC, BEA, International Economic Accounts: "Operations of Multinationals Abroad; Financial and Operating Data."

[75] USITC, hearing transcript, June 15, 2010, 251–53 (testimony of Christian Murck, American Chamber of Commerce in China; Shaun Donnelly, National Association of Manufacturers; Jeremie Waterman, U.S. Chamber of Commerce); industry officials, interviews by USITC staff, May 12, 2010, June 2, 2010, July 2, 7, 15, and 22, 2010.

CHAPTER 3
Copyright Piracy and Trademark Counterfeiting in China

The costs—and risks—of developing new products that embody copyrights and trademarks are often high: a new software operating system, a major motion picture, athletic shoes, and the latest consumer electronics can cost millions of dollars to create and develop. However, the costs of reproducing imitations of copyrighted and trademark-protected goods are generally very low. The challenges reported by U.S. firms in dealing with copyright piracy and trademark counterfeiting in China resemble each other in the wide array of industries affected, the geographic concentrations of infringing activities and groups involved, the methods used, and the problems characteristic of administrative and judicial enforcement. Copyright piracy is discussed first in this chapter, followed by trademark counterfeiting.

Copyright Piracy in China

Creative industries contribute significantly to the U.S. economy, and their products account for a significant share of U.S. exports. By one estimate, in 2007, U.S. core copyright industries added $889 billion in value to the economy (equal to 6.4 percent of U.S. gross domestic product (GDP)) and generated $126 billion in exports.[1] Copyrights protect products of these industries from unauthorized reproduction, thereby enabling U.S. companies to generate revenue from the sale of creative works.[2]

Over the past decade, technologies that facilitate the distribution, reproduction, and consumption of creative works, such as the Internet and MP3 players, have become widely available in China. In the absence of well-established domestic creative industries or strong institutional copyright enforcement (and in the presence of high demand for foreign content), copyrights held by U.S. companies have been infringed or pirated at high rates in China.[3] U.S. industry representatives state that copyright enforcement by Chinese authorities is not sufficient to deter infringers.[4]

China's economy is growing rapidly, a factor that could both promote and deter copyright infringement. For the past decade, China has been regarded by governments and firms as a major global supplier of pirated goods (based on customs seizures data and other information sources).[5] However, the increased purchasing power of China's consumers is

[1] Siwek, "Copyright Industries in the U.S. Economy," 2009, 3–7.

[2] USITC, hearing transcript, June 15, 2010, 196 (testimony of Robert Holleyman, BSA); USITC, hearing transcript, June 16, 2010, 346 (testimony of Michael Schlesinger, IIPA).

[3] Montgomery and Potts, "Does Weaker Copyright Mean Stronger Creative Industries?" 2008, 253.

[4] Industry officials, interviews by USITC staff, Washington, DC, July 1–16, 2010; USITC, hearing transcript, June 15, 2010, 8 (testimony of Lee Branstetter, Carnegie Mellon University); USITC, hearing transcript, June 16, 2010, 338 (testimony of Chris Israel, PCT Government Relations). As an example of minor penalties for copyright piracy, one music industry official reports that damages awarded by civil courts to copyright holders against infringing online music providers are typically around $140 per infringed song. Industry official, interview by USITC staff, Hong Kong, September 21, 2010. By broad comparison, statutory damages in the U.S. range from $750 to $30,000 per infringed work. 17 USC Sec. 504(c).

[5] OECD, "The Economic Impact of Counterfeiting and Piracy," 2008, 79.

making it an important global market for both legitimate and pirated copyrighted goods. For example, China is now the world's second-largest market for personal computers (PCs), while its market for licensed PC software is the seventh-largest in the world (worth an estimated $2 billion in 2009).[6] This suggests both that software consumption in China is high in absolute terms, and that a significant portion of this consumption is met through piracy. However, while the overall size of China's software market is increasing, the share of pirated software within that market may be lessening slightly: rising levels of per capita wealth are also associated with lower software piracy rates, as consumers are more able to afford licensed software and domestic innovators are more likely to demand strong IP protections.[7] The Business Software Alliance (BSA) estimates that the PC software piracy rate in China decreased from 86 percent to 79 percent from 2005 to 2009,[8] while China's per capita gross national income (GNI) increased from $1,740 to $3,620.[9] According to BSA figures, a software piracy rate of 79 percent is average for lower-middle-income countries (such as China), but is high in absolute terms, as rates in countries above this income category are as low as 20 percent (United States).[10] In addition, the size of China's software market and the speed with which it is growing heighten the impact of piracy there.

This chapter describes copyright piracy in China, including the industries affected, the mechanisms by which piracy occurs, and the groups involved in distributing infringing materials. It also discusses recent developments in copyright enforcement in China and describes the market access restrictions that contribute to demand for pirated materials.[11]

Industries Affected by Piracy

The industries most affected by copyright infringement globally are movies, music, business software, entertainment software, and publishing. These core copyright industries[12] produce both physical and digital goods, and both forms are subject to infringement in China. Physical piracy involves the unauthorized transfer of copyrighted materials through the use of media such as CDs, DVDs, hard drives, or flash memory drives. Unauthorized copies of written materials may also be printed on paper. The global scale of physical infringement is suggested by the 79 million individual CDs, DVDs, and cassettes detained for suspected copyright violation by EU customs authorities in 2008, 68 percent of which originated in China.[13]

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[6] USITC, hearing transcript, June 15, 2010, 194 (testimony of Robert Holleyman, BSA).

[7] Shadlen et al., "The Political Economy of Intellectual Property Protection," 2005, 53. For example, one study found that a $1,000 increase in GNI per capita is correlated with a 1.01 percentage point fall in software piracy rates; see Yang et al., "Global Software Piracy," 2009, 278.

[8] BSA, "Seventh Annual BSA/IDC Global Software Piracy Study," May 2010, 15.

[9] The World Bank, World Development Indicators Database.

[10] BSA, "Seventh Annual BSA/IDC Global Software Piracy Study," May 2010, 15.

[11] Definitions of copyright and infringement under Chinese law are provided in chapter 1.

[12] Non-core copyright industries are those indirectly affected by copyright infringement, including transportation providers; manufacturers of blank CDs and DVDs, CD and DVD players, MP3 players, computers, photocopiers, and camcorders; retailers; and Internet and telecom providers. In some instances, these industries may be affected by infringement in different ways than the core copyright industries. For example, piracy is positively correlated with sales of blank optical discs; see IFPI, "Music Piracy Report," June 2001, 3.

[13] European Commission Taxation and Customs Union, "Report On EU Customs Enforcement of Intellectual Property Rights," 2009, 22. Additionally, in fiscal year 2009, U.S. Customs and Border Protection (CBP), which quantifies seizures by estimated domestic value, seized an estimated $11 million worth of media (including tapes and optical discs), $5.5 million of which originated in China. CBP, "Intellectual Property Rights Seizure Statistics: Fiscal Year 2009," October 2009.

Digital products of copyright industries include software, movie, music, and text files distributed over telecommunications networks to computers, mobile phones, and other devices.[14] Digital piracy refers to copyright infringement that does not involve physical media.[15] The supply chain for infringing digital content may begin, for example, with the "hacking" of an entertainment software file within hours of its official release; the file is then uploaded to a file-sharing network.[16] The scale of global digital infringement is difficult to calculate. However, in just one example, media measurement company BigChampagne estimated that the movie *Watchmen* was offered by peer-to-peer (P2P) users 17 million times worldwide in the first six months of 2009.[17] The popular PC game *Call of Duty: Modern Warfare 2* is reported to have been shared on P2P networks 4.1 million times in 2009 (compared to about 300,000 retail sales of the game).[18]

The copyright industries include a substantial number of small and medium-sized enterprises (SMEs). For example, small software developers are common in both the business software and video game industries. SMEs report facing additional challenges in seeking to enforce their copyrights: they often do not have the resources to conduct investigations into potential infringement, and pursuing legal action through the court system is more cost-prohibitive for them than for larger firms.[19] In addition, many smaller companies in the copyright industries distribute their products digitally. For instance, thousands of individual software developers create downloadable applications for mobile phones[20] and publish online games. Through digital distribution, a copyright holder may enter a market, such as China, without having any physical presence in that market. Enforcement against digital piracy can be particularly challenging due to the existence of decentralized global networks for infringing files,[21] and these challenges are likely compounded for companies that have no physical presence in the Chinese market.

Where and How Piracy Occurs

Physical Piracy

Infringing physical media are produced and consumed throughout China. Organized, large-scale production and distribution of infringing optical discs is especially common in the southern cities of Guangzhou and Shenzhen, which have been targeted by Chinese

[14] Mobile phones are an increasingly important way of consuming digital content; in 2007, an estimated 50 million mobile phone subscribers in China used their phones to access the Internet. CNNIC, "Statistical Survey Report on the Internet Development in China," January 2008, 13. Additionally, 2006 revenues for ringtones and other music used on mobile phones in China reached $703.2 million. See Yan, "Music Phone Wins But Mobile Music Loses in China," April 2007.

[15] See OECD, "Piracy of Digital Content," 2009, 12. "Digital" can also refer to the format in which media is stored, and in this respect physical products like CDs and DVDs are "digital"; however, for purposes of this report, "digital piracy" is used to refer specifically to piracy that happens via computers, the Internet, and mobile devices.

[16] Industry official, telephone interview by USITC staff, July 15, 2010.

[17] Greenberg, "The Year's Most Pirated Videos," August 5, 2009. Lawrence, "Bursting BigChampagne's Bubble," May 19, 2003. However, Lawrence points out that the popularity of files uploaded does not necessarily reflect the popularity of files downloaded.

[18] Plunkett, "Report: The Most Pirated Games of 2009," December 28, 2009. The console version sold 6 million copies and was downloaded 970,000 times, reflecting the greater difficulty in pirating console games due to the need to transfer the infringing file to a game cartridge or disc; see McWhertor, "Report: Modern Warfare 2 PC U.S. Retail Sales about 170,000 in November," December 14, 2009.

[19] USITC, *Small and Medium-Sized Enterprises*, July 2010, 3–15.

[20] NetCoalition and CCIA, "Response to the Intellectual Property Enforcement Coordinator," March 2010, 33.

[21] OECD, "Piracy of Digital Content," 2009.

authorities as major sources of infringing materials.[22] For example, a 2007 seizure of 1.6 million pirated discs in Guangzhou found 30 production machines in 11 warehouses, which could produce an estimated 300,000 pirated discs per day.[23] Entertainment software industry representatives indicate that video game copiers that facilitate the transfer of video games from the Internet to a game cartridge also are widely available in Guangzhou and Shenzhen and distributed from there to retail markets and shops throughout China.[24] Similarly, an industry report indicates that Guangzhou and Shenzhen, along with the northern Chinese city of Jinan, are major distribution hubs for video game consoles, the sale of which is illegal in China.[25] Distribution of illegal consoles leads to increased demand for infringing games, because licensed games for these consoles are not typically distributed in China.[26] Small-scale commercial production of pirated goods for local markets is also possible with inexpensive equipment, such as stand-alone DVD burners. The decreasing cost of this type of reproduction technology widens the production base of pirated goods and makes detection of suppliers more difficult.[27]

Infringing copies of academic textbooks are commonly found in and around universities throughout China. In 2007, the Chinese government imposed a fine of $12,000 on Tongji Medical College after finding thousands of copyright-violating textbooks in the college's textbook store.[28] Recent advances in digital scanning technology have facilitated high-quality photocopies of copyright-protected books, often indistinguishable from the originals.

Digital Piracy

Digitally infringing files (e.g., software, movie, and music files) are produced, distributed, and consumed through decentralized global networks. One industry representative estimates that a large share (perhaps 80 percent) of music piracy in China is digital, as demand for unauthorized physical copies is being displaced by the availability of pirated music online.[29] Similarly, the movie industry reports that the majority of its enforcement efforts in China are now focused on Web sites that distribute pirated content.[30]

The availability of digitally infringing files is correlated with overall Internet use. In China, the number of Internet users has grown at an average annual rate of 39 percent since 2001,[31] reaching an estimated 384 million users in December 2009.[32] Broadband penetration rates are about 28.7 percent in China (compared to an average world rate of 26.6 percent and a U.S. rate of 76.3 percent),[33] with the highest penetration rates in Beijing and Shanghai (46.6 percent and 45.8 percent, respectively, in 2007).[34] Internet

[22] USTR, *2007 Special 301 Report*, 2007, 47.
[23] Xinhua News Agency, "China Cracks Largest Ever CD, DVD Piracy Case," April 4, 2007.
[24] Industry official, e-mail messages to USITC staff, July 29–August 3, 2010. To assist enforcement efforts in these areas, there is now an optical disc forensics lab in Shenzhen, which helps identify the sources of infringing discs. Industry official, interview by USITC staff, July 1, 2010.
[25] Niko Partners, "2010 Annual Review and Five-Year Forecast Report," April 2010, 45.
[26] Industry official, interview by USITC staff, July 16, 2010.
[27] OECD, "The Economic Impact of Counterfeiting and Piracy," 2008, 273.
[28] AAP, "U.S., U.K. Publishers Applaud Chinese Crackdown on Textbook Piracy," January 17, 2007.
[29] Industry official, interview by USITC staff, Hong Kong, September 21, 2010.
[30] Industry official, telephone interview by USITC staff, October 1, 2010.
[31] Internet World Stats, "China: Internet Usage Stats and Population Report."
[32] CNNIC, "Internet Fundamental Data (by June 30, 2010)," retrieved July 10, 2010.
[33] Internet World Stats, "China: Internet Usage Stats and Population Report."
[34] CNNIC, "Statistical Survey Report on the Internet Development in China," January 2008, 14.

cafés are widespread in China, especially in rural areas, and it is reported that pirated versions of entertainment software are commonly pre-installed on café computers.[35] The Entertainment Software Association estimates that 240,000 Internet cafés in China use unlicensed or pirated copies of entertainment software.[36]

Digital content is frequently distributed through P2P networks, "cyberlockers," or media streaming.[37] P2P users typically install free software that allows computers to simultaneously download and upload content, and central Web sites provide search indices to help locate specific files on the computers of other users. P2P networks can include millions of computers distributed globally. Cyberlockers allow one user to store content on servers and then permit other users to access that content via hyperlinks. Streaming audio or video media is sent continuously in compressed form over the Internet to users who play or display the content in real time.[38] Examples of digital distribution methods popular in China include Xunlei and verycd (P2P); Rafile and 91files (cyberlockers); and Tudou and Youku (video streaming). In 2009, the top 10 search terms on Baidu, China's leading search engine, included both Youku and Xunlei.[39] Although infringing activity is believed to predominate, these methods also have legal applications, such as distributing open source software or public domain video.[40] One movie industry representative reports that, in the past year, there has been an effort on the part of some of the larger Chinese video Web sites to move toward distributing legal content.[41]

Search engines such as Baidu and Sohu also play a role in facilitating digital piracy by providing "deep links," or search results that link to third-party sites that contain infringing content; Pali Research estimated that 80 percent of all searches on Baidu in 2009 were for music files.[42] However, the legal liability of search engines for infringing content is contested. In 2010, a Beijing court, ruling on a lawsuit filed against Baidu and Sohu by members of the International Federation of the Phonographic Industry, found that Sohu was liable for copyright infringement, while Baidu was not. Baidu, unlike Sohu, reportedly removed links to sites with infringing content after receiving notification from content owners.[43]

Physical and digital distribution methods often overlap. Movies recorded in theaters can be transferred as digital files over the Internet and then burned onto optical discs. Web sites can be used to sell pirated physical goods such as software and video game

[35] Industry official, telephone interview by USITC staff, July 15, 2010.

[36] ESA, "IP Issues Map."

[37] IIPA, written submission to the USITC, June 3, 2010, 5.

[38] Other digital distribution methods include File Transfer Protocols, specialized newsreader clients like Usenet, and real-time communication protocols like Internet Relay Chat.

[39] Fu, "Top 10 Keywords in China 2009," December 28, 2009.

[40] It is difficult to measure the share of total digital infringement facilitated by each distribution method. The network traffic monitoring company Sandvine estimates that from 2008 to 2009 streaming traffic as a share of total global bandwidth usage increased from 12.6 percent to 26.6 percent, while P2P traffic declined from 31.6 percent to 20.4 percent. One possible reason is that P2P downloads have more risk of malware compared to media streaming. See Sandvine, "2009 Global Broadband Phenomena," January 13, 2010.

[41] Industry official, telephone interview by USITC staff, October 1, 2010.

[42] Farley, "Questioning Baidu's SEC Filings," September 10, 2009.

[43] Chan, "PRC's Baidu/Sohu Judgments Set Copyright Precedent," July 29, 2010. This distinction is referenced in Article 23 of the Regulation on Protection of Right to Network Dissemination of Information, which limits the liability of search engines that link to sites with infringing content, and was the basis for the court decision.

effectively, and reportedly had global sales exceeding $2 billion. Those convicted received jail terms of about 6 years.[48]

Business Enterprises

Business enterprises are a significant source of business software piracy in China due to a practice known as "underlicensing." Underlicensing occurs when a business installs legitimate software on more computers than is legally permitted under the terms of its license from the copyright owner. Microsoft founder Bill Gates has suggested that China is unique in that even some of its largest global enterprises intentionally use underlicensed software.[49] A particular area of concern is the use of underlicensed software by China's state-owned enterprises (SOEs), given that these enterprises comprise a significant portion of the market for business software. The business software industry reports that, while the government established a plan in 2006 to fully license the software used by SOEs, to date no mechanism has been established to ensure SOEs' compliance with these commitments.[50] Because of the growth of the Chinese market for business software in recent years, industry groups presently identify underlicensing among enterprises as the "principal and most damaging form of infringement to the business software industry."[51] This is in contrast to the enforcement focus just five years ago, when business software companies were primarily focused on stopping the export of high-quality pirated optical discs from China.[52]

Enforcement against enterprises often involves consultation between the rights holder and the business in order to persuade the business to purchase software licenses.[53] If these consultations are not effective, the copyright holder must decide whether to pursue a civil case, since enterprise end-user piracy generally is not viewed by the authorities as a crime in China.[54] Microsoft, for example, won a 2010 civil case against Dazhong Insurance Company (a company largely held by SOEs). In that case, a Shanghai court ordered Dazhong to pay $318,000 in damages to Microsoft for its use of approximately 900 unlicensed copies of Windows and Office software.[55] Microsoft called the case, which represented the company's first attempt to challenge underlicensed Chinese enterprises in the civil court system, its "biggest legal victory in China."[56] Given that the business software industry considers underlicensing to be so pervasive, it is likely that such cases will continue to be a focus of its enforcement efforts in China.

Universities and Libraries

Universities, libraries, and the communities surrounding them are a key source of publishing industry piracy in China. Academic books, especially high-value textbooks, are often photocopied and sold to students.[57] Some of these copies are very close

[48] Barboza, "Chinese Court Convicts 11 in Microsoft Piracy Case," December 31, 2008.

[49] Evans, "Global CIO: Bill Gates Blasts China over Corporate Software Piracy," September 25, 2009 (accessed August 16, 2010).

[50] IIPA, written submission to the USITC, July 9, 2010, 10.

[51] Ibid., 7.

[52] Industry official, interview by USITC staff, July 15, 2010.

[53] Ibid.

[54] IIPA, written submission to the USITC, July 9, 2010, 9. According to IIPA's written submission, the Supreme People's Court indicated in 2007 that distribution of protected software in itself qualifies as a crime. To date, however, enforcement authorities in China reportedly do not accept this position.

[55] Arent Fox LLP, "Two Interesting IP Victories in China."

[56] Chao, "China Company Plans to Appeal Microsoft Decision," April 23, 2010.

[57] IIPA, written submission to the USITC, July 9, 2010, 7.

reproductions of the original, with nearly identical covers and similar quality.[58] The shops producing these copies may be located on or near campuses (such as in the case of Tongji Medical College mentioned above); there have reportedly been instances in which production facilities are operated by the universities themselves.[59] In some cases, these copy shops are sophisticated business enterprises—reportedly, the most advanced "have stock lists of materials available, keep warehouses filled with merchandise, and use bar codes to organize inventory."[60] The problem also extends to libraries, which may "stock copies of illegally reproduced textbooks and reference books for use by patrons."[61]

Consumers

Internet-based distribution of pirated materials by consumers is a growing problem in China. Globally, digital piracy of music, movies, and video games is often driven by demand from Internet users who supply pirated materials in exchange for access to other infringing materials. For example, many P2P networks allow access only on the condition that consumers make their own files available for download by other network members.[62] In other cases, suppliers of infringing digital content require payment for access or earn revenue from advertising.

There is little specific information on the demographics of Chinese Internet users who access pirated materials. However, recent survey data on the characteristics of China's total base of Internet users, and the ways in which they access digital content, may be suggestive. In 2007, the China Internet Network Information Center estimated that 58 percent of Chinese Internet users were male, 32 percent were aged 18 to 24, and 75 percent lived in urban areas. Sixty-seven percent of Chinese Internet users accessed the Internet with home computers, while 34 percent used Internet cafés (some used both). Internet cafés were mostly used by young people and rural people (48 percent of rural users used Internet cafés). Once online, 87 percent of Chinese Internet users used "online music" applications, while 77 percent used "online video" applications. Seventy-one percent of total users had downloaded music in the last six months, while 22 percent had downloaded videos and an additional 44 percent had viewed videos on Web sites. Users in Beijing and Shanghai had the highest music downloading rates, and video downloading rates were highest among the highly educated.[63] The survey did not distinguish among these downloads based on copyright status. It is believed, however, that most such downloading is of copyrighted files.[64]

Copyright Enforcement Overview

Copyright enforcement in China typically occurs through one of four different mechanisms: antipiracy campaigns, administrative enforcement, civil court cases, and

[58] Trade Lawyers Advisory Group, "The Crisis in Intellectual Property Protection," May 2007, 56.

[59] Schroeder, statement to the House Committee on Ways and Means, Subcommittee on Trade, February 15, 2007, 2.

[60] Trade Lawyers Advisory Group, "The Crisis in Intellectual Property Protection," May 2007, 56.

[61] IIPA, written submission to the USITC, July 9, 2010, 19; see also Hull, "Publishing in China," July 2009.

[62] This creates unusual market dynamics; unlike other distributors of pirated materials, consumers on these networks may be motivated by social recognition instead of profit. OECD, "Piracy of Digital Content," 2009, 25.

[63] CNNIC, "Statistical Survey Report on the Internet Development in China," January 2008, 15, 17, 20, 31–32, 42, 55–56, and 79.

[64] IIPA, written submission to the USITC, July 9, 2010, 11, 13 (estimating that 99 percent of music digitally accessed was unlicensed).

when the relevant criminal liability thresholds have been met."[68] As a result, these centrally directed campaigns may have limited deterrent effect.

Second, there is the system of administrative enforcement. While many agencies in China have some responsibility for copyright enforcement, primary responsibility for administrative enforcement lies with the National Copyright Administration of China (NCAC). The NCAC has local offices throughout China that handle administrative enforcement within their jurisdictions, including conducting raids and assessing fines. However, administrative enforcement from the NCAC can reportedly be difficult for copyright holders to obtain. The NCAC has stated that it is more focused on education than on enforcement[69] and has encouraged copyright holders to use the civil court system instead, on the grounds that they are understaffed.[70] In addition, research suggests that the NCAC may be "especially unwilling to provide raids when foreign companies seek its assistance."[71] Finally, the cost of administrative enforcement has been rising and is now on par with that of pursuing a civil court case in many instances.[72]

A third venue for enforcement is the civil court system. Administrative enforcement typically offers quicker resolution than a civil court case, but due to the limitations of the administrative system described above and in chapter 1, civil court cases have become a more attractive alternative.[73] In particular, some foreign copyright holders report that they place less reliance on the administrative system and have instead turned to the civil courts to enforce their copyrights.[74] Copyright cases represent the largest category of IPR-related civil court cases; in 2009, the number of civil copyright cases accepted by Chinese courts rose nearly 40 percent from the prior year and was more than double the figure from 2005.[75]

Fourth, there is the system of criminal enforcement. Criminal cases may result from administrative proceedings or may be investigated independently. Criminal copyright cases are rare in China, but can be effective.[76] High-profile cases involving criminal copyright prosecutions include the "Tomato Garden" case (see below) and the cases resulting from the "Operation Summer Solstice" investigation (see above), both involving piracy of Microsoft software.

Recent Trends in Copyright Enforcement

This section provides information on three recent enforcement trends driven by Chinese policymakers and courts. While U.S. industry representatives generally report that stronger, more consistent copyright enforcement is needed in China, these three trends suggest that the Chinese government is, at least in some instances, willing to adopt new

[68] Dimitrov, *Piracy and the State*, 2009, 232.
[69] Ibid., 234.
[70] U.S. Department of State, U.S. Embassy, Beijing, "IPR Toolkit" (accessed August 11, 2010).
[71] Dimitrov, *Piracy and the State*, 2009, 235.
[72] Ibid.
[73] See chapter 1.
[74] Industry official, telephone interview by USITC staff, August 30, 2010. By contrast, in the movie industry copyright holders often use administrative measures to obtain temporary closure of retail shops selling pirated DVDs. Administrative procedures may allow authorities to close these shops on the basis of operating an unauthorized business. Industry official, telephone interview by USITC staff, October 1, 2010.
[75] SIPO, *China IPR Annual Book 2009*, 2010; SIPO, "China's Intellectual Property Protection in 2009," 2010; see also figure 1.1.
[76] Industry official, interview by USITC staff, Hong Kong, September 21, 2010.

methods to address piracy. It remains to be seen whether these recent trends are indicative of a sustained effort by Chinese officials to reduce piracy.

The Chinese government requires computers shipped to Chinese customers to come pre-loaded with a licensed operating system. This requirement took effect in 2006, and one industry representative estimates the percentage of PCs shipped with legal software increased from 20 percent to more than 40 percent by 2007.[77] However, industry representatives report two weaknesses in this measure: first, it is possible to load a computer with an inexpensive or free operating system, then replace it with a pirated copy of a higher-value operating system once the computer leaves the factory. One industry representative suggests that this may happen as often as 50 percent of the time.[78] Second, smaller, non-branded computer builders known as "white box" manufacturers are exempt from the requirement.[79] Computers from white box manufacturers capture 20 to 25 percent of the market in China.[80] Still, most sources acknowledge a modest decline in the software piracy rate in China in recent years, and some credit the operating system requirement for part of the improvement.[81]

There is a growing body of Chinese case law addressing Internet-based infringement. In the past few years, Chinese courts have ruled on several high-profile cases involving Internet-based piracy. In 2009, the Huqiu District People's Court in Suzhou ruled that operators of the "Tomato Garden" Web site violated copyrights belonging to Microsoft by providing online access to pirated Windows software (the software's authentication functions had been disabled by Tomato Garden). As a result, the illegal income of the company that provided access to Tomato Garden (Chengdu Gongruan Network Technology Co.) was seized, the company was fined $1.23 million, and two individuals were sentenced to jail for three and a half years and fined $147,000.[82] This case was also significant because it involved criminal prosecution of the site's operators rather than more common civil litigation or administrative enforcement. Also in 2009, the Graduate Management Admission Council (GMAC) won a civil court ruling in Beijing against Beijing Passion Consultancy, the operators of a Web site that provided access to copyright-protected test questions to students taking the Graduate Management Admissions Test (GMAT). The case was settled through civil court mediation and resulted in compensation of $76,000 for GMAC.[83]

Chinese officials have reportedly strongly enforced copyrights in cases that affect national interests, such as during the 2008 Olympic Games. By some accounts, China strongly enforced copyrights relating to online broadcasts of the Beijing Olympics. A group of organizations, including China Central Television (CCTV), NBC, and the International Olympic Committee, used digital "fingerprinting" technology from U.S.-based Vobile Inc. to automatically scan Web sites in search of unofficial videos.[84] On the enforcement side, a rapid response mechanism established jointly by the NCAC, Ministry of Public Security, and Ministry of Industry and Information Technology reportedly shut down or blocked 84 sites and ordered another 33 sites to stop infringing on broadcast

[77] Kirkpatrick, "How Microsoft Conquered China," July 17, 2007.
[78] Industry official, interview by USITC staff, July 15, 2010.
[79] IIPA, written submission to the USITC, July 9, 2010, 10.
[80] Ibid.
[81] BSA, "Seventh Annual BSA/IDC Global Software Piracy Study," May 2010, 15; industry official, interview by USITC staff, July 1, 2010.
[82] Foley and Lardner LLP, "2009–2010 Top Ten Chinese IP Cases," 2010.
[83] Damast, "Crackdown on China GMAT Cheating," December 3, 2009.
[84] Burrows, "Why China Is Finally Tackling Video Piracy," June 9, 2008.

copyrights.[85] Notably, NBC had made coverage of the Olympic Games globally available through legal outlets, including broadcast and cable television, video on demand, mobile phones, and live event coverage at NBColympics.com.[86] The widespread availability of legal broadcasts of the games likely reduced demand for unauthorized videos. Still, the Chinese government's success in protecting IP relating to the Olympic Games has led some observers to remark that "China, if it wishes to . . . has the capacity to wipe out piracy or counterfeiting of basically any product that it decides to."[87] Others have noted, however, that the success of this specific effort over a limited time period does not guarantee that replicating this success on a broader scale would be feasible or accepted as a top priority by Chinese authorities.[88]

The Impact of Market Access Restrictions

Market access restrictions and copyright infringement are closely linked because the absence of a legitimate market creates additional demand for pirated versions of copyrighted works. For instance, the sometimes lengthy content review process for legitimate video games and music means that pirated versions often make it into the Chinese market first, displacing sales of authentic copies.[89] Likewise, in the movie industry, China's limit of 20 foreign films for theatrical distribution each year means that, until a film is officially released on DVD, there is no authorized version available. Chinese consumers' immediate demand for these films can therefore be filled only by pirated copies (often obtained through the camcording of the film in other countries' theaters).

A significant market access barrier in copyright-intensive industries is China's system of content review. All films, publications, music, and home entertainment products must be reviewed for prohibited content before they may be released in China. Copyrighted content may be blocked from entry due to political considerations; for example, access to the iTunes online music store site was blocked in China for two weeks in August 2008 due to the presence of an album containing pro-Tibet songs.[90] Media may also be blocked for excessive violence or other objectionable content.[91]

Another market access barrier in copyright industries is China's restriction on foreign distribution of certain media. As noted above, in the movie industry, only 20 foreign films are generally approved for theatrical distribution in China each year under a revenue-sharing model, per the terms of China's accession to the WTO. In addition, in some copyright-intensive industries, foreign companies presently must have Chinese partners to distribute their content.[92] For example, foreign music companies must collaborate with a Chinese partner in order to acquire a publishing number, which is necessary for distributing music. The Chinese government also stipulates that only SOEs

[85] SIPO, "China's Intellectual Property Protection in 2008," April 27, 2009.
[86] Whitney, "NBC Faces Olympic Pirates," August 11, 2008.
[87] USITC, hearing transcript, June 16, 2010, 391 (testimony of Michael Schlesinger, IIPA).
[88] For further discussion, see Yu, "Three Questions That Will Make You Rethink the U.S.-China Intellectual Property Debate," 2008.
[89] Industry official, telephone interview by USITC staff, July 15, 2010; industry official, interview by USITC staff, Hong Kong, September 21, 2010.
[90] Fletcher, "China Blocks iTunes over All-star Tibet Album Free Download," August 22, 2008. Reportedly, China lifted the general block on iTunes while continuing to block access to the album. Van Buskirk, "China Reinstates: iTunes Access-minus Songs for Tibet," August 26, 2008.
[91] Industry official, telephone interview by USITC staff, July 15, 2010.
[92] Montgomery and Potts, "Does Weaker Copyright Mean Stronger Creative Industries?" 254; industry official, telephone interview with USITC staff, July 15, 2010.

can distribute music over the Internet.[93] Several of these measures were successfully challenged by the United States in a recent WTO case (see box 3.1).

BOX 3.1 China—Resolution of WTO Challenge to Certain Market Access Measures in China (DS363)

In 2007, the United States filed a complaint under the WTO dispute settlement provisions alleging that various Chinese measures—ones that reserve trading rights for certain publications and audiovisual entertainment products to Chinese state-designated and wholly or partially state-owned enterprises, as well as others that impose market access restrictions or discriminatory limitations on foreign service providers seeking to engage in the distribution of publications and certain audiovisual home-entertainment (AVHE) products—are inconsistent with China's WTO obligations.

In a report circulated on August 12, 2009, the dispute settlement panel concluded that certain measures were inconsistent with China's WTO obligations because they restricted the right of foreign enterprises and individuals in China to import reading materials, films, AVHE products, and sound recordings. The panel further found that various Chinese measures imposing requirements relating to registered capital and operating terms for the distribution of reading materials were also inconsistent with WTO obligations.

China and the United States appealed aspects of the panel report to the WTO Appellate Body. In a report circulated on December 21, 2009, the Appellate Body upheld most of the panel's conclusions. The Appellate Body report was adopted by the DSB at its meeting on January 19, 2010. China has agreed to implement the recommendations and rulings of the DSB by March 19, 2011. In light of these events, some of the distribution restrictions mentioned above may change in the near future. It should be noted that this decision pertains to China's import and distribution restrictions, not to its content restrictions or to its limit on the number of foreign films for theatrical distribution.

Source: USITC, *The Year in Trade 2009*, 2010.

In the entertainment software industry, an additional market access barrier is China's previously mentioned ban on game consoles, which has been in place since 2000.[94] Despite the ban, consoles are popular in China, but they enter only through illegal channels. Marketing of legitimate games is limited, so there is a thriving market for pirated games that are played on these consoles.[95] Pirated games can be played through the use of one of two devices: "game copiers" or "mod chips." Game copiers facilitate the transfer of game files from the Internet to a game cartridge, while mod chips are installed inside a console to allow the console to play pirated discs. One entertainment software company indicated that the growing use of game copiers in China was particularly worrisome, since game copiers provide a direct mechanism for using all of the infringing files available on the Internet.[96]

Foreign Industry Strategies for Operating in a High-Piracy Market

Some U.S. content companies have adopted strategies that may help build a market for their products, notwithstanding high rates of copyright infringement. Such strategies may mitigate some of the harm done by copyright infringement and allow content holders to better access at least a portion of the large Chinese market. In addition, some U.S. content companies maintain their presence in China, despite losses from piracy, in order to influence the long-term development of trends and tastes and/or to be in a position to benefit if copyright enforcement improves.[97] That some copyright holders find it

[93] USTR, "2009 National Trade Estimate Report on Foreign Trade Barriers," 2009, 114.

[94] Industry official, interview by USITC staff, July 16, 2010. The ban has the stated goal of protecting minors, although PC video games are legal.

[95] Industry official, interview by USITC staff, July 16, 2010.

[96] Ibid.

[97] Industry official, interview by USITC staff, June 21, 2010.

worthwhile to use such strategies despite high rates of infringement underscores the importance of the Chinese market to U.S. firms.

High rates of copyright infringement generally place downward pressure on prices for legitimate copyrighted goods, and many content companies lower prices on legitimate versions of goods in order to compete with pirated versions.[98] For example, in 2006 Warner Brothers started selling DVDs in provincial Chinese cities for about $1.85,[99] and the company also offers 60-cent movie downloads in a venture with Beijing-based Voole.[100] In 2008, Microsoft reduced the price in China of its Office 2007 Student and Home Edition from about $102 to $29.[101] Even with lower prices, legitimate works of authorship still cost more than pirated versions (a pirated copy of Office 2007 cost an estimated $1.50 in 2008[102]), but they can have substantial advantages over illegitimate copies. For example, legitimate movie DVDs are less likely to be low-quality camcorder versions, to have inaccurate subtitles or translated dialogue, or to be movies other than the movie listed on the package. Authentic software also may be less susceptible to malware than pirated software.

In some industries, firms and individuals may sell complements to copyrighted works—for example, musicians can earn revenue from live performances, which are complements to recorded music.[103] Widespread distribution of creative works, including through piracy, may increase these works' popularity, thereby expanding the market for such complements. However, market access and censorship issues can limit the ability of U.S. musicians to leverage their popularity gains from piracy in China.[104] For example, China has canceled Bob Dylan concerts for being "countercultural," blocked Oasis from touring due to the band's appearance at a Tibetan freedom concert,[105] and canceled shows by Jay-Z because of "vulgar lyrics."[106] Other examples of content-owning firms selling complements include entertainment software firms, which offer free downloads of their games but require payment for virtual accessories.[107]

Another business model that can be effective in environments with high piracy rates is to offer subscription-based access to copyrighted works. Many massively multiplayer online games, for example, charge monthly subscription fees and/or require prepaid game cards instead of one-time payments for software. Such games are amenable to subscription pricing because players need to access the game developer's server in order to play online games against other users. One example is *World of Warcraft*, developed by California-

[98] Bae and Choi, "A Model of Piracy," September 2006. However, it may be difficult to quantify price effects attributable only to IP infringement in the context of exchange rate effects, income levels, and other factors.

[99] AP, "China's Anti-Piracy War," July 7, 2006.

[100] Cheng, "Warner Bros. to Fight China Movie Piracy with 60 Cent Downloads," November 5, 2008.

[101] Reuters, "Microsoft Cuts Prices in China to Fight Piracy," September 22, 2008.

[102] Ibid.

[103] Times Online Labs, "Do Music Artists Fare Better in a World with Illegal File-sharing?" November 12, 2009. One economic model predicts that copyright infringement may decrease the earnings of "superstar" musicians but increase the total market share of young and niche artists. Pollstar data indicates that the combined ticket revenues of the top 20 tours declined by 15 percent from 2006 to 2007, while total North American concert ticket revenues increased 8 percent to $3.9 billion in that period. See Alcalá and González-Maestre, "Copying, Superstars, and Artistic Creation," August 2009, 12.

[104] Montgomery and Potts, "Does Weaker Copyright Mean Stronger Creative Industries?" 2008, 255.

[105] Walker, "China Blocks Bob Dylan Gigs," April 4, 2010.

[106] BBC News, "'Vulgar' Jay-Z Barred from China," October 11, 2006.

[107] One small U.S. entertainment software company regards piracy of its games in China as "free marketing" and an opportunity to build demand for its monetized virtual items. Industry official, telephone interview by USITC staff, July 15, 2010.

based Blizzard Entertainment and operated in China by licensees (including The9 and NetEase). The game has gained an estimated 5 million subscribers in China since launching in 2005, out of an estimated worldwide subscriber base of 12 million.[108] Niko Partners estimates that the online gaming industry in China achieved $3.7 billion in revenue in 2009 and predicts it will reach $4.5 billion in revenue in 2010.[109]

Trademark Counterfeiting in China

Counterfeiting in China has reached unprecedented high levels. In 2009, China was the source of 79 percent of the counterfeit goods seized at the U.S. border, with an additional 10 percent coming from Hong Kong.[110] The United States is not alone in tracing most counterfeit goods to China. In 2008, the World Customs Organization, reporting on data collected from 121 countries, found that 65 percent of detected counterfeit shipments came from mainland China.[111] Many U.S. companies doing business in China consider counterfeiting to be one of their most serious challenges and report that weak civil and criminal IP enforcement exacerbates the problem.[112]

The effects on trademark owners include lost sales and revenues, a tarnished brand name and reputation, and increased enforcement costs. The overriding concern for trademark owners is that their authentic, high-quality products will be priced out of the market in China and other countries by poor-quality, cheaper knockoffs.[113] Trademark owners frequently find that counterfeit products featuring their trademarks appear on the market in China before they have established IP rights or put in place a strategy for addressing infringement.[114]

The counterfeiting problem can be particularly difficult for SMEs. While all firms are affected by counterfeits, counterfeit products discovered for sale in China, over the Internet, and in international markets, place special burdens on SMEs because they have a smaller volume of sales over which to spread significant enforcement costs and often do not possess the experience and resources necessary to address counterfeiting in China.[115]

By way of example, a survey conducted by the Motorcycle Industry Council of 53 firms of varying sizes, including SMEs, found that many members do nothing to address IPR infringement in China because they lack knowledge about how to resolve the issue

[108] Haili, Shanshan, and Fang, "Warcraft Row," March 9, 2010; Blizzard Entertainment, "World of Warcraft Subscriber Press Release 12 million worldwide," October 7, 2010.

[109] Niko Partners, "Niko Partners Estimates China's Online Game Market to Reach $9.2 Billion in 2014," March 31, 2010.

[110] Data are for fiscal year 2009. CBP, *Intellectual Property Rights Seizure Statistics*, October 2009, 12.

[111] World Customs Organization, *"Customs and IPR Report 2008,"* 9.

[112] AmCham-China, written submission to the USITC, June 3, 2010, 3; KPMG, *Managing the Risk of Counterfeiting in the Information Technology Industry*, July 2005, 4; industry officials, interviews by USITC staff, Shanghai, September 15, 2010; and industry officials, interviews by USITC staff, Hong Kong, September 21, 2010.

[113] Horan, Johnson, and Sykes, "Foreign Infringement of Intellectual Property Rights," 2005, 35–36; UNODC, *The Globalization of Crime*, 2010, 173.

[114] USITC, hearing transcript, June 15–16, 2010, 189 (testimony of Shaun Donnelly, National Association of Manufacturers); Stewart and Stewart, written submission to the USITC, July 8, 2010; D'Addario, written submission to the USITC, May 24, 2010, 3; industry officials, interviews by USITC staff, Washington, DC, May 20, June 16, June 21, and August 2, 2010.

[115] Ibid.

successfully, are skeptical about the effectiveness of pursuing an adequate resolution, or are concerned about potentially significant costs.[116]

Industries and Products Subject to Counterfeiting

The range of industries and products affected by counterfeiting in China is vast, as virtually any good or service with a trademark can be counterfeited.[117] Goods with well-known brand names—especially luxury goods and pharmaceuticals, for which profit margins are greater—are prime candidates for counterfeiting. However, the high volume of trade for many commodity-type goods means that even goods with lower unit values and lower margins are profitable to counterfeit.[118] Table 3.2 provides examples of the wide array of U.S. industries and products that are reportedly targeted by counterfeiters, as well as the health and safety issues that are raised by counterfeiting in China.

TABLE 3.2 Examples of industries and products affected by counterfeiting in China

Industry	Description of infringement or issue
Aviation and aerospace parts	Counterfeit components illicitly certified as meeting military or aircraft standards reportedly have been installed in avionics.
Apparel	Counterfeit apparel may be made with lower quality construction or with unapproved/harmful dyes or chemicals.
All-terrain vehicles (ATVs) and motorcycles	Counterfeit vehicles do not meet federal safety standards or the ANSI/SVIA standard for ATVs. Parts, apparel accessories, and support material (handbooks and videos) are also counterfeited.
Automobile parts	Counterfeiters have focused on aftermarket parts, producing counterfeit goods with substandard parts/construction that are not built to design/safety standards and do not feature the quality or life expectancy of standard parts. Some counterfeit parts may be for only cosmetic uses, while others are structural or safety components, like brake pads. Original equipment manufacturers (OEMs), parts wholesalers, and repair shops may be unable to detect counterfeit goods. Counterfeit replacement and maintenance parts such as brake shoe/pads, wheel covers, oil and air filters, shock absorbers, fan belts, starters, and spark plugs are common. Counterfeits of windshields and wheel covers have also been discovered.
Book publishers and test publishers	Counterfeit books, both fiction and nonfiction, and academic tests are claimed to be the product of well-known authors or respected publishers.
Branded leather goods, including purses, luggage, backpacks, cigarette cases, eyeglass holders	Counterfeits of well-known brands have substandard parts/construction.
Branded spectacles and sunglasses	Counterfeits of well-known brands have substandard parts/construction.
Cigarettes	Cigarettes made with adulterated tobacco are sold with counterfeit labels.
Computer printer ink cartridges	OEM printer cartridges and the printer cartridge cores used by remanufacturers are counterfeited.

[116] Motorcycle Industry Council, written submission to the USITC, July 9, 2010, 5.

[117] Definitions of key terms, including trademarks and counterfeiting, are contained in Chapter 1. Counterfeit goods should be distinguished from "gray market" goods. Gray market goods are genuine; they carry a trademark applied with the approval of the trademark holder, but the approval is intended to apply to sale only to particular geographic markets. Goods bearing counterfeit marks, on the other hand, are not genuine; the marks have been applied without the authority of the trademark holder. CBP, "Trademark and Trade Name Protection," April 2002, 7. Concerns about gray market goods were not raised in Commission fieldwork.

[118] Stewart and Stewart, written submission to the USITC, July 8, 2010.

TABLE 3.2 Examples of industries and products affected by counterfeiting in China—***Continued***

Industry	Description of infringement or issue
Computers	Counterfeits of well-known brands have substandard parts/construction, with less-than-expected quality, longevity, or safety.
Consumer electronics, including but not limited to televisions, cameras, CD and DVD recorders/ players, MP3 players	Counterfeits of well-known brands have substandard parts/construction, with less-than-expected quality, longevity, or safety.
Diamonds	Advertising slogans and brands are copied.
Direct current (DC) power supplies	Counterfeit power supplies pose safety issues for the household appliance industry threatening fire, shock, or electrocution.
Dry batteries	Low-quality counterfeit batteries have exploded, harming equipment and operators.
Food and beverages	Misleading or counterfeit labels have unapproved or harmful ingredients.
Footwear	Counterfeits of well-known brands have substandard parts/construction.
Ground fault circuit interrupter (GFCI) electrical wall outlets	Counterfeit GFCI wall outlets are made without the advertised safety features, threatening fire, shock, or electrocution.
Golf clubs and other sporting goods	Counterfeits of well-known brands have substandard parts/construction that may fail in use.
Health and personal care products (hair dryers, curling irons)	Counterfeits of well-known brands have substandard parts/construction, with less-than-expected quality, longevity, or safety. Users face the risk of fire, shock, or electrocution.
Household care products, Including soaps and detergents	Counterfeit goods that are less effective or harmful when compared to the authentic good.
Information technology (IT) network routers and computers	Counterfeit networking equipment has been purchased by U.S. government agencies, defense contractors, branches of the armed forces, universities, financial institutions, and electric utility companies, among others. Counterfeit equipment may cause unexpected network failures and could leave secure systems open to attack.
Jewelry and watches	Counterfeits of well-known brands have substandard parts/construction.
Medical goods	Counterfeit in-vitro diagnostic equipment, contact lenses, medical test kits, surgical instruments, cardiac catheters, ventilators, thermometers, condoms, gloves, blood glucose tests, and combination products pose significant health risks.
Musical instruments and accessories	Counterfeits, including guitar strings and straps, are characterized by sophisticated packaging of low-quality knockoffs.
Perfumes and cosmetics	Counterfeit cosmetics have been made with adulterated or unapproved ingredients that are ineffective or even harmful.
Pet food	Counterfeit pet food with unapproved or adulterated content has led to pet deaths.
Pharmaceuticals	Counterfeit pharmaceuticals may contain ineffective or excessive amounts of active pharmaceutical ingredients. They may be contaminated with foreign materials. Some may have active ingredients that are no longer effective due to age, but may have been re-labeled as being current and potent.
Retail store and restaurant names	Stores and restaurants have been established in China with misleading names, such as KFG (for KFC), Buckstar (for Starbucks), and T-Eleven (for 7-Eleven).