Standard Essential Patent in Telecommunication Standard: United States and China Comparison

Hung-yu Chuang

A dissertation
submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy

University of Washington
2016

Reading Committee:
Jane K. Winn, Chair
Toshiko Takenaka
Robert Gomulkiewicz

Program Authorized to Offer Degree:
School of Law

University of Washington

Abstract

Standard Essential Patent in Telecommunication Standard:
United States and China Comparison

Hung-yu Chuang

Chair of the Supervisory Committee:
Professor Jane K. Winn
School of Law

This dissertation takes national standard essential patent ("SEP") policy for telecommunication markets as a case study of global regulatory competition. Nations or regions use technical standard-setting processes as a regulatory tool to promote or protect their local industries. A SEP is one that reads on a specific industry standard so that it is not possible to implement the technical standard without infringing or licensing the patent. Regulatory competition in information and communication technology ("ICT") markets is complicated in part because ICT standards spread worldwide and they may cover hundreds or thousands of SEPs in different countries around the world. Different countries have different intellectual property ("IP") regimes, standardization policies and SEP policies. Private enterprises may try to exploit these differences in an effort in order to dominate global ICT markets. In the past, global multinational corporations ("GMNCs") based in western market economies have dominated global ICT standard-setting organizations ("SSOs") and benefited enormously from SEP revenues earned in global markets, but China is now making progress in challenging this system.

American telecommunication enterprises are strong innovators and so often obtain first-mover advantage in global markets. When they succeed in dominating global ICT standard setting processes, American telecommunication enterprises receive royalties through licensing SEPs around the world. American standardization policy is "market-led" because private enterprises are the leaders and the U.S. government only plays a supporting role.

A major People's Republic of China ("PRC") government policy is to reduce or eliminate SEP royalties paid by Chinese enterprises to foreign enterprises, and to promote PRC indigenous standards as global standards, permitting PRC enterprises to collect SEP royalties from foreign sources. However, Chinese telecommunication enterprises are not as strong in innovation capacity as their American competitors. The PRC government encourages domestic enterprises to engage in Indigenous Innovation and to develop indigenous standards, so technology standard-setting in China is not "market-led." The processes are dominated by the government with the Chinese private sector only playing a supporting role.

Both ICT standards and IP may support the construction of global markets through harmonization. To achieve harmonization, the ICT standardization and IP policies that make up national SEP policies should be similar around the world. But U.S. and China have different national cultures of innovation and legal cultures resulting in different SEP policies. Because U.S. and China are today among the most important national markets for

the global telecommunication industry, it is interesting and important to consider how their competing SEP policies might support or resist the global harmonization trend.

This dissertation uses global 3G international telecommunication standards as a case study to compare U.S. and Chinese regulation of telecommunication technology standardization and national SEP policies. The analysis in this dissertation shows that, although the regulatory competition strategies of the United States and China have evolved over time, they are each largely determined by long-term historical and cultural factors that cannot change quickly. Because national strategies regarding patent law, standardization and SEPs tend to evolve slowly in response to rapidly changing global market conditions, it may be possible to predict the outcome of the coming contest over global 5G telecommunication standards based on the outcomes of contests for control over 2G, 3G and 4G standards.

Table of Contents

List of Tables

List of Figures

Chapter 1 Introduction

I. Background

This dissertation will consider how the legal institutions, economic institutions and government policies of China and the United States have influenced the development of global markets for telecommunication products and services. It will analyze how issues related to patent law, technical standard-setting and the management of standard essential patents ("SEPs") in the area of telecommunications are resolved in the United States and China, and what impact those outcomes have had on global markets. After telecommunications markets were deregulated in the 1980s and 1990s, the pace of innovation in telecommuniations markets around the world accelerated rapidly, and older systems of coordinating the diffisuion of innovation throughout global telecommuciations markets broke down. The result was a technology standards war fought through high-stakes patent litigation with the United States and China serving as major battlefields. The analysis in this dissertation shows that, although the regulatory competition strategies of the United States and China have evolved over time, they are each largely determined by long-term historical and cultural factors that cannot change quickly. Because national strategies regarding patent law, standardization and SEPs tend to evolve slowly in response to rapidly changing global market conditions, it may be possible to predict the outcome of the coming contest over global 5G telecommunication standards based on the outcomes of contests for control over 2G, 3G and 4G standards.

A. Thriving China

A central issue in debates over the future of China's economic miracle of the last thirty years is what changes China needs to make in order to maintain the momentum of its growth as its economy develops.[1] Based on Gross Domestic Product ("GDP"), the People's Republic of China ("PRC" or "China") is now the second largest economy in the world, and plays an important role in the world economy.[2] China's research and development expenditure grows at a rate of nearly 22% per year and reached $136 billion USD, second only to the United States.[3] In patents, China ranked third globally in 2008 and surpassed Japan as second in 2010.[4] No one can deny China's rapid growth and its transformation.[5] In addition, China has the largest population and biggest market in the world despite its socialist economy and state-owned enterprises ("SOEs").[6] The historic and economic

---

[1] *See* RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 21(2011).

[2] *See* Alan Zimmerman & Peggy E. Chaudhry, *Protecting Intellectual Property Rights: The Special Case of China*, 10 J. ASIA-PAC. BUS. 308, 310 (2009).

[3] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 4 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[4] *Id.*

[5] *See* BARRY J. NAUGHTON, THE CHINESE ECONOMY: TRANSITIONS AND GROWTH 3 (2007). For China's economic reform and its background, *see* Loren Brandt & Thomas G. Rawski, *China's Great Economic Transformation, in* CHINA'S GREAT ECONOMIC TRANSFORMATION 1, 4-8 (Loren Brandt & Thomas G. Rawski ed., 2008).

[6] *See* BARRY J. NAUGHTON, THE CHINESE ECONOMY: TRANSITIONS AND GROWTH 3, 8 (2007).

backdrop of China makes it unclear how this rapidly developing country will affect global market governance. This dissertation will discuss China's impact on global market governance from the perspectives of technology standards and their SEPs.[7]

A central issue in debates over the future of the United States' domination of global markets is what the United States needs to do to help its industries stay competitive in global markets and preserve the standard of living of its citizens. The United States competitive advantage in global information and communication technology ("ICT") markets is based on a combination of the large size and integration of its national market; its national culture favoring entrepreneurship, its relatively free-market approach to economic regulation and spillover effects from the world's largest defense budget. In the field of mobile telephony, the United States was the world leader in analog mobile phones during the 1980s, but in the 1990s, Europe's Global System for Mobile Communication ("GSM") system dominated global markets conversion following the conversion from analog to digital phones.[8] This dissertation will focus on the competition between the United States and China for dominance of later generations of mobile telephony. Although Europe has played a major role in global telecommucaitons markets, the focus of this dissertation is only on American and Chinese law and policy for reasons of feasibility.

Most of international trade and intellectual property ("IP") systems have been strongly influenced by advanced market economies, such as the United States. These developed countries maintain global dominance in technological development and consequently dictate current global rules of competition. While developed countries seek to retain its hegemony, China seeks to upset the existing system to gain an economic advantage by means of its large domestic market and cheap labor costs. Today, developed countries and China compete for control over global telecommunication standard-setting processes and resulting SEPs, both of which could help nations and corporations acquire substancial leverage over new produdct developers and collect royalty payments through licensing patented technology.[9]

When technology rapidly develops, technology standards are often covered by SEPs.[10] In the In the telecommunication industry, most of the SEPs are owned by global multinational corporations corporations ("GMNCs") in developed countries. For example, both Motorola and Qualcomm sought sought to gain competitive advantages by having their patented technologies incorporated into into formal standards for modems and cellular telephones.[11] These efforts are reflected in

---

[7] *See also* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 5 (2011), RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 6-7 (2011), Chaoyi Zhao & John M. Graham, *The PRC's Evolving Standards System: Institutions and Strategy*, 2 ASIA POL'Y 63, 65 (2006).

[8] *See also* Jacques Pelkmans, *The GSM standard: explaining a success story*, 8(3) J. EUROPEAN PUB. POL'Y 432 (2001).

[9] *See* Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 1030-1031(9th Cir. Wash. 2015). *See also* Mark A. Lemley & Carl Shapiro, *Patent Hold-up and Royalty Stacking*, 85 TEX. L. REV. 1991, 2010-2013 (2007), Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1160-1162 (2009).

[10] *See* Andrew L. Russell, *Constructing Legitimacy: The W3C's Patent Policy*, *in* OPENING STANDARDS: THE GLOBAL POLITICS OF INTEROPERABILITY 159 (Laura DeNardis ed., 2011).

[11] *See* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 16 (1998).

Figure 1-1, which lays out the distribution of SEP owners for third generation ("3G") telecommunication standards in the 3rd Generation Partnership Project ("3GPP") and 3rd the Generation Partnership Project 2 ("3GPP2").[12] Accordingly, GMNCs often use patents as a key tactic to leveraging their ability to compete in the "standards war," where they use the exclusive rights of SEPs to demand royalty payments.[13]

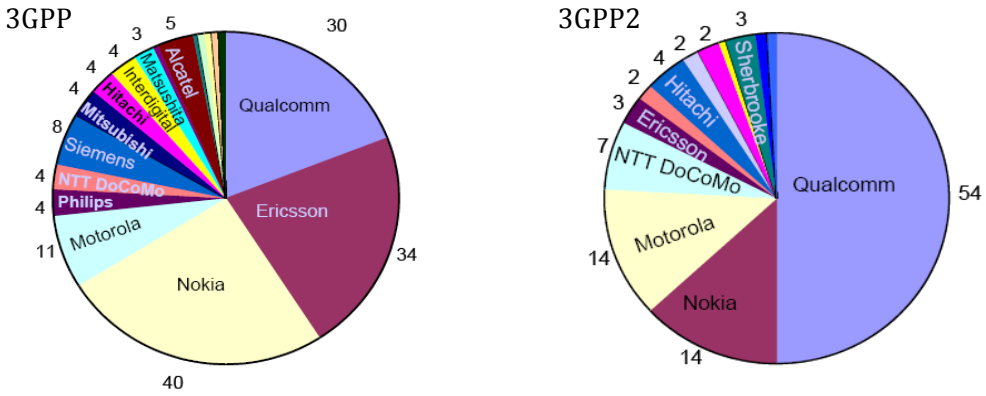


Figure 1-1: IP Judged Essential, 3GPP and 3GPP2 Ownership
Source: David J. Goodman & Robert A. Myers, p.5

Despite the advantages of SEP protections in the West, China was skeptical about the benefits of utilizing the Western IP system.[14] China's history of socialism and Confucianism impacted its initial reluctance to accept the IP system of the West.[15] The Chinese IP system developed in this context and may have unfolded with a residual distrust of the international IP system.[16] China even considered the IP system as merely serving the strategic interests of individual enterprises rather than supporting the public good, such as innovation.[17] However, as China emerged as the most important exporting country, the issue of SEPs in China became increasingly controversial in international trade due to the different positions developed and developing countries took as to what constitutes a fair outcome.[18]

This controversy originated due to the fact that most developed countries first established their domestic technology standards, and then later GMNCs promoted the use of these standards in as many countries as possible. If a technology or product is used or produced uniformly, the production cost can be reduced so that customers can benefit more from the global standardization, which in turn, benefits consumers around the world.

---

[12] David J. Goodman & Robert A. Myers, *3G Cellular Standards and Patents* (2005), *available at* http://eeweb.poly.edu/dgoodman/wirelesscom2005.pdf (last visit date: Sep. 28, 2014).
[13] *See* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 270, 295 (1998).
[14] RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 17 (2011).
[15] *Id.*
[16] *Id*
[17] *Id.*
[18] *See also* Christopher S. Gibson, *Globalization and the Technology Standards Game: Balancing Concerns of Protectionism and Intellectual Property in International Standards*, 22 BERKELEY TECH. L.J. 1403, 1475 (2007), Jane K. Winn, *Globalization and Standards: The Logic of Two-Level Games*, 5 I/S: J. L. & POL'Y FOR THE INFO. SOC'Y 185, 195 (2009).

However, if SEP owners abuse their exclusive rights, these technology standards and SEPs become "technology traps" or "patent traps" instead for developing countries.[19] This is likely the reason why many Chinese enterprises and officials have repeatedly utilized a strategy that views technology standards as trade weapons.[20] This view may originate from their impressions of the Western industry as having used these standards to solidify Western dominance over markets, forcing developing countries to remain in an inferior or disadvantaged position.[21]

One example of how the Western strategy manifested in China can been seen in DVD player manufacturers in China. In the late 1990s, DVDs had an established standard, developed by an alliance of American, European, and Japanese corporations.[22] With a fully developed technology, Chinese corporations had little room to alter the established standard, or to choose alternatives to foreign mandated patents and their associated royalties.[23] Thus by 2002, China's domestic DVD player manufacturers were required to pay the foreign 3C and 6C alliances $26.20 USD in SEP royalties for each DVD player manufactured and exported.[24] A DVD player was sold at around $90 USD at the time, so the SEP royalties accounted for ~20-30% of the entire manufacturing cost.[25] With such high SEP royalty costs, profit margins for Chinese DVD player manufacturers fell to one dollar

---

[19] *See* RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 10-12 (2006), RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM 4, 11, 12(2004).

[20] Scott Kennedy, *The Political Economy of Standards Coalitions: Explaining China's Involvement in High-Tech Standards Wars*, 2 ASIA POL'Y 41, 45 (2006).

[21] *Id.*

[22] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 40 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[23] *Id*.

[24] *See* WU TAIXUAN (吴太轩), JISHU BIAOZHUNHUA DE FANLONGDUANFA GUIZHI (技术标准化的反垄断法规制) [ANTI-MONOPOLY REGULATION ON TECHNOLOGY STANDARDIZATION] 118 (2011), ZHU GUOHUA (朱国华), GAOXIN JISHU CHANYEHUA DE ZHUANLI, BIAOZHUN YU RENCAI ZHANLUE (高新技术产业化的专利,标准与人才战略) [STRATEGY OF PATENT, STANDARD, AND COMPETENT PERSON IN HIGH-TECH INDUSTRIALIZATION] 157 (2010), ZHANG JIHONG(张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 4 (2011), LI YUJIAN (李玉剑), ZHUANLI LIANMENG: ZHANLUE LIANMENG YANJIU DE XINLINGYU (专利联盟: 战略联盟研究的新领域) [PATENT ALLIANCE: NEW AREA OF STRATEGIC ALLIANCE RESEARCH] 1-3 (2006), DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 48 (2011), RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM 11 (2004).

[25] *See Id.*

per unit in 2004.[26] As a result, many of these Chinese enterprises stopped exporting or manufacturing DVD players, some even shut down their operations.[27]

The Chinese DVD player industry was not the only case of Western dominance in the market. The standard-follower and non-tariff barrier issues were common problems many Chinese high-tech enterprises experienced in international trade.[28] Implementing global technology standards patented by foreign enterprises, Chinese enterprises found themselves paying exorbitant royalties and license fees for SEPs, resulting in little to no profit for the enterprise itself. In other words, if a Chinese enterprise entered the market with products based on global technology standards, it could only do so if it was willing to make nearly zero profit and only break even. Concerned about the impact of SEP royalties on China's development, the Chinese government eventually argued that SEPs were a non-tariff barrier in international trade in the *Background Paper for Chinese Submission to WTO on Intellectual Property Right Issues in Standardization*, which was submitted to the World Trade Organization ("WTO") in November 2006.[29]

Today, advanced market economies, particularly the United States, are trying to maintain their lions' share of the digital economy in global markets, while China intends to increase its own share of the digital economy in proportion to its increasingly sophisticated technological capabilities and sustained economic growth.[30] As China's role in the global market grows, tension between the United States and China is inevitable.[31]

B. Indigenous Innovation

China's experience after two decades of reform and engagement with the international economy after the 1980s led its government to understand that its sole reliance on IP-poor

---

[26] *See* DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 40 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[27] *See* WU TAIXUAN (吴太轩), JISHU BIAOZHUNHUA DE FANLONGDUANFA GUIZHI (技术标准化的反垄断法规制) [ANTI-MONOPOLY REGULATION ON TECHNOLOGY STANDARDIZATION] 118 (2011).

[28] *See* Christopher S. Gibson, *Technology Standards – New Technical Barriers to Trade? in* THE STANDARDS EDGE: THE GOLDEN MEAN 45, 46 (Sherrie Bolin ed., 2007), Christopher S. Gibson, *Globalization and the Technology Standards Game: Balancing Concerns of Protectionism and Intellectual Property in International Standards*, 22 BERKELEY TECH. L.J. 1403, 1405 footnote 5 (2007).

[29] Christopher S. Gibson, *Globalization and the Technology Standards Game: Balancing Concerns of Protectionism and Intellectual Property in International Standards*, 22 BERKELEY TECH. L.J. 1403, 1429-1434 (2007), CHINA MINISTRY OF COMMERCE DEP'T OF WTO AFFAIRS, BACKGROUND PAPER FOR CHINESE SUBMISSION TO WTO ON INTELLECTUAL PROPERTY RIGHT ISSUES IN STANDARDIZATION (G/TBT/W/251) (2006), *available at* http://sms.mofcom.gov.cn/article/cbw/200606/20060602564485.shtml (last visit date: Sep. 28, 2014).

[30] Baisheng An, *Intellectual Property Rights in Information and Communications Technology Standardization High-Profile Disputes and Potential for Collaboration Between the United States and China*, 45 TEX. INT'L L.J. 175, 175 (2009), Albert G. Z. Hu & Gary H. Jefferson, *Science and Technology in China*, *in* CHINA'S GREAT ECONOMIC TRANSFORMATION 286, 314 (Loren Brandt & Thomas G. Rawski ed., 2008).

[31] Baisheng An, *Intellectual Property Rights in Information and Communications Technology Standardization High-Profile Disputes and Potential for Collaboration Between the United States and China*, 45 TEX. INT'L L.J. 175, 175 (2009).

"standards taking" put China at a considerable economic disadvantage.[32] The government concluded that control over technology standards and SEPs granted the holders considerable market power.[33] In 2006, the government commenced its fifteen-year *Medium-to Long-Term Plan for Scientific and Technological Development* ("*MLP*"), followed by the introduction of many new implementation policies.[34] These rules became China's "Indigenous Innovation" industrial policies, intended to make China an innovation-oriented society and a world-leading research and development power by 2020.[35]

The Chinese government used standardization as a tool to achieve its Indigenous Innovation goals.[36] One of the primary objectives of the Indigenous Innovation was to develop products that incorporated China-created IP and followed China-developed standards.[37] As shown in Table 1-1, these China-developed standards are based on different technologies in contrast to technology standards developed through the Western standard-setting processes.[38] Through setting these indigenous standards, the Chinese government aimed to help domestic enterprises rid themselves of SEPs and their associated royalty fees.[39] The government did not allow the free market to simply identify the best technology solution.[40] Instead, China generally aimed to completely reverse its position from a standard-taker to a standard-setter.[41]

---

[32] KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 123 (2013).

[33] *Id.*

[34] RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 3 (2011).

[35] RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 11 (2006).

[36] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 19-39 (2011).

[37] RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 12 (2006).

[38] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 36 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), ZHANG PING (张平), CHONGTU YU GONGYING: JISHU BIAOZHUN ZHONG DE SIQUAN BAOHU, XINXI CHANYE JISHU BIAOZHUN DE ZHISHICHANQUAN ZHENGCE FENXI (冲突与共赢:技术标准中的私权保护,信息产业技术标准的知识产权政策分析) [CONFLICT AND MUTUAL BENEFIT: PRIVATE RIGHTS PROTECTION IN STANDARDIZATION, INTELLECTUAL PROPERTY POLICY ANALYSIS OF TECHNOLOGY STANDARD IN INFORMATION INDUSTRY] 392 (2011). *See also* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 267 (1998).

[39] RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 29-31 (2006).

[40] *Id. See also* Pierre Vialle, Junjie Song & Jian Zhang, *Competing with Dominant Global Standards in a Catching-up Context. The Case of Mobile Standards in China,* Telecommunications Policy, 36(10-11) TELECOMM. POL'Y 832, 841 (2012).

[41] Chaoyi Zhao & John M. Graham, *The PRC's Evolving Standards System: Institutions and Strategy*, 2 ASIA POL'Y 63, 78 (2006).

Table 1-1: Unique Chinese Standard Development Efforts (1993-2010)

Technology	Chinese Standard	International Standard
Digital Video Players	VCD 3.0, CVD, EVD, HDV, HVD, CBHD	SVCD, DVD, Blu-Ray, HD-DVD
Mobile Telephony	TD-SCDMA, TD-LTE	WCDMA, CDMA2000, LTE
Wireless Local Area Network Encryption	WAPI	IEEE 802.11i
Audio-Visual Encoding/Decoding	AVS	MPEG2, MPEG4-3 (AAC), MPEG 4-10(H.264), VC-1
Digital Trunking	GoTa, GT800	TETRA, iDEN
Document Formatting	UOF	ODF, OOXML
Home Networking	IGRS, ITopHome	DLNA, UPnP, KNX, ECHONET
Mobile Phone Charger	YD/T 1591-2006	None
Mobile TV	CMMB, T-MMB, CDMB, DMB-T, CMB	DVB-H, T-DMB, MediaFLO
Radio Frequency Identification	NPC	ISO 18000 and others, EPC/GS1, Uid
Security Computer Chip	TCM	TPM
Wireless Metro Area Network	McWill	WiMAX

Source: Dan Breznitz & Michael Murphree, p.36; ZHANG PING, p.392

However, China's Indigenous Innovation policies appeared to threaten the GMNCs' goal of promoting global standards based on technology within the GMNCs' control.[42] Because of this, Western industries and governments began sounding alarms, concerned that China's efforts to shift its position from a standard-taker to a standard-setter challenged an area where the West previously had complete dominance.[43] Consequently, China's Indigenous Innovation policies have been widely criticized by GMNCs and foreign governments as an inefficient and unproductive form of "nationalism."[44] Many GMNCs and foreign governments allege that these China-developed standards violate the WTO's Agreement on Technical

[42] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 2 (2011).

[43] *See* Scott Kennedy, *The Political Economy of Standards Coalitions: Explaining China's Involvement in High-Tech Standards Wars*, 2 ASIA POL'Y 41, 43 (2006). *See also* RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 1 (2006), RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 3 (2011).

[44] *See* DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 2 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM 4, 11, 12 (2004), Scott Kennedy, *The Political Economy of Standards Coalitions: Explaining China's Involvement in High-Tech Standards Wars*, 2 ASIA POL'Y 41, 60 (2006).

Barrier to Trade ("TBT Agreement").[45] In addition, these policies have been criticized as "discriminatory" and used as a trade-distorting ploy to challenge American supremacy in the global knowledge economy.[46] In the *2014 Special 301 Report,* the Office of the United States Trade Representative ("USTR") raised concerns about the troubling Indigenous Innovation policies that may unfairly disadvantage U.S. rights holders in China.[47]

To enforce its Indigenous Innovation policies, the Chinese government attempted to directly regulate the standardization development and SEP problems. That is to say, China currently remains on its course of completing its transition away from bureaucratic socialism and toward a market economy.[48] Some commentators characterize the current Chinese economy as a commanding-heights economy, or as "capitalism with Chinese characteristics."[49] Given this context, when Chinese reformers argue for a transition to a more market-driven standardization system, they are emphasizing that the government should continue to play an important role as a promoter and coordinator of integrated standards and innovation policies.[50] Thus, GMNCs' business strategies in China have struggled to compete in the Chinese market under these PRC policies.

The Chinese government's purpose is not just to protect its domestic industries and enterprises.[51] Another goal for China is to promote the development of some Chinese enterprises that can compete successfully in global markets, which would help China overcome its reliance on foreign technologies and become a leader in setting international technology standards in ICT products. However, just as GMNCs face special challenges when entering the domestic Chinese market because of different market conditions inside China, leading Chinese enterprises also face special challenges when entering global markets because of different conditions in global markets.

C. Regulatory Competition

The United States is the largest economy in the world and China is a close second. Thus, regulatory competition regarding SEP policies between the United States and China plays a central role in determining conditions in global markets.

The standardization systems in these two countries are different. Standardization in the United States is market-led and bottom-up. American industrial standards are generally

---

[45] Scott Kennedy, *The Political Economy of Standards Coalitions: Explaining China's Involvement in High-Tech Standards Wars*, 2 ASIA POL'Y 41, 43 (2006).
[46] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 2-3 (2011), DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 2 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).
[47] U.S. TRADE REPRESENTATIVE, 2014 SPECIAL 301 REPORT 6 (2014), *available at* http://www.ustr.gov/sites/default/files/USTR%202014%20Special%20301%20Report%20to%20Congress%20FINAL.pdf (last visit date: Sep. 28, 2014).
[48] BARRY J. NAUGHTON, THE CHINESE ECONOMY: TRANSITIONS AND GROWTH 4 (2007).
[49] YASHENG HUANG, CAPITALISM WITH CHINESE CHARACTERISTICS: ENTREPRENEURSHIP AND THE STATE 239,276 (2008).
[50] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 2 (2011).
[51] *See* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 5 (1997).

voluntary and non-coercive when they are promulgated by standard-setting organizations ("SSOs").[52] American corporations prefer standards set by the market, so the nature of American standardization is diverse and decentralized.[53] In the United States, enterprises voluntarily join SSOs, and these SSOs play significant roles in establishing technology standards.[54] These American standards and SSOs are often competing with one another.[55] As a whole, the American standardization system is largely shaped by weak government pressure from above, and diffuses pressure from business and insurance needs from below.[56] It is evident that the American standardization system avoids overt responsibility, and minimizes the fear of antitrust, antibusiness, or antilocalism bias.[57]

In contrast, the standardization system in China is government-led and top-down. Owing to its history of state involvement in the economy and the continued normative importance of government sanctions, the economic planning organs of the Chinese government took the lead in establishing standards for its domestic enterprises and industries.[58] Despite more than 30 years of transition to a market economy, standards development is still mostly led by the Chinese central and local government.[59] Chinese government leaders tend to distrust market mechanisms because they are still perceived as favoring foreign GMNC incumbents and making things difficult for Chinese enterprises to operate profitably in global markets or successfully develop technological alternatives.[60]

Patent authority is considered to build blocks of traditional standard systems.[61] It is therefore important to consider SEP issues in both the United States and China.[62] The United States has developed its patent systems since the 17th century, and its patent

---

[52] *Id.* at 100.
[53] Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).
[54] *See* ZHANG JIHONG(张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 56 (2011).
[55] *See* Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).
[56] SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 104 (1997).
[57] *Id*.
[58] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 51 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).
[59] *See Id.*
[60] *See* Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 829 (2012).
[61] *See* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 104 (1997), RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 3 (2006).
[62] *See* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 104 (1997), RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 3 (2006).

systems are well-developed and mature.[63] American federal agencies have established administrative decisions and guidelines that govern anticompetition issues SEPs may cause.[64] American courts also have developed a growing body of case law in its judicial system that address SEP disputes.[65] As a result, the United States has provided well-developed legal systems for SEP owners to ultilize their rights, even if the treatment of SEPs is still being debated and not yet finalized.[66] For the United States, a primary concern in SEP policies is patent protections, and the "openness" of standard-setting subordinated to the patent protections.[67]

China instead does not have such well-developed patent systems. Because of China's traditional culture and socialism experience, a culture of IP protections consistent with Western norms did not take root in China when the current Chinese IP regimes began to emerge in the 1980s.[68] China started its patent systems in 1984, and then revised its *Patent Law* in 1992, 2000, and 2008 respectively.[69] Today, many aspects of China's patent protections are still widely criticized by foreign enterprises and governments.[70] The treatment of SEP raises many complex problems, and the Chinese government is still struggling to deal with basic patent law problems, so it is unclear how the government will be able to deal with issues raised by SEPs.

---

[63] *See* MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 9-19 (3d ed. 2009), ROBERT P. MERGES, PETER S. MENELL & MARK A. LEMLEY, INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE 125-130 (5th ed. 2009).

[64] *See, e.g.,* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION (2007), U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS (2013).

[65] *See, e.g.,* Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015), Qualcomm Inc. v. Broadcom, Corp., 548 F.3d 1004 (Fed. Cir. 2008), Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).

[66] Standard-setting organizations (SSOs) generally have various and ambiguous IP polices regarding the following issues, and courts do not have much evolving case law to solve many of these issues. The issues are concerning (1)disclosure (whose patents must be disclosed; (2)licensing (what specific terms or limitations are imposed by a commitment to FRAND licensing; (3)transfer (concerned that standard implementers could be at risk of hold-up by a new SEP owner); (4)injunctive relief (as a remedy for patent infringement). KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 4-5 (2013).

[67] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 50 (2011).

[68] RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 5 (2011).

[69] ZHANG CHU & XU XINGXIANG, CHINA PATENT LEGAL SYSTEM AND PRACTICE 5, 6, 8, 12.

[70] *See, e.g.,* U.S. CHAMBER OF COMMERCE, CHINA'S WTO IMPLEMENTATION AND OTHER ISSUES OF IMPORTANCE TO AMERICAN BUSINESS IN THE U.S.-CHINA COMMERCIAL RELATIONSHIP (2005) *available at* https://www.uschamber.com/sites/default/files/legacy/reports/050914_wto.pdf 4 (last visit date: Sep. 28, 2014), Alan Zimmerman & Peggy E. Chaudhry, *Protecting Intellectual Property Rights: The Special Case of China*, 10 J. ASIA-PAC. BUS. 308, 308 (2009), U.S. TRADE REPRESENTATIVE, 2014 SPECIAL 301 REPORT (2014), *available at* http://www.ustr.gov/sites/default/files/USTR%202014%20Special%20301%20Report%20to%20Congress%20FINAL.pdf 2 (last visit date: Sep. 28, 2014), NAT'L BUREAU OF ASIAN RESEARCH, THE IP COMMISSION REPORT: THE REPORT OF THE COMMISSION ON THE THEFT OF AMERICAN INTELLECTUAL PROPERTY 1-2 (2013), *available at* http://www.ipcommission.org/report/IP_Commission_Report_052213.pdf (last visit date: Sep. 28, 2014).

D. Dissertation Content

This dissertation will compare standardization systems and SEP treatment in the United States and China. The study will focus on the 3G telecommunication standards in these two countries. The dissertation will discuss how the CDMA 2000 standard was developed by the private sector in the American market, and how the TD-SCDMA standard was formulated and supported by the Chinese government. Through studying the 3G standards in the two nations, the dissertation will then discuss whether the Chinese standardization and SEP policies affect global regulation and competition success.

The first chapter provides an introduction to the dissertation. The introduction includes the background, research questions, contribution and methodology. The second chapter introduces several fundamental concepts regarding regulatory competition, standard-setting, patent protections, SEPs, and telecommunication standards. Chapters Three and Four are concerning standardization regulations in the United States and China respectively. Chapters Five and Six will discuss American and Chinese SEP regulations respectively. In Chapter Seven, the dissertation will analyze the differences between these two countries' standardization and SEP regulations, and then discuss how the two countries' regulations compete with each other. The last chapter offers a conclusion.

II. Research Questions

This dissertation will consider two questions:

- As China's level of economic development rises, will China's SEP policies converge with Western SEP policies? Or will it diverge?
- Will China's SEP policies have any impact on American SEP policies? Why or why not?

The dissertation will discuss these questions from the following three perspectives:

- the different standardization regulations in the United States and China;
- the different SEP regulations in the United States and China; and
- the interaction of these two systems of national regulations and whether they will contribute to global harmonization or fragmentation in the future.

A. Standardization Regulations Comparison

This dissertation will compare the standardization regulations in these two countries. Such a comparison has rarely been seen in other scholarly research. A comparative study of the origins and evolution of the American and Chinese standardization systems is necessary to improve policy debates on whether the two systems are likely to converge or whether they will persistently diverge from one another.[71]

The American government promoted the adoption of private voluntary standards under its laws, such as the *National Technology Transfer and Advancement Act* ("NTTAA").[72]

---

[71] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 107-108 (2011).

[72] *See* Jane K. Winn, *US and EU Regulatory Competition and Authentication Standards in Electronic Commerce 4-5* (2006), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=901324 (last visit date: Sep. 28, 2014), LIU CHUNQING ET AL. (刘春青等), MEIGUO YINGGUO DEGUO RIBEN HE ELUOSI

These deregulation and decentralization policies gave American enterprises market power to lead standardization in global markets. In contrast, China has not changed its *Standardization Law* since the legislation was first enacted in 1989.[73] This law was issued while China was still largely under a planned economy.[74] The *Standardization Law* gives the Chinese government complete authority to establish and administer technology standards.[75] It is questionable whether this legislation can meet China's need today.

In the United States, the private sector assumes leading roles in the standard-setting processes. The private sector's involvement makes the American standardization system more open, voluntary, and consensus-based. However, the situation is different in China. Because industry associations in China must be under the direct control of the central government, they have very intimate and dependent relationships with the government.[76] The growth of such associations does not diminish the dominant role of the state in standard-setting nor does it signal a move towards a more voluntarist approach to standardization.[77] Furthermore, Chinese standards-setting bodies reportedly often deny membership or participation rights to foreign parties, which effectively shut foreigners out of the standard-setting process.[78]

Finally, the case study of the CDMA 2000 and TD-SCDMA standards will be considered. The dissertation will discuss how the CDMA 2000 standard was developed under the American infrastructure, how the private sector developed the standard, and how the American government played a supportive role in standard-setting processes. As contrast, the dissertation will also discuss how the TD-SCDMA standard was established under the Chinese infrastructure, and how the Chinese government supported and intervened in the TD-SCDMA standard-setting processes.

B. Standard Essential Patent Regulations Comparison

The United States has developed its patent systems for over 200 years, while China has only recently copied its patent system froms Western models, particularly the United States' systems.[79] Established only in the 1980s, the young Chinese patent systems is on a steep

---

BIAOZHUNHUA GAILUN (美国, 英国, 德国, 日本和俄罗斯标准化概论) [INTRODUCTION TO STANDARDIZATION IN THE U.S., ENGLAND, GERMAN, JAPAN, AND RUSSIA] 1-11 (2012).

[73] KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 155 (2011).

[74] RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM 24 (2004).

[75] GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 118 (2010).

[76] *See* RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM 27 (2004).

[77] *Id*.

[78] U.S. TRADE REPRESENTATIVE, 2014 SPECIAL 301 REPORT 35 (2014), *available at* http://www.ustr.gov/sites/default/files/USTR%202014%20Special%20301%20Report%20to%20Congress%20FINAL.pdf (last visit date: Sep. 28, 2014).

[79] *See* MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 9-19 (3d ed. 2009), ROBERT P. MERGES, PETER S. MENELL & MARK A. LEMLEY, INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE 125-130 (5th ed. 2009), ZHANG CHU & XU XINGXIANG, CHINA PATENT LEGAL SYSTEM AND PRACTICE 5 (2010).

learning curve.[80] Chinese patent systems cannot be expected to be as mature as the American ones. These two countries also have different innovation cultures and legal traditions. Consequently, it is only logical that these two governments have different SEP regulations when using patent protections as one of their economic regulatory tools.

Three important issues will be addressed regarding SEP regulations in the dissertation:

- Antitrust or competition interventions
- Reasonable royalties awards
- Injunction relief availability

The first issue is regarding the antitrust agency's interventions in SEPs. Because of SEPs' strong exclusive rights, patentees may potentially abuse the monopoly power.[81] Thus, the first issue is whether the government will use competition law as a regulatory tool to stop SEP owners from fully exercising their exclusive rights. The second and third issues concern patent remedies. Fair, reasonable, and non-discriminatory ("'FRAND") is one framework for assessing the reasonableness of royalties.[82] When SEPs are infringed or licensed, courts may use FRAND as a criterion to decide the remedy or license fees. Finally, the section on injunction availability discusses whether the patentee could be granted an injunction when an SEP is infringed, or is limited to seeking money damages.

Today, American antitrust agencies take a hands-off approach regarding antitrust enforcement in IP markets.[83] They regard antitrust and IP as complementary forces instead of forces in contention, and leave it to the marketplace to pick winners and losers in the standard-setting arena.[84] The courts also restrict the interventions of antitrust regulations and leave much room for SEP owners to ultilize their exclusive rights.[85] Patentees have little to be concerened over should they decide to exploit their SEPs in the United States jurisdiction. On the other hand, the Chinese government provides weaker support for private property rights and tends to be more concerned about the monopoly power SEPs cause. The government has struggled to balance its two competing objectives into a single policy on SEPs: limiting the enforcement of patents held by foreign interests in order to protect domestic enterprises from foreign competition, and providing strong patent protections to domestic enterprises that it hopes to position as "national champions" in global markets. However, the recent *Huawei v. InterDigital* illustrates that the Chinese

---

[80] RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 19 (2011). *See also* Albert G. Z. Hu & Gary H. Jefferson, *Science and Technology in China*, *in* CHINA'S GREAT ECONOMIC TRANSFORMATION 286, 292 (Loren Brandt & Thomas G. Rawski ed., 2008).

[81] *See* Apple, Inc. v. Motorola Mobility, Inc., 869 F.Supp.2d 901, 913 (N.D. Ill., 2012), U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 35-36 (2007), Philippe Chappatte, *FRAND Commitments-the Case for Antitrust Intervention*, 5(2) EUR. COMPETITION J. 319, 319 (2009).

[82] Although RAND is the common acronym used in the United States, FRAND is the relevant acronym in Europe. The two acronyms have the equal meanings and application. *See* Doug Lichtman, *Understanding the RAND Commitment*, 47 HOUS. L. REV. 1023, 1025, footnote 6 (2010).

[83] *See also* IAN AYRES & JOHN BRAITHWAITE, RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATIONS DEBATE 7 (1992).

[84] ELEANOR M. FOX, CASES AND MATERIALS ON U.S. ANTITRUST IN GLOBAL CONTEXT 554 (3d ed 2012).

[85] *See* Hynix Semiconductor, Inc. v. Rambus, Inc., 609 F. Supp. 2d 988 (N.D. Cal. 2009), Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008). *But See* Qualcomm Inc. v. Broadcom, Corp., 548 F.3d 1004 (Fed. Cir. 2008), Broadcom Corp. v. Qualcomm, Inc., 501 F.3d 297 (3rd Cir. 2007).

government has a strong tendency to use its *Antimonopoly Law* to limit the SEP owner's exclusive rights.[86]

Regarding SEP remedies, FRAND and injunction issues have been well-discussed in the United States courts in recent years. The *Microsoft v. Motorola* case followed some form of the *Georgia-Pacific* factors and referred to hypothetical negotiations to deal with FRAND disputes.[87] *Apple v. Motorola* rejected the injunctive relief for SEPs in light of the fundamental *eBay* four factors.[88] For China, in an era of globalization, there are huge late-comer disadvantages, and it is hard for late-comer firms to develop strong enough capabilities and unique resources, especially in the case of technology standard development.[89] Most Chinese enterprises are forced to deal with ICT essential patents controlled by foreign enterprises. Because of this, the issue of SEP remedies remains a hotly debated issue in the Chinese legal community. In spite of such progress, SEP protections in China are not as strong as those in the United States.

C. American and Chinese Policies Analysis

After comparing the standardization systems and SEP treatment in the United States and China, the dissertation will discuss how these two nations' competing regulations may support or resist global harmonization.

The American regulations are decentralized and market-led. Many standards and SSOs exist and compete with one another. Thus, during the standardization process, this standard or SSO competition not only causes unnecessary redundancy, but also increases the cost of coordinating with competing standards and SSOs.[90] However, the protections the American government offers on SEPs encourages companies to invest and engage in innovation, while the protections simultaneously cause chaos in the standard-setting process. The results on free-market competition may also afford a good solution to the market and consumers.[91]

In contrast, the Chinese regulations are centralized and government-led. China's current standardization system is composed of a vertical hierarchy of four levels and a horizontal array of complementary institutions.[92] The political conflict among the

---

[86] *See* KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 131 (2013).

[87] *See* Microsoft Corp. v. Motorola, Inc., 2013 WL 2111217 (W.D. Wash. April 25, 2013), Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015).

[88] *See* Apple Inc. v. Motorola, Inc.,110 U.S.P.Q.2D 1695 (Fed. Cir. Apr. 25, 2014), Apple, Inc. v. Motorola Mobility, Inc., 869 F.Supp.2d 901 (N.D. Ill., 2012).

[89] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 829 (2012).

[90] *But see* RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 31 (2006).

[91] *See* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 267 (1998).

[92] Chaoyi Zhao & John M. Graham, *The PRC's Evolving Standards System: Institutions and Strategy*, 2 ASIA POL'Y 63, 64 (2006).

government institutions poses challenges for standardization.[93] In addition, the government leaders are not necessarily experts in the field of technology and tend to be influenced by various political interests, so the finalized decisions may be unprofessional or fails to meet market requirements. Moreover, China's weak SEP protections may inhibit private domestic corporations and foreign enterprises from innovating technology solutions, or may even discourage these entities from working with the PRC government to develop new technology standards.[94] However, as a late-comer in the technological field, China's indigenous standard policy may even protect its domestic industry from competing with foreign enterprises. The state-led regulations aim to increase efficiency and prevent wasting resources in the standard-setting process.

On the surface, the United States and Chinese regulations seem to compete with each other, but these competing positions do not necessarily mean that it is impossible to harmonize these two regimes. Both of these nations' regulations have their advantages and disadvantages, as shown in Table 1-2. Through a case study of 3G telecommunication standards, the dissertation will discuss whether these two national regulations influence global harmonization or fragmentation in the future.

Table 1-2: Two Countries' SEP Policies Analysis

	United States	China
Global regulatory competition advantage	• Market led • Consumer focused • Promotes innovation • Save government resource	• Controlled efficient • Producer focused • Domestic industry protection
Global regulatory competition disadvantage	• Fragmented • Increase coordination cost • Redundancy and waste problems	• Uncertain, government-led • Conflict among government institutions • Suppresses innovation

Source: Compiled by the author

D. Hypotheses

This dissertation hypothesizes that China's political development will determine whether China's SEP policies will converge with or diverge from Western SEP policies. If China continues to reform and open its market, Chinese SEP policies will likely converge with Western systems. However, if China moves toward nationalism instead, Chinese SEP policies will likely diverge from the West. Whether these systems converge or diverge is largely a political question, and not a legal one.

---

[93] *See* KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 126 (2013), RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 31 (2006).

[94] *See* Scott Kennedy, *The Political Economy of Standards Coalitions: Explaining China's Involvement in High-Tech Standards Wars*, 2 ASIA POL'Y 41, 45 (2006).

Secondly, this dissertation hypothesizes that if China's SEP policies converge with the West, it would be a win-win situation for both the United States and China. But, if Chinese SEP policies diverge from the West, it will have little impact on American SEP policies. Ultimately, China's SEP policies will have little impact on American SEP policies regardless of whether Chinese SEP policies converge with or diverge from the West. The United States' two-hundred-year-old systems of standardization and patent are unlikely to change. American systems are based on democracy and the Rule of Law and will not be easily influenced by Chinese SEP policies. However, if China moves toward nationalism and diverges from the established world economic framework, the United States may need to issue a political response to China, such as sanctions in international trade.

III. **Contribution**

"Regulatory competition" is a widely discussed idea in political science and law. Most of the discussion around this subject matter focuses on regulatory competition between states, countries, or regions.[95] There has been little scholarship addressing regulatory competition where China is one of the competitors. However, because China is now a strong country and has great economic influence in the world, it should be the subject of regulatory competition analysis more often in the future. Therefore, this new research and comparison with China will contribute to the political science and legal field.

The second contribution this dissertation offers is in the legal field with regard to regulatory competition research. There has been considerable research on regulatory competition in the areas of tax, labor, corporate governance, and environmental regulations.[96] Even though regulatory competition in standard-setting is slowly gaining greater attention, the discussion on SEPs and IP issues in standard-setting remains a rarely discussed topic. Thus, this dissertation applies a developed theoretical perspective in a new area of law.

Thirdly, the concept of standardization was well developed and broadly discussed in countries such as the United States and the European Union ("EU").[97] Thus, the current knowledge regarding standardization is mostly from the West, and there is little analysis of standardization systems in non-Western countries, particularly China. In addition, the IP systems in the United States and China differ significantly while both are supposed to conform to TRIPS. Under these circumstances, a comparison of standardization and patent systems in the United States and China may provide new insights into each system. Based on this case study, the dissertation might also provide a framework for analyzing which standardization and patent systems could work well or poorly in other Asian or developing countries.

---

[95] *See, e.g.,* DALE D. MURPHY, THE STRUCTURE OF REGULATORY COMPETITION: CORPORATIONS AND PUBLIC POLICIES IN A GLOBAL ECONOMY (2004), Jane K. Winn, *US and EU Regulatory Competition and Authentication Standards in Electronic Commerce* (2006), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=901324 (last visit date: Sep. 28, 2014).

[96] *See* ROBERT BALDWIN, MARTIN CAVE & MARTIN LODGE, UNDERSTANDING REGULATION: THEORY, STRATEGY, AND PRACTICE 368 (2d ed. 2012), Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51 (2002).

[97] *See* BJÖRN LUNDQVIST, STANDARDIZATION UNDER EU COMPETITION RULES AND US ANTITRUST LAWS - THE RISE AND LIMITS OF SELF-REGULATION (2014).

Finally, IP systems harmonization is an important issue in the world despite the difficulties of harmonizing IP laws across developed and developing countries. Today, China's orientation toward the international IP systems is frequently criticized as having an underlying ambivalence.[98] Through an analysis of SEP problems in the United States and China, the dissertation will discuss the possibility of harmonizing patent systems in developed and developing countries.

IV. Methodology

A. Methodology Chosen

This dissertation uses judicial decisions, administrative guidelines or decisions, and legislation as its primary materials. It also uses secondary sources to compare the regulations in the United States and China. The secondary sources are predominantly peer-reviewed journal articles, law review articles, treatises, industry survey reports, and other relevant research.

A portion of this dissertation will also include interviews conducted with United States and Chinese experts on the subject. These experts are comprised of individuals representing enterprises, governments, universities, research institutes, or industry associations. The purpose of these interviews is to collect background information behind the regulations, to understand future development of these countries' regulations, and to understand the future situation of international regulatory competition.

B. Countries Chosen

This dissertation has chosen the United States and China in order to compare their standardization and SEP regulations. The first reason for this choice is that these two countries are the two of the largest economies in the world. Previous literature has mainly focused on standards originating in the West.[99] However, China's case has unique and specific characteristics that warrant a focused scholarly investigation.[100]

- First, China has clear objectives for catching-up in many ICT fields and for reducing IP by developing domestic Indigenous Innovation capabilities.[101]

---

[98] RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA 19 (2011).

[99] Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 401 (2011).

[100] Pierre Vialle, Junjie Song & Jian Zhang, *Competing with Dominant Global Standards in a Catching-up Context. The Case of Mobile Standards in China,* Telecommunications Policy, 36(10-11) TELECOMM. POL'Y 832, 833 (2012), Jun Xia, *China's Telecommunications Industry in the Era of 3G and beyond: Market, Technology, and Institutions*, 36 TELECOMM. POL'Y 793, 793 (2012). *See also* KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 2, 11,12 (2013).

[101] Pierre Vialle, Junjie Song & Jian Zhang, *Competing with Dominant Global Standards in a Catching-up Context. The Case of Mobile Standards in China,* Telecommunications Policy, 36(10-11) TELECOMM. POL'Y 832, 833 (2012).

- Second, China has the largest telephone subscriber base in the world, and the market size allows implementing policies which may be illusory in other markets.[102]
- Third, China has a unique institutional standard-setting process compared to the West.[103]
- Finally, the Chinese telecommunication operators are controlled by the state and can be therefore powerful instruments for the government.[104]

Moreover, the United States is a leading advanced market economy, and China is representative of a developing country and socialist society. These two countries have clearly different characteristics. Thus, a thorough comparison of these countries' respective standardization and SEP regulations will offer valuable insight into potential global trends. Although developments in the European Union and in other countries, such as Japan and Korea, may be relevant to developments in global markets, for feasibility reasons, this dissertation will only consider developments in the United States and China.

C. Industry Chosen

The telecommunication industry and its standards have extensive patents or SEPs. Thousands of patents have been identified as essential to 3G telecommunication standards.[105] Also, once telecommunication standards are adopted, they can be used for a long time and the costs of switching to alternative standards are pretty high.[106] Accordingly, the patent hold-up problem is particularly severe in telecommunication standards.[107] These are the primary reasons the telecommunication industry has been selected for this dissertation.

Many technology standards enable products or technologies designed and manufactured by different enterprises to operate and communicate with one another.[108] Such "interoperability" standards can bring beneficial network effects and efficiencies when implemented broadly across markets.[109] Despite their significance in many industries, the interoperability standards are particularly characterized in the telecommunication

---

[102] *Id.*, Jun Xia, *China's Telecommunications Industry in the Era of 3G and beyond: Market, Technology, and Institutions*, 36 TELECOMM. POL'Y 793, 793 (2012).
[103] Jun Xia, *China's Telecommunications Industry in the Era of 3G and beyond: Market, Technology, and Institutions*, 36 TELECOMM. POL'Y 793, 793 (2012). *See also* KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 2, 11,12 (2013).
[104] Pierre Vialle, Junjie Song & Jian Zhang, *Competing with Dominant Global Standards in a Catching-up Context. The Case of Mobile Standards in China,* Telecommunications Policy, 36(10-11) TELECOMM. POL'Y 832, 833 (2012).
[105] Mark A. Lemley & Carl Shapiro, *Patent Hold-up and Royalty Stacking*, 85 TEX. L. REV. 1991, 1992 (2007).
[106] Philippe Chappatte, *FRAND Commitments-the Case for Antitrust Intervention*, 5(2) EUR. COMPETITION J. 319, 326 (2009).
[107] *Id.*
[108] CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 13, 174 (1998).
[109] *Id.*

technology, information technology, and consumer electronics sectors.[110] As a result, understanding standardization problems in the telecommunication industry can also help us understand the same problems in other industries.

D. Standard Chosen

In the 2000s, the Chinese government initiated its international standardization of indigenous technologies.[111] China currently has at least 12 government-led technology standards in ICT industries, which compete with global technology standards.[112] Among these indigenous standards, the Chinese government places greater emphasis on and investment into its TD-SCDMA standard.[113] Therefore, this dissertation will focus on 3G telecommunication standards, including the China-based TD-SCDMA standard and the United States-based CDMA 2000 standard.

Telecommunication standards continue to evolve and compete in modern society. In 2000, the TD-SCDMA standard won global recognition by the International Telecommunication Union ("ITU") as one of the three 3G telecommunication standards.[114] Then in early 2012, an upgraded version of TD-SCDMA, Time Division Long Term Evolution ("TD-LTE"), was also adopted as one of the two global 4G telecommunication standards.[115] In discussing the 3G standards which have developed over the last 15 years, this research could be used to predict future developments in the telecommunication industry.

---

[110] *See* KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 16 (2013).

[111] Jooyoung Kwak, Heejin Lee & Do Bum Chung, *The Evolution of Alliance Structure in China's Mobile Telecommunication Industry and Implications for International Standardization*, 36(10-11) TELECOMM. POL'Y 966, 967 (2012).

[112] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 36 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), ZHANG PING (张平), CHONGTU YU GONGYING: JISHU BIAOZHUN ZHONG DE SIQUAN BAOHU, XINXI CHANYE JISHU BIAOZHUN DE ZHISHICHANQUAN ZHENGCE FENXI (冲突与共赢:技术标准中的私权保护,信息产业技术标准的知识产权政策分析) [CONFLICT AND MUTUAL BENEFIT: PRIVATE RIGHTS PROTECTION IN STANDARDIZATION, INTELLECTUAL PROPERTY POLICY ANALYSIS OF TECHNOLOGY STANDARD IN INFORMATION INDUSTRY] 392 (2011).

[113] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 76-77 (2011).

[114] Jooyoung Kwak, Heejin Lee & Do Bum Chung, *The Evolution of Alliance Structure in China's Mobile Telecommunication Industry and Implications for International Standardization*, 36(10-11) TELECOMM. POL'Y 966, 967 (2012).

[115] *Id.*

Chapter 2 Fundamental Concepts

I. Regulatory Competition

A. Regulation

Regulation is a concept that has existed since the beginning of human society.[116] Regulation is a broad concept, but this dissertation will focus specifically on modern economics regulation.

Administrative law (including regulations) are the primary vehicle through which governments implement policy goals.[117] Regulations are typically specific prescriptions by authorities for the control or management of agencies, organizations, systems, or industries.[118] They can be simply regarded as directions from competent authorities.[119] They are specific instructions concerning what individuals and organizations can or cannot do.[120] They may take the form of various governmental policies, which broadly include laws, administrative guidelines, bureaucratic regulations, codes, or standards.[121]

Regulations can generally be classified into "economic" regulations and "social" regulations.[122] Economic regulations cover a much narrower range of activities than social regulations.[123] Economic regulations intervene directly in market decisions, such as market competition, product or service pricing, market entry or exit.[124] In contrast, social regulations protect public interests, such as environmental protection, consumer protection, public health and safety, and social cohesion.[125]

To monitor and enforce the issues mentioned above in social regulations, policymakers choose from a range of regulatory instruments, shown in the following Figure 2-1.[126] These regulatory instruments may be classified according to the degrees of government intervention required.[127]

---

[116] *See* ARIE FREIBERG, THE TOOLS OF REGULATION 1 (2010).
[117] SUSAN E. DUDLEY & JERRY BRITO, REGULATION: A PRIMER 1 (2d ed. 2012).
[118] BRYAN A. GARNER, GARNER'S DICTIONARY OF LEGAL USAGE 790 (3d ed 2011). *See also* BRYAN A. GARNER, BLACK'S LAW DICTIONARY 1475 (10th ed. 2014), ARIE FREIBERG, THE TOOLS OF REGULATION xxxii (2010).
[119] DALE D. MURPHY, THE STRUCTURE OF REGULATORY COMPETITION: CORPORATIONS AND PUBLIC POLICIES IN A GLOBAL ECONOMY 5 (2004).
[120] SUSAN E. DUDLEY & JERRY BRITO, REGULATION: A PRIMER 1 (2d ed. 2012).
[121] DALE D. MURPHY, THE STRUCTURE OF REGULATORY COMPETITION: CORPORATIONS AND PUBLIC POLICIES IN A GLOBAL ECONOMY 5 (2004).
[122] *See* ANTHONY I. OGUS, REGULATION: LEGAL FORM AND ECONOMIC THEORY 4 (2004).
[123] *Id.* at 5.
[124] ORG. FOR ECON. COOP. & DEV., THE OECD REPORT ON REGULATORY REFORM: SYNTHESIS 6 (1997), *available at* http://www.oecd.org/regreform/regulatory-policy/2391768.pdf (last visit date: May 29, 2016). *See also* ANTHONY I. OGUS, REGULATION: LEGAL FORM AND ECONOMIC THEORY 5 (2004).
[125] ORG. FOR ECON. COOP. & DEV., THE OECD REPORT ON REGULATORY REFORM: SYNTHESIS 6 (1997), *available at* http://www.oecd.org/regreform/regulatory-policy/2391768.pdf (last visit date: May 29, 2016). *See also* ANTHONY I. OGUS, REGULATION: LEGAL FORM AND ECONOMIC THEORY 4 (2004).
[126] *Id.* at 5.
[127] *Id*.

- "Information" measures have the lowest degree of government intervention among all the social regulations.[128] The regulatory measures merely require suppliers to disclose certain facts, but do not otherwise impose behavioral controls.[129]
- At the other end of the spectrum is "prior approval," which has the strongest degree of government intervention.[130] Without obtaining prior approval from authorizing agencies, individuals or organizations may be prevented from lawfully supplying products or services.[131]
- "Standards" are located in the middle between information measures and prior approval.[132] The regulatory techniques of standards allow activities to take place without any *ex ante* governmental control.[133] However, failure to meet these regulatory standards will result in an offense.[134]

Figure 2-1: Intervention of Social Regulations

Degrees of Intervention				
← Low				High →
Information	Standards			Prior Approval
	Target	Performance	Specification	

Source: Anthony I. Ogus, p.151

Ogus suggests that regulatory standards can be subdivided into three different categories (target, performance, and specification), and each of the categories represents various degrees of government intervention.[135]

- "Target standards" are the least interventionist standard technique.[136] The technique prescribes no specific standard in either process or output, but it imposes criminal liability for certain harmful consequences caused by the output.[137]
- "Performance standards" (otherwise known as "output standards") require certain conditions of quality to be met at the point of output, but they apply a hands-off approach to the processes on how to meet these requirements.[138]
- "Specification standards" (otherwise called "input standards") are the most interventionist and restrictive.[139] These standard techniques can exist in both a positive or negative form: the former compels the use of certain manufacture methods or materials; the latter prohibits the use of certain methods or materials.[140]

---

[128] *Id.* at 5, 150-151.
[129] *Id.* at 150.
[130] *Id.* at 5, 150-151.
[131] *Id.* at 150.
[132] *Id.* at 5.
[133] *Id.* at 150.
[134] *Id*.
[135] *Id.* at 150-151.
[136] *Id.* at 151.
[137] *Id*.
[138] *Id*.
[139] *Id*.
[140] *Id*. Technological complexities of inputs are often the primary reason to lay down a series of specification standards to achieve outcomes. Specification standards cause the inputs to vary little from one firm to another, which can help standard-setters predict compliance costs. The primary

B. Regulatory Competition

Regulatory competition means the competitive adjustment of regulatory regimes in order to secure some advantages and benefits.[141] Regulators (e.g. national governments, local governments) could be considered as potential competitors in offering a product, namely a regulatory regime which creates an environment for doing business.[142] Individuals or organizations (particularly corporations) choose the jurisdiction that best reflects their preference for the legal environment of business, and if their preference is strong enough, they may consequently move to their favorite jurisdictions.[143] These organizations or individuals can be called "consumer-voters," and they have the ability to "vote with their feet."[144] To have the "vote-with-feet" effect, consumer-voters should have the following as prerequisites: [145]

(1) they are fully mobile;
(2) they are fully aware of the different "bundles" on offers;
(3) they have a large number of communities to choose from;
(4) no restrictions on employment exist; and
(5) no externalities exist.

Regulatory competition may trigger a "race to the bottom" based on lax standards or a "race to the top" based on stringent standards.[146] Race to the bottom means regulators find themselves in a "prisoner-dilemma" style contest.[147] The contest drives the regulators to adopt ever-decreasing standards or other regulations beneficiary to regulatees in order to attract more consumer-voters.[148] Conversely, race to the top means regulators move toward higher standards or other regulations unfavorable to regulatory subjects that they would not have adopted were it not for the presence of rival regulators.[149]

C. United States Legal Institutions

The United States Constitution established three branches of government: executive, judicial, and legislative.[150] The U.S. legal system is a federal system with a central federal

---

advantage of standards is to save on administrative costs. On the other hand, prohibition of other inputs would inhibit corporations from not only innovating in general, but also from developing other cost-efficient ways of meeting regulatory targets in particular. These restrictions may give rise to technological rigidity. Moreover, specification standards tend to become obsolete very rapidly, and there are typically delays before technological changes are reflected in new standards. These gaps may possibly lead to major social welfare losses. *Id.* at 167-168.

[141] ROBERT BALDWIN, MARTIN CAVE & MARTIN LODGE, UNDERSTANDING REGULATION: THEORY, STRATEGY, AND PRACTICE 356 (2d ed. 2012).

[142] *Id.*

[143] *Id.* at 357-358.

[144] *Id.*

[145] *Id.* at 358, Charles M. Tiebout, *A Pure Theory of Local Expenditures*, 64(5) J. POL. ECON. 416, 419 (1956).

[146] ROBERT BALDWIN, MARTIN CAVE & MARTIN LODGE, UNDERSTANDING REGULATION: THEORY, STRATEGY, AND PRACTICE 362 (2d ed. 2012).

[147] *Id.*

[148] *Id.*

[149] *Id.*

[150] *See* U.S. CONST. art. I, II, III. *See also* CHRISTOPHER N. MAY & ALLAN IDES, CONSTITUTIONAL LAW: NATIONAL POWER AND FEDERALISM 313 (6th ed. 2012).

government and fifty state governments.[151] In the 20th century, independent regulatory agencies also played a major role in the government.[152] The focus of this dissertation is on legislation from Congress, agency regulations, judicial decisions, and executive enforcement of intellectual property ("IP") laws and antitrust laws.

The United States have developed for over two hundred years to establishe its structure of government for the venerable republic.[153] Under the structure, a roomful of people in Congress could elect a President who represents over 300 million people of the United States.[154] A federal government formed in 1789 could enforce enumerated administrative authorities.[155] Nine unelected Justices of the Supreme Court could review and mediate the legislative and administrative power.[156] These three (legislative, administrative, judicial) powers are distinct and separate, and this governmental structure is a very odd mix indeed.[157] However, a government of checks and balances on these three powers as central themes has somehow survived, and may have even served the nation well.[158] In the American legal history, one branch of the government has often been able to curb the excess of another.[159] Even the Supreme Court has been checked by other branches of government.[160]

D. Chinese Legal Institutions

The structure of the Chinese government also consists of legislative, administrative and judicial institutions, which appear quite similar with the Western model.[161] However, the norms and practices of these Chinese institutions often depart significantly from the expectations of those familiar with the liberal legal systems that originated from the Western world.[162] These departures and differences reflect the influence of Chinese local legal culture, which acts as a normative filter and through which flow the influences of international and foreign legal models.[163] The instrumentalism and formalism of official legal culture, as well as the relational and autonomous features of popular legal culture, impact the performance of Chinese legal institutions.[164] China's governmental structure shows the process of selective adaptation in China, which influences the introduction of international norms on legal institutions.[165] The development of China's legal institutions to a large extent has reflected the dynamics of Chinese local legal culture, and particularly the imperatives of political control for the Chinese Communist Party.[166]

---

[151] *See* U.S. CONST. art. IV, amend. X. *See also* CHRISTOPHER N. MAY & ALLAN IDES, CONSTITUTIONAL LAW: NATIONAL POWER AND FEDERALISM 280 (6th ed. 2012).
[152] *See* Paperwork Reduction Act, 44 U.S.C. § 3502(5) (2006). *See also* WILLIAM F. FUNK & RICHARD H. SEAMON, ADMINISTRATIVE LAW 7 (5th ed. 2015).
[153] *See* LLOYD BONFIELD, AMERICAN LAW AND THE AMERICAN LEGAL SYSTEM IN A NUTSHELL 50 (2006).
[154] *See Id.*
[155] *See Id.*
[156] *Id.*
[157] *Id.*
[158] *Id.*
[159] *Id.*
[160] *Id.*
[161] PITMAN B. POTTER, THE CHINESE LEGAL SYSTEM: GLOBALIZATION AND LOCAL LEGAL CULTURE 37 (2001).
[162] *Id.*
[163] *Id.*
[164] *Id.*
[165] *Id.*
[166] *Id.*

II. Standard Setting

A. Technology Standards

Technology standards are detailed sets of specifications and instructions used to achieve a particular technological purpose.[167] The purpose entails a minimum level of safety, a desired environmental effect, and interoperability among different products and technologies.[168] The last category is achieved by so-called "compatibility (interoperability) standards," defining interfaces between discrete objects.[169] These compatibility standards not only bring efficiencies and economics of scale in the manufacturing process, but also promote interoperability between complementary products.[170] They are pretty prevalent in the information and communication technology (ICT) industry.[171] In addition, compliance with the compatibility standards is generally voluntary and not dictated by any governmental or regulatory body (different from compliance with safety or environmental protection standards).[172] Market participants can choose to adopt some compatibility standards to make their products and technologies competitive in a networked, interdependent marketplace.[173]

The compatibility/interoperability standards have both advantages and disadvantages. Because of the increasing importance interoperability with the growing use of computers and information technology, the compatibility standards first facilitate the adoption and advancement of technologies, as well as promote the development of products.[174] Standards can lead to early adoption of new technologies and products.[175] Moreover, they can lower manufacturing costs because of economics of scale.[176] They can also increase price competition by means of eliminating "switching costs" for consumers who plan to switch from products or technologies of one firm to those of another.[177] However, the compatibility standards may potentially have an anticompetitive impact because they reduce competition to provide consumers with more options.[178]

---

[167] Jorge L. Contreras, *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, 53 JURIMETRICS J. 163, 164 (2013). *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 52, 65 (1997).
[168] *Id.* at 164-165.
[169] *Id.* at 165, ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 18 (2014).
[170] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 18 (2014).
[171] Jorge L. Contreras, *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, 53 JURIMETRICS J. 163, 165 (2013).
[172] *Id.*
[173] *Id. See also* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 245-248 (1998).
[174] Research in Motion Ltd. v. Motorola, Inc., 644 F. Supp. 2d 788, 790 (N.D. Tex. 2008). *See also* MURPHY, CRAIG N. & YATES, JOANNE , THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO): GLOBAL GOVERNANCE THROUGH VOLUNTARY CONSENSUS 1 (1st 2009).
[175] Research in Motion Ltd. v. Motorola, Inc., 644 F. Supp. 2d 788, 790 (N.D. Tex. 2008).
[176] *Id.*
[177] *Id.*
[178] Jonas Hein, *The Recent DOJ and FTC Policy Suggestions for Standard Setting Organizations- The Way out of Standard-essential Patent Hold-up?* 2(2) J. INTELL. PROP. & ENT. L. 339, 343 (2013). *See also* Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY

B. **Standard Setting**

Technology standard-setting can take various organizational forms.[179] These organizational forms will depend on what type the standard is- "*de facto,*" "*de jure,*" or "voluntary consensus" as shown in the following Table 2-1.[180]

- *De facto* standards arise from market operation, as consumers gravitate towards a single product or technology and reject other competing alternatives.[181] The development of the *de facto* standards may be characterized by strong network effects in the market, because of the large benefits associated with adopting an identical product or technology.[182]
- Governments can identify and establish *de jure* standards, and can compel all participants in the market to comply with the mandatory standards.[183]
- As for setting voluntary consensus standards, one of the approaches is through opening private industry institutions to all companies to develop and adopt these standards.[184] Private institutions include professional and technical organizations (e.g. the Institute of Electrical and Electronics Engineers ("IEEE")), a host of less formalized consortia (e.g. the Worldwide Web Consortium ("W3C")).[185] In addition to private institutions, international treaty organizations (e.g. International Telecommunications Union ("ITU")), regional standardization organizations (e.g. the European Telecommunications Standards Institute ("ETSI")), and national standardization bodies (e.g. British Standard Institute ("BSI")) can also develop voluntary consensus standards.[186]

REV. 51, 52&table 1 (2002), SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 15 (1997), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 7 (1997), ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 8-9 (1990).

[179] Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L.REV. 1889, 1898 (2002).

[180] *Id.* at 1898-1899, ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 18-19 (2014), U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 5-6 (1992).

[181] Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L.REV. 1889, 1899 (2002).

[182] *Id.*

[183] *Id.*

[184] *Id.* at 1898, MURPHY, CRAIG N. & YATES, JOANNE , THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO): GLOBAL GOVERNANCE THROUGH VOLUNTARY CONSENSUS 6, 9 (1st 2009). The term of "consensus" refers to the collaborative process used to develop the voluntary consensus standards; the term of "voluntary" indicates that nobody is legally compelled to use the standards. ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 19 (2014).

[185] Jorge L. Contreras, *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, 53 JURIMETRICS J. 164, 165 (2013).

[186] *See Id.,* Jorge L. Contreras, *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, 53 JURIMETRICS J. 164, 165 (2013), DAVID TELYAS, THE INTERFACE BETWEEN COMPETITION LAW, PATENTS AND TECHNICAL STANDARDS 37, 40 (2014).

Table 2-1: Organizational Form of Different Standards

Standard	Organizational Form
De facto standard	Arising from common usage or market acceptance
De jure standard	Mandated by regulators at the local, state, federal, or international level
Voluntary consensus standard	Negotiated through a voluntary consensus process and specified within a range of private institutions, including engineering societies, trade associations, accredited standard-setting organizations, and industry consortia

Source: Andrew L. Russell, p.18-19

Therefore, technology standards can develop through various origins and forms: (*de facto* standards) originating from the market, (*de jure* standards) mandated by the government, (voluntary consensus standards) developed by various standard-setting organizations ("SSOs").[187] The last one—developing by SSOs— is the most complicated and least understood.[188] Table 2-2 offers a summary of the SSOs including private institutions and official organizations referred to above.[189]

Table 2-2: Categorization of SSOs and Standards

	SSOs		**Market**
	Standard Development Organizations ("SDOs"), including:	Non-accredited SSOs, including:	
Origin	• Regional (European) standardization organizations • National standardization bodies • International accredited standardization organization • International treaty organizations	• Industry organizations • Consortia • Fora	
Type	Accredited standards	Non-accredited standards	
	Formal standards		*De facto* standards

Source: DAVID TELYAS, p.400 (primary); Jorge L. Contreras, p.165

III. **Patent Protection**

[187] *See* ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 18-19 (2014). *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 32-36 (1997).
[188] *See* ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 19 (2014). *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 118-124 (1997).
[189] DAVID TELYAS, THE INTERFACE BETWEEN COMPETITION LAW, PATENTS AND TECHNICAL STANDARDS 40 (2014), Jorge L. Contreras, *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, 53 JURIMETRICS J. 164, 165 (2013).

A. Patent

A patent is a grant from a government, which confers an inventor an exclusive right to exploit the invention for a fixed period of time.[190] The inventor then can exclude others from making, using, selling, importing, or offering the invention for sale.[191] The right to exclude generally implies injunctive relief.[192] For a patentee, injunctive relief is the most attractive remedy in most instances, because it excludes infringers from making, using, and selling the patented invention.[193] On the other hand, damages can be regarded as an indication of the invention's value.[194] However, beyond compensating a patentee for infringement, theories of damages also significantly impact substantive patent law.[195] The availability and amount of damages to some extent inform the claiming techniques of a patent applicant, and even inform the administrative practices of the IP Office.[196]

B. International Harmonization

With increasing international trade and globalization, there is a growing recognition that technology has no borders.[197] However, nations around the world have yet to agree on a global patent system.[198] Patent prosecution and litigation consequently emerged in a piecemeal fashion on a jurisdiction-by-jurisdiction basis.[199] Corporations and enterprises thus desire to facilitate multinational patent acquisitions and to harmonize national patent laws.[200] This desire has led to several international agreements concerning patents.[201]

Of these agreements, the Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS") is one of the most important commercial treaties in modern history.[202] The TRIPS Agreement is the first treaty that extensively required signatory nations to maintain specified standards of substantive patent law. [203] It specifies that member states must observe certain requirements pertaining to patent-eligible subject matter and standards of patentability (such as novelty and non-obviousness).[204] The TRIPS Agreement harmonized IP treatment in each signatory nation, and forced some signatories to make significant

---

[190] DAVID PRESSMAN, PATENT IT YOURSELF: YOUR STEP-BY-STEP GUIDE TO FILING AT THE U.S. PATENT OFFICE 9 (15th ed. 2011).
[191] *Id.*
[192] MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 834 (3d ed. 2009).
[193] *Id.*
[194] *Id.*
[195] *Id.*
[196] *Id*.
[197] ROGER E. SCHECHTER & JOHN R. THOMAS, PRINCIPLES OF PATENT LAW 18 (2004).
[198] *Id*.
[199] *Id*. at 18-19.
[200] *Id*. at 19.
[201] *Id*.
[202] MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 18 (3d ed. 2009).
[203] ROGER E. SCHECHTER & JOHN R. THOMAS, PRINCIPLES OF PATENT LAW 20 (2004).
[204] *Id*.

changes to their patent laws.[205] For instance, it required India to adopt a modern strong system of patent protection that includes protection for pharmaceutical compounds.[206]

IV. Standard Essential Patent

Some technology standards may incorporate patented technologies.[207] Where implementing technology standards requires the use of the patented technologies, these patents are so-called "standard essential patents ('SEPs')."[208] Once patents become SEPs, companies that manufacture products governed by the standards become "locked in" to the patented technologies incorporated into the standards.[209] Given this situation, prospective licensees have no other alternative to the patented technologies.[210] Customers have no practical choice other than to buy the products complying with these standards.[211] The patents (SEPs) gain undue significance and market power as a result.[212]

It is inevitable that patented technologies will be incorporated into ICT technical specifications.[213] There are also increasing cases in which the ICT industry has created some design requirements that cannot be (easily) achieved without including patented technologies.[214] To some extent, incorporating patents into technology standards can improve cost effectiveness, increase technology performance, or match with other design requirements.[215] However, tensions may exist between owners and users of the patented technologies.[216] Owners generally seek significant economic returns on their innovation investments, while users want access to the patented invention on affordable or reasonable terms.[217] Standards often promote widespread acceptance and utilization of a technology in order to achieve network effect.[218] Therefore, the tensions between the technology owners and users are even more pronounced in the realm of standards.[219]

---

[205] *See* MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 18 (3d ed. 2009).
[206] *Id*.
[207] Apple, Inc. v. Motorola Mobility, Inc., 886 F. Supp. 2d 1061, 1067 (W.D. Wis. 2012).
[208] Steven M. Amundson, *Recent Decisions Provide Some Clarity on How Courts and Government Agencies Will Likely Resolve Issues Involvings Standard-Essential Patents*, 13 CHI.-KENT J. INTELL. PROP. 91, 92 (2013).
[209] Research in Motion Ltd. v. Motorola, Inc., 644 F. Supp. 2d 788, 790-791 (N.D. Tex. 2008).
[210] Apple, Inc. v. Motorola Mobility, Inc., 869 F.Supp.2d 901, 913 (N.D. Ill., 2012).
[211] Research in Motion Ltd. v. Motorola, Inc., 644 F. Supp. 2d 788, 791 (N.D. Tex. 2008).
[212] *Id.*, Apple, Inc. v. Motorola Mobility, Inc., 869 F.Supp.2d 901, 913 (N.D. Ill., 2012).
[213] KEITH MASKUS, STEPHEN A. MERRILL, COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY 16 (2013).
[214] *Id.*
[215] *Id.*
[216] *Id.* at 1, 16.
[217] *Id.*
[218] *Id.*
[219] *Id.*

An SEP owner generally has the ability to block others from producing any products compliant with the technology standard.[220] The owner can also demand royalties significantly higher than the royalties it could have demanded had the patented technology not been incorporated into the standard, or before the standard was adopted and competition eliminated.[221] These are known as the "holdup problem."[222] Given the holdup problem, consumers are deprived of the benefits of competition among technologies and products, and may pay higher prices as a result.[223] The SEP owner ultimately captures value (also called the "holdup value") unrelated to its invention.[224] However, the holdup problem will lead to the surge of the SEP owner's bargaining power and market power.[225] Under these circumstances, holdup and its threat may ultimately discourage innovation by increasing costs and uncertainty for manufacturers.[226] The holdup problem may be diminished in situations where there are patent cross-licenses, and where the major value of standard does not come from SEPs royalties but from selling products that implement the standards.[227]

In addition to the holdup problem, "holdout" issue might occur in the standard-setting process.[228] The holdout issue takes place when incorporating patents into technology standards brings patentees fairly serious restrictions, such as unavailability of injunction or concerns of antitrust.[229] In order to avoid these restrictions, patentees strategically refuse to join standard-setting process, or to incorporate their patents into technology standards.[230]

---

[220] Philippe Chappatte, *FRAND Commitments-the Case for Antitrust Intervention*, 5(2) EUR. COMPETITION J. 319, 326 (2009).
[221] *Id*.
[222] *Id.* "Patent holdup" can also be defined as: "(1) when a component patent owner (2) is able to exploit its bargaining power vis-à-vis downstream users (3) due to the possibility that the patent owner will be able to enjoin the manufacture, use, or sale of an end product that incorporates the patented invention, (4) in such a way as to threaten either (a) static deadweight losses far out of proportion to any likely increases in dynamic efficiency, or (b) dynamic efficiency losses due to downstream users' reduced incentives to invest in standard-specific technology or to engage in follow-up innovation." Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1153-1154 (2009).
[223] Suzanne Michel, *Bargaining for RAND Royalties in the Shadow of Patent Remedies Law*, 77 ANTITRUST L.J. 889, 911 (2011).
[224] *Id.*
[225] *Apple v. Motorola, 869 F.Supp.2d 901, 913 (N.D. Ill., 2012),* Research in Motion Ltd. v. Motorola, Inc., 644 F. Supp. 2d 788, 790-791 (N.D. Tex. 2008).
[226] Suzanne Michel, *Bargaining for RAND Royalties in the Shadow of Patent Remedies Law*, 77 ANTITRUST L.J. 889, 911 (2011).
[227] *See* Jonas Hein, *The Recent DOJ and FTC Policy Suggestions for Standard Setting Organizations- The Way out of Standard-essential Patent Hold-up?* 2(2) J. INTELL. PROP. & ENT. L. 339, 357, 359 (2013), Mark A. Lemley & Carl Shapiro, *Patent Hold-up and Royalty Stacking*, 85 TEX. L. REV. 1991, 2014 (2007), Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 INNOVATION POL'Y & THE ECON. 119, 130 (2001).
[228] *See* Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1153, 1161, 1163 (2009).
[229] *See* Mark A. Lemley & Philip J. Weiser, *Should Property or Liability Rules Govern Information?* 85 TEX. L. REV. 783, 786-788 (2007).
[230] *See* Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293, 1298, footnote 9 (1996).

V. Telecommunication Standards

The following Table 2-3 demonstrates a comparison of the three third generation (3G) telecommunication standards- the standards of CDMA 2000 ("Code Division Multiple Access 2000"), W-CDMA ("Wideband Code Division Multiple Access"), and TD-SCDMA ("Time Division Synchronous Code Division Multiple Access").[231] Generally speaking, the CDMA 2000 standard was developed and utilized in United States; the W-CDMA standard was developed and utilized in Europe; the TD-SCDMA was developed and utilized in China.[232]

Table 2-3 : Comparison of Three 3G Telecommunication Standards

	CDMA 2000	W-CDMA	TD-SCDMA
Developed by	Qualcomm Inc. (US-based)	Nokia Oyj and Ericsson AB (Europe-based)	Chinese Academy of Telecommunications, Datang, Huawei, ZTE, Siemens (China-based)
First launched, operator, country, (year)	SK Telecom, South Korea (October 2000)	NTT DoCoMo's FOMA, Japan (October 2001)	China Mobile Communications (Soft launch in April 2008)
2G version	CDMA One	Global System for Mobile communication ("GSM")	None
Standard accepted by	The 3rd Generation Partnership Project 2 ("3GPP2") [i]	The 3rd Generation Partnership Project ("3GPP") [ii]	3GPP
Where used	166 operators in 73 countries, 275 million subscribers (September 2006)	162 networks in service in 72 countries, representing almost 70% share of all 3G networks (June 2007)	1 operator (China Mobile Communications) (June 2008)
Major markets	The Americas	Europe and Japan	Likely to be China
Availability of handset products	950-plus (February 2006)	Over 650 (June 2007).	About 100 (May 2008) (developed by20 vendors). 30 manufacturers had TD-SCDMA handset production licenses (May 2008).
Duplexing scheme used	Frequency Division Duplex ("FDD") [iii]	Frequency Division Duplex (FDD)	Time Division Duplex ("TDD") [iv]

i. The participating associations are Association of Radio Industries and Businesses ("ARIB")/Telecommunication Technology Committee ("TTC") (Japan), China Communications Standards Association ("CCSA"), Telecommunications Industry Association ("TIA") (North America) and Telecommunications Technology Association ("TTA") (South Korea).
ii. The groups are the ETSI, ARIB/TTC (Japan), CCSA, Alliance for Telecommunications Industry Solutions (North America) and TTA.
iii. The FDD technology supports two-way radio communication by using two distinct radio channels.
iv. The TDD technology uses a single frequency to transmit signals in downstream and upstream directions.

Source: Nir Kshetri, Prashant Palvia & Hua Dai, p.40

[231] Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 400 (2011).
[232] *Id.*

The history of mobile telecommunication is pretty brief.[233] The first generation (1G) system was launched around 1980, and then new generations have been launched about every 10 years.[234] Figure 2-2 shows a graph of different mobile telecommunication generations.[235] As seen in the graph, the first generation (1G) started around 1980, the second generation (2G) after 1990, the third generation (3G) had its first deployment around 2000, and the fourth generation (4G) networks have been around since 2010.[236] It is reasonable to expect that a fifth generation (5G) system will be launched in 2020.[237]

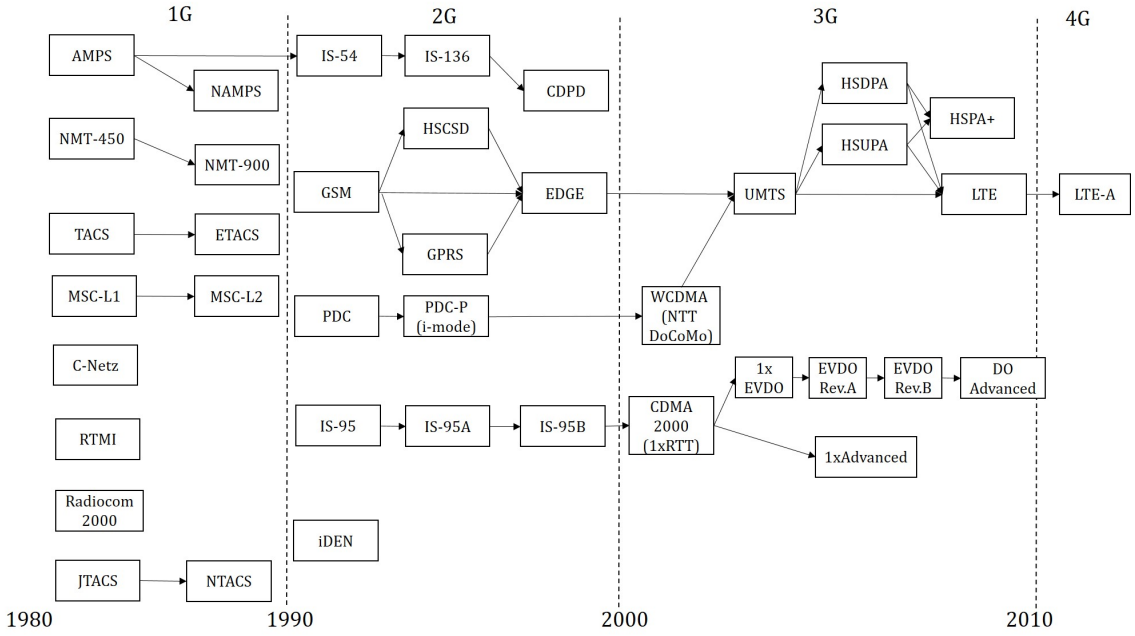


Figure 2-2: Different Generations of Mobile Telecommunication
Source: JUHA KORHONEN, p.27

[233] JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 26 (2014).
[234] *Id.*
[235] *Id.* at 27.
[236] *Id.* at 26, 28. 1G is analogue service and 2G is digital, while 3G refers to higher bandwidth packet switched networks. Neil Gandal, David Salant & Leonard Waverman, *Standards in Wireless Telephone Networks*, 27(5-6) TELECOMM. POL'Y 325, 325 (2003).
[237] JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 28 (2014). But improvements in performance, capacity, and services can be achieved within one generation by means of the existing basic technology. Because of this, the definition of a new generation is hardly a clear cut. *Id.*

Chapter 3 Standardization in the United States

This chapter discusses standardization in the United States. The beginning of this chapter reviews standardization history as a whole, explaining the origin and subsequent development of standard-setting activities in the world. The second part provides an overview of American standardization history, followed by a discussion of relevant legislation in the United States. The chapter then examines the role of the American government in standard-setting, and the development of standard-setting organizations ("SSOs") in the United States. The final part will focus on how the Code Division Multiple Access 2000 ("CDMA 2000") standard was formed, which is one of the global 3G telecommunication standards.

I. History of Modern Industrial Standards

Chapter 3 and Chapter 4 offer a discussion on American and Chinese standardization systems respectively. Prior to the introduction of these two states' systems, the dissertation provides an overview of the global standardization histories. The development of standardization can generally be summarized into four stages:

(1) standardization within private enterprises;
(2) private standardization organizations;
(3) national, regional, international standardization; and
(4) consortia standardization.

The following subsections explain these different stages in sequence.

A. Industrial Standards within Private Enterprises

Standardization within private enterprises emerged in the early Industrial Revolution during the second half of the 18th century.[238] This standardization began with uniform dimensions and interchangeability among products.[239] Then, the focus expanded to unification, simplification, modularization in product design, processes, and manufacturing.[240] Standardization within corporations increased the productivity of manufacture, as well as decreased the demand for skilled labors.[241] In the early 20th century, a company that was a recognized leader in the process of implementing industrial standards within a corporation in order to streamline mass production techniques was the Ford Motor Company.[242]

---

[238] Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 4 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016). *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 15-25 (1997).

[239] Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 5 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[240] *Id.*

[241] *Id.* at 23.

[242] *Id.* at 7.

B. Private Standardization Organizations

Private standardization organizations emerged in the middle of the nineteenth century.[243] During that time, the second Industrial Revolution accelerated industrialization and products became more sophisticated.[244] As a result, it became more difficult for any single corporation to complete the whole design or manufacturing process for the product.[245] Private standardization organizations were therefore established to coordinate the specialization and product division among companies in the industrial chain.[246] The organizations made corporations throughout an industrial chain to coordinate unification, simplification, and interchangeability in technical terms, improving the overall efficiency for the whole industry.[247] Standards developed by these private organizations were voluntary and by consensus.[248]

Representatives of these organizations included: the Institution of Civil Engineers ("ICE") founded in the U.K. in 1818, the Institution of Mechanical Engineers ("IMechE") founded in the U.K. in 1847, the American Society for Civil Engineering ("ASCE") founded in the U.S. in 1852, the American Society of Mechanical Engineering ("ASME") founded in the U.S. in 1880, and the American Institute of Electrical Engineering ("AIEE," the former Institute of Electrical and Electronics Engineers ("IEEE")) founded in the U.S. in 1884.[249]

C. National, Regional, International Standardization

National, international, and regional standardization organizations emerged in the late nineteenth and the early twentieth century.[250] Because of industrial and trade expansions across countries, these organizations were developed to resolve disputes about product incompatibility in international trade.[251] They drove countries to unify domestic standards and to efficiently allocate resources across borders.[252] National standardization organizations in developed countries predominantly originated from the private sector and non-profit, non-government organizations.[253] Thus, these organizations developed their voluntary standards under the principles of openness, transparency, and consensus.[254] In

---

[243] *Id.* at 23.
[244] *Id.* at 8.
[245] *Id.*
[246] *Id.* at 23. *See also* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 100, 104 (1997).
[247] Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 9 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).
[248] *Id.* at 10. *See also* U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS footnote 7 (2013).
[249] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 44 (2014).
[250] Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 23 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).
[251] *Id.* at 12, 23.
[252] *Id.* at 12.
[253] *Id.* at 13, 23.
[254] *Id.*

contrast, developing or least developed countries had poor industrialization and incompetent standardization.[255] Standardization was initiated by mainly government institutions that organized and operated national standardization organizations.[256]

Representatives of these national standardization organizations were: the Engineering Standard Committee ("ESC") founded in the U.K. in 1901 and the former British Standard Institute ("BSI"), the Deutsches Institut für Normung e. V. ("DIN") founded in Germany in 1917, the American Engineering Standards Committee ("AESC") founded in the U.S. in 1918 and the former American National Standard Institute ("ANSI"), and the State Committee of the Russian Federation for Standardization and Metrology ("GOST R") founded in 1925 in Russia.[257]

National, regional, and international standardization organizations developed at nearly the same time, so it is difficult to draw a clear time distinction among them.[258] The representative regional and international standardization organizations were: the International Electrotechnical Commission ("IEC") founded in 1906, the International Federation of the National Standardizing Associations ("ISA") founded in 1926, the International Organization for Standardization ("ISO") founded in 1947, and the European Telecommunications Standards Institute ("ETSI") founded in 1988.[259]

D. Consortia Standardization

Consortia standardization emerged in the late twentieth century and early twenty first century.[260] Because of rapid-changing microelectronic technology, traditional methods of standardization presented significant challenges for the information and communication technology ("ICT") industry.[261] The ICT industry demanded a more flexible method and

---

[255] *Id.* at 23

[256] *Id. But see* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 104 (1997).

[257] Jay Tate, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE 442, 446-455, 463-468 (Peter A. Hall & David Soskice ed., 2001), ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 60 (2014), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 22 (1997).

[258] Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 14 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[259] *Id.* at 14-15. *See also* CRAIG N. MURPHY & JOANNE YATES, THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO): GLOBAL GOVERNANCE THROUGH VOLUNTARY CONSENSUS (1st 2009), MILTON L. MUELLER, NETWORKS AND STATES: THE GLOBAL POLITICS OF INTERNET GOVERNANCE (1st 2013), MURPHY, CRAIG N. & YATES, JOANNE , THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO): GLOBAL GOVERNANCE THROUGH VOLUNTARY CONSENSUS 11, 23 (1st 2009).

[260] CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 23 (1997), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 16, 23 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[261] CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 23 (1997), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 16-17, 23 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at*

simplified process for standards development.[262] Thus, consortia standards diversified traditional methods of standardization.[263] Representative entities of consortia standardization were: the Standard Generalized Markup Language Open ("SGML Open") founded in the U.S. in 1993 and the predecessor of the Organization for the Advancement of Structured Information Standards ("OASIS"), and the World Wide Web Consortium ("W3C") founded in the U.S. in 1994.[264]

The following **Error! Reference source not found.** offers a summary of modern standardization development.

Table 3-1: General Overview of Modern Standardization Development

Stage	Time Period	Content
Standardization within private enterprises	The second half of the18th century	Focusing on unification, simplification, modularization, interchangeability within a private corporation
Private standardization organizations	Mid-19th century	Coordinating unification, simplification, and interchangeability throughout an industrial chain
National, regional, international, standardization	The late 19th century and early 20th century	Solving disputes about incompatible products in international trade
Consortia standardization	The late 20th century and early 21st century	Affording flexible methods and simplified procedures for standardization

Source: Compiled by the author

II. American Standardization History

Different countries have various standardization systems due to different incentives, culture, history, and economic development. Among the different systems, some standardization efforts were led by the government, while others were led by the private sector.[265] Because of the variety of national standards, the potential to conflict with one another will continue to grow and vary.[266] Of all the advanced industrialized nations, the United States' standardization system is without a doubt the most institutionally

---

http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[262] CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 23 (1997), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 23 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[263] CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 23, 125 (1997), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 23 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[264] *Id.* at 17

[265] *See* Jay Tate, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE 442, 471 (Peter A. Hall & David Soskice ed., 2001).

[266] *Id.*

heterogeneous and fragmented.[267] The standardization system also reflects American political culture for market-based and pluralist solutions.[268] Given this deregulatory political environment, private sector solutions are likely to be favored and viable in the market.[269]

The American approach to standardization is considered an extreme manifestation of liberalism and the most disperse system compared to other nations.[270] Like the history of the United States, the American standardization system has "strong traditions of voluntarism, local control, meritocracy, rights to represent one's own interests, and a marked preference for private coordination of commercial activity."[271] It has been the private sector that lead the standard-setting process, while the government has avoided taking a direct role in the process.[272] In American standardization history, standard-setting institutions have not changed much, and still remain a decentralized and pluralistic constellation of institutions.[273] Within this dynamic and competitive context, each institution pursues standardization to satisfy its own objectives.[274]

The American voluntary standardization system has both its advantages and disadvantages. While disorganized, the United States' decentralized governance of standards development gives voice to a diversity of opinions and approaches.[275] The United States' bottom-up, informal, flexible, market-led approach also provides open access.[276] Both the diversity and open access helped the domestic industry respond quickly to new

---

[267] *Id.* at 463. *See also* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 14 (1992).
[268] U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 3 (1992).
[269] *Id.* at 20.
[270] Jay Tate, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE 442, 471 (Peter A. Hall & David Soskice ed., 2001), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 14 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).
[271] Andrew L. Russell, *Industrial Legislatures: The American System of Standardization*, *in* INTERNATIONAL STANDARDIZATION AS A STRATEGIC TOOL: COMMENDED PAPERS FROM THE IEC CENTENARY CHALLENGE 2006 70, 71-72 (Int'l Elec. Comm'n ed., 2006). *See also* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 14 (1992).
[272] *See* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 3 (1992).
[273] Andrew L. Russell, *Industrial Legislatures: The American System of Standardization*, *in* INTERNATIONAL STANDARDIZATION AS A STRATEGIC TOOL: COMMENDED PAPERS FROM THE IEC CENTENARY CHALLENGE 2006 71 (Int'l Elec. Comm'n ed., 2006). *See also* Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 105(2009), Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).
[274] Andrew L. Russell, *Industrial Legislatures: The American System of Standardization*, *in* INTERNATIONAL STANDARDIZATION AS A STRATEGIC TOOL: COMMENDED PAPERS FROM THE IEC CENTENARY CHALLENGE 2006 70, 71 (Int'l Elec. Comm'n ed., 2006).
[275] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIV (2013). *See also* Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 105(2009), Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).
[276] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIII, 49 (2013).

challenges that arose due to rapidly-changing technology and disruptive market shifts.[277] On the other hand, the United States tends to experience intense conflicts in its voluntary standardization system.[278] Standard-setting organizations in the United States not only compete with one another to write standards, they also write conflicting standards.[279] The American system has a limited capacity to address conflicts and coordinate appropriate responses for diverse standard-setting stakeholders.[280] These unsolved conflicts and disagreements not only distract from the main purposes of setting standards, but also undermine the legitimacy of the standardization system.[281] The American standardization system has also been criticized for lacking sufficient openness and transparency, and that it fails to provide equal standard-setting access for all stakeholders, particularly for small enterprises and end-users.[282] The exploitation of standard essential patents ("SEPs") as strategic weapons also poses another concern as it delays, obstructs, or prohibits standards development.[283] Therefore, it raises much concern whethter the traditional private sector, voluntary consensus system could work well in the future.[284]

The development of the American voluntary standardization system is an evolving process. The American standardization history can be generally separated into three phases: [285]

(1) The colonial era to roughly 1900s: standard development arose from common usage or market acceptance;
(2) The 1900s to the 1980s: standardization originated from a collaborative process among private institutions, such as engineering societies, trade associations; and
(3) The 1980s to the present: industry consortia became increasingly prominent in standard-setting, particularly in the ICT industry.

The following subsections offer a detailed description of each developmental phase.

A. Colonial Era – 1900: *De Facto* Standards Phase

1. Before the 1860s: Industrial Associations

In American colonial history, the experience of British imperial power conditioned early American politicians and citizens to mistrust concentrated governmental authority.[286] Unlike Western European nations, the United States never pursued standardization under

---

[277] *Id.* at XIII, XIV.
[278] *Id.* at XIV. *See also* David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 573(2006), U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS footnote 7 (2013), *See also* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 306 (1998), ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 10 (1990).
[279] U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 48 (1992).
[280] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIV, 49 (2013).
[281] U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 12 (1992).
[282] *Id.* at XIV, XV.
[283] *Id.* at XV.
[284] *See* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 3 (1992).
[285] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 18-19, 266-271(2014).
[286] *Id.* at 266.

governmental oversight.[287] Rather, the United States developed its standards through *de facto* standards, which originated from the practice of interchangeable-parts manufacturing in various machines tool-based industries.[288] Therefore, the American standard development organizations first emerged in the private sector, in response to specific marketplace needs and governance concerns.[289]

Not relying on the federal government to coordinate economic activities, antebellum Americans were prolific in forming private industrial associations.[290] Among these private voluntary associations, some associations facilitated stable relationships among various market participants, such as the Chicago Board of Trade.[291] Others conducted investigations and issued technical proposals, such as the Philadelphia's Franklin Institute.[292] These industrial associations were formed to pursue the common interests of the founders—commercial and manufacturing corporations.[293] The combination of these associations therefore helped Americans develop technical standards, harmonizing crucial aspects of industrial production.[294] Under these circumstances, these associations performed significant commercial and technical functions in standardization, although they did not have the legal authority to enforce compliance with their suggested standards.[295]

2. 1860s-1900s: Standard-Setting Committees

These voluntary industrial and corporate associations were largely absent from history during the late nineteenth-century American industrial economy.[296] Instead, between the 1860s and 1900s, engineering societies and trade associations formed a variety of standard-setting committees, establishing and disseminating standards for industrial tools, processes, and products.[297] Standard-setting committees can in some ways be considered an organizational response to the disorder that industrial capitalism brought to American society.[298] Examples of these committees are: the American Institute of Mining Engineering ("AIME") founded in 1871, ASME founded in 1880, AIEE founded in 1884, and the American Society for Testing Materials ("ASTM") founded in 1898.[299]

---

[287] *Id. See also* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 39 (1992).
[288] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 18-19, 266 (2014).
[289] *See* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 39 (1992).
[290] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 18-19, 266 (2014).
[291] *Id.* at 42-43, 266-267.
[292] *Id.*
[293] *Id.* at 25.
[294] *Id.*
[295] *Id.* at 267.
[296] *Id.* at 25.
[297] *Id.* at 26, CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 20 (1997).
[298] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 27 (2014).
[299] *Id.* at 44, 54, CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 21 (1997), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 9 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016). Among the U.S. standard-setting committees, the American Society for Civil Engineering ("ASCE") is the earliest, founded in 1852, reorganized in 1867. ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 44 (2014).

These standard-setting committees have some common characteristics.

- Firstly, all these participants joined the committees in response to the efficiency and profitability demands of their daily practice.[300] The federal government therefore did not play an aggressive role in standards development.[301]
- Secondly, the standard-setting committees grew to welcome all interested parties i.e. corporate engineers and managers who recognized they would be affected by the standard-setting results.[302]
- Thirdly, engineer participants embraced increasingly formal rules to prevent any single interested party from dominating the process in standard-setting committees.[303] The purpose of this was to avoid any single powerful institution from monopolizing standardization, such as General Electric or Western Union.[304]
- Finally, the committees grew to serve a significant function in professional societies, creating connections between the development of standardization and the values of professionalism.[305]

These standard-setting committees were important in their own era and in later eras. From the 1860s to 1900s, American standards development was transitioning from chaos and critiques of existing industrial order to widespread voluntary cooperation and deference to orderly designs of expert minds.[306] The expert committees in standard-setting not only facilitated the existence of multiple supply sources, but also helped small and medium corporations avoid the specter of a monopoly.[307] The standard-setting committees therefore maintained fluidity in a dynamic industrial economy during the late nineteenth century.[308] These committees formed institutional and ideological precedents that telecommunication and computer engineers continued to use well into the late twentieth century.[309]

B. 1900- 1980s: Consensus Standards Phase

1. 1900s-1940s: Consensus Standardization

Post-1900s marked a fundamental shift in American standardization development, shifting from standard-setting committees to collaborative and consensus standardization.[310] These consensus standards emerged because of growing jurisdictional overlap when conflicts arose and an increase in the pace and scope of standardization activities.[311] At the time, the industry recognized the significance of standardizations, but lacked systematic or formal channels of communication or coordination, which undermined

---

[300] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 56 (2014).
[301] *Id.*
[302] *Id.*
[303] *Id.* at 56-57.
[304] *Id.*
[305] *Id.* at 57.
[306] *Id.* at 57, 267.
[307] *Id.* at 26.
[308] *Id.*
[309] *Id.*
[310] *Id.* at 268.
[311] *Id.* at 267. *See also* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 48 (1992).

the ordering and rationalization at the core of industrial standardization.[312] Under these circumstances, it was formed in 1918 the American Engineering Standards Committee ("AESC"), the former American Standards Association ("ASA") and ANSI.[313] Serving as a coordinator for standardization activities, the AESC aligned closely with trade associations and government agents of commerce and capital.[314] The AESC aimed to form a federalist structure and process to resolve jurisdictional conflicts at different levels, such as conflicts between enterprises, conflicts between standard-setting committees, conflicts between industry and government, and conflicts between the United States and other nations.[315]

The development of AESC is shown in Table 3-2.[316] Flourishing in the 1930s and 1940s, AESC's model of consensus standardization demonstrated the principles of openness, transparency, and inclusiveness.[317] Under this model, standard-setters shared information, resolved technical conflicts, and as a result, reduced waste and inefficiency.[318] Standardization can be negotiated by anyone with an interest in the outcome, rather than simply being dominated by a powerful institution.[319] This consensus model within "industrial legislature" was considered superior to adversarial conflicts in existing government institutions.[320] Self-regulation in the industry may potentially help ensure prosperity and social harmony.[321] More importantly, the AESC founded key principles and

---

[312] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 60, 267-268 (2014). *See also* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 95 (1997), U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 48 (1992).
[313] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 60 (2014), Jay Tate, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE 442, 446-455, 463-468 (Peter A. Hall & David Soskice ed., 2001), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 22 (1997), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 13-14 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016). AESC was founded in 1918 and renamed ASA in 1928, then reorganized as the United States of America Standards Institute ("USASI") in 1966, and finally changed its name to ANSI in 1969. AM. NATI'L STANDARDS INST., 1918-2008 ANSI: A HISTORICAL OVERVIEW, U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 48-49 (1992).
[314] SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 101 (1997), ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 268 (2014), U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 48 (1992), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 14 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).
[315] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 61 (2014)
[316] *Id.* at 91.
[317] *Id.* at 61-62, 268.
[318] *Id.* at 93.
[319] *Id.*
[320] *Id.* at 268.
[321] *Id.*

formative practices—consensus, due process, and balance of interests.[322] The AESC consensus model had long-term significance in ideology and the institutional framework.[323]

Table 3-2: Membership, Participation, and Products in AESC

Year	Member Bodies	Participating Organizations	American Standards
1923	23	235	48
1928	36	350	111
1938	67	~600	667
1945	96	650	1,507

Source: ANDREW RUSSELL, p.91

2. 1930s-1970s: Consensus vs. Monopoly

After the consensus model became common in standard-setting, another significant issue arose: "Is the consensus standardization model compatible with monopoly firms' efforts in standardization?" or "How do monopoly firms develop standards to fit within the consensus model?"[324] During the 1930s and 1970s, American policymakers and the private sector articulated critiques of centralized control that shaped new regulation models as well as new products and services.[325] One example of a strong critique was one directed at AT&T in the telecommunication industry as well as one at IBM in the computer industry.[326] The American antitrust regulators not only constrained AT&T's and IBM's actions, but also yielded to an increasingly strong entrepreneurial push to develop new technologies and services.[327]

During the 1970s, the critique of centralized control eventually grew into a broad-based ideological consensus: constraining corporate power, exploiting new technological advances, and seeking efficiency and innovation through market competition and private ordering.[328] Although the critiques were directed towards AT&T and IBM at the time, the critiques converged on a common coordinating mechanism for industrywide standards: a loose network of standards committees that operated beyond the reach of any dominant company.[329] By the early 1980s, the threat of monopoly power and central control in the telecommunication and computer industries had been tempered by governmental regulatory powers of the Federal Communications Commission ("FCC") and Department of Justice ("DOJ").[330] The absence of monopolization and centralization also fit the change of telecommunication and computer technology that pursued innovation, entrepreneurship,

[322] *Id.* at 61, 94. However, the meaning of due process is not a constant, and has changed throughout American history. Agreement regarding the meaning of open and fair standardization process also changes over time and in different circumstances. U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 18 (1992).
[323] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 92, 94 (2014).
[324] *Id.* at 95, 157.
[325] *Id.* at 269.
[326] *Id.* at 132.
[327] *Id.*
[328] *Id.* at 157.
[329] *Id.* at 133.
[330] *Id.* at 133-143, 159.

and competition.[331] Under these circumstances, the voluntary standards committees then became the primary mechanism to coordinate industrywide technological change.[332]

C. 1980s-Present: Consortia Phase

After the 1980s, industry consortia started to play a significant role in American standardization development.[333] The United States is considered home for most of ICT industry consortia, and the existence of industrial consortia is a unique phenomenon in comparison to worldwide standardization systems.[334] The consortia were particularly prominent in ICT industries, because these industries needed new coordination mechanisms to reorganize the technological world—one where their economic, cultural, and political foundations appeared in flux.[335] The participants of these consortia varied, consisting of partnerships that ran across different levels:[336]

> They may be horizontal (among competitors), vertical (between integrators and suppliers), or comprised of firms providing complementary products and services. They may develop specifications, patentable technology, or tools and platforms. They may be structured as stock companies, exclusive non-profit organizations, open trade associations, or ad hoc interest groups.

Industry consortia boomed in entire sectors of the 1990s high-tech economy.[337] Examples of consortia in the computer networking industry are: CableLabs founded in 1988, Video Electronics Standards Association ("VESA") founded in 1989, Asynchronous Transfer Mode Forum ("ATM Forum") founded in 1991, and W3C.[338] Since the consortia distinctly targeted specific features, the consortia model coexisted with and did not replace the existing consensus model. The consortia focused more on market dynamics of scale and scope.[339] Unlike its predecessors in engineering societies, the consortia preferred to quickly disseminate a pragmatic solution rather than to pursue new knowledge at length.[340] The consortia standardization filled the gap where old models of hierarchical and consensus standardization failed as a result.[341] However, consortia are often exclusive groups operating in a relatively closed environment, which might raise much concern with regard to due process.[342]

---

[331] *See id.* at 142, 159-160.
[332] *Id.*
[333] *See* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 23 (1997).
[334] Han-Wei Liu, *International Standards in Flux: A Balkanized ICT Standard-setting Paradigm and Its Implications for the WTO*, 17(3) J. INT'L ECON. L. 551, 551, 577 (2014).
[335] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 271 (2014), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 23 (1997), U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 51 (1992).
[336] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 272 (2014). *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 31 (1997).
[337] *Id.* at 274, CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 23 (1997).
[338] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 273-274 (2014).
[339] *Id.* at 274. *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 125 (1997).
[340] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 274-275 (2014), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 125, 127 (1997).
[341] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 274 (2014).
[342] U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 51 (1992). *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 29 (1997).

Just as the consensus standardization model did, the consortia model faced the same problem of hasty, overlapping, conflicting, and confusing standards. The problem was also caused by the disorganized, uncoordinated, competing, and ad hoc organization of consortia.[343] Although they emerged as a new model at the end of the twentieth century, consortia standardization recreated the same coordination problems that had troubled standard-setting engineers since the beginning of the century.[344] Even now, the problem of overlapping and conflicting standards remains an issue in American voluntary standardization systems.

D. Summary

Table 3-3 below summarizes American standardization development history.

Table 3-3: American Standardization Development History

Phase	Time	Standard-Setting Bodies	Representative Entity
De Facto Standards	Before 1860s	Private voluntary industrial associations, composed of representatives from commercial and manufacturing enterprises	Chicago Board of Trade, Philadelphia's Franklin Institute
	1860s-1900s	• Standard-setting committees, composed of engineering societies and trade associations • Created chaos, criticism, and mistrust of market	AIME (1871), ASME (1880), AIEE (1884)
Consensus Standards	1900s-1940s	• A formal national voluntary consensus standard body with a federalist structure to resolve jurisdictional conflicts • Standardization under principles of consensus, openness, transparency, due process, and balance of interests	AESC (1918), ASA (1928)
	1930s-1970s	• Compatibility and competition between monopoly firms and consensus models in technological standard-setting • Preference towards a loose standardization network	AT&T, IBM
Industry Consortia	1980s-present	• Industry consortia, composed of firms with various competing, supplying, or complementary relationships • Prominent in ICT industries	CableLabs (1988), VESA (1989), ATM Forum (1991), W3C (1994)

Source: Compiled by the author

The United States has a decentralized standardization system, and its standardization development occurs through standards-setting processes promulgated by voluntary SSOs.[345] There are approximately 50,000 private-sector voluntary standards developed by

[343] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 276 (2014).
[344] *Id.*
[345] Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 105(2009). *See also* Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).

over 600 SSOs.[346] As shown in the **Error! Reference source not found.**, these SSOs consisted of the following:[347]

- Approximately 130 scientific and professional societies that had developed approximately 14,000 standards (E.g. ASME, Acoustical Society of America, American Society of Safety Engineers);[348]
- Approximately 300 trade associations that had developed around 16,000 standards (E.g. Telecommunications Industry Association ("TIA"), Aerospace Industries Association);[349]
- Approximately 40 formal Standard Developing Organizations ("SDOs") that had formulated around 17,000 standards (E.g. IEEE, ASTM, Electronic Industries Association ("EIA"));[350] and
- Approximately 150 industrial consortia that had formulated around 2,000 standards (E.g. VESA, W3C).

---

[346] *See* U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS footnote 7 (2013), Robert B. Toth, *The U.S. Standardization System: A New Perspective, in* STANDARDIZATION ESSENTIALS: PRINCIPLES AND PRACTICE 131, 135 (Steven M. Spivak & F. Cecil Brenner ed., 2001). *See also* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHOOSE NATIONS, 105-108 (1997), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 1, 12 (1997), *See also* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 306 (1998), ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 4 (1990), Justus Baron & Daniel F. Spulber, *Technology Standards and Standards Organizations: Introduction to the Searle Center Database* 2 (2015), available at http://www.law.northwestern.edu/research-faculty/searlecenter/innovationeconomics/documents/Baron_Spulber_Searle%20Center_Database.pdf (last visit date: Apr. 22, 2016).

[347] Robert B. Toth, *The U.S. Standardization System: A New Perspective, in* STANDARDIZATION ESSENTIALS: PRINCIPLES AND PRACTICE 131, 132-135 (Steven M. Spivak & F. Cecil Brenner ed., 2001), ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 23-25 (1990), U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 49-51 (1992), AM. NAT'L STANDARDS INST., OVERVIEW OF THE U.S. STANDARDIZATION SYSTEM, *available at* http://www.standardsportal.org/usa_en/standards_system.aspx (last visit date: Apr. 22, 2016). *See* Chapter Two for further discussion on the classification and different types of standards.

[348] In addition to their professional and educational roles, the groups also developed standards. Robert B. Toth, *The U.S. Standardization System: A New Perspective, in* STANDARDIZATION ESSENTIALS: PRINCIPLES AND PRACTICE 131, 135 (Steven M. Spivak & F. Cecil Brenner ed., 2001). These scientific and professional societies aim to advance theory and practice in a technical field, and thus have a strong engineering bent. U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 50 (1992).

[349] Among the SSOs, the trade associations maybe the most homogeneous and exclusive, because they were often created specifically to promote their industries' needs. U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 49 (1992).

[350] The formal SDOs were founded specifically to develop standards. ASTM can be classified as a formal SDO because many of its member organizations serve as secretariats for ANSI-accredited committees. Robert B. Toth, *The U.S. Standardization System: A New Perspective, in* STANDARDIZATION ESSENTIALS: PRINCIPLES AND PRACTICE 131, 135 (Steven M. Spivak & F. Cecil Brenner ed., 2001).

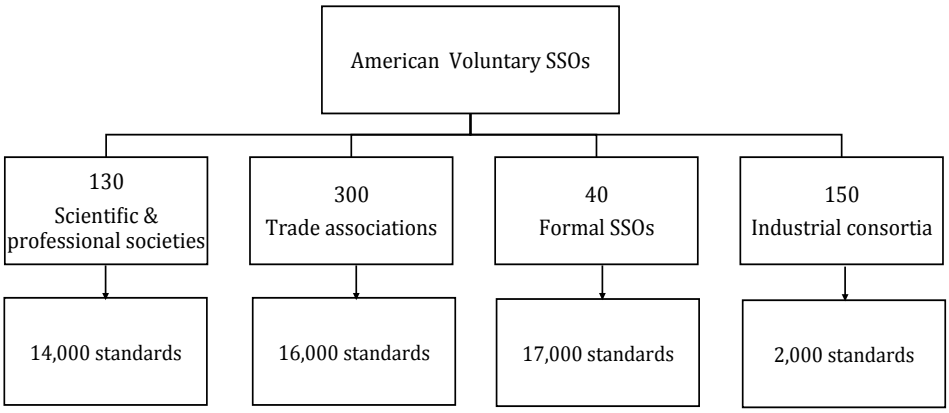


Figure 3-1: Voluntary SSOs and Standards in the United States
Source: Robert Toth p.133-134

III. American Standardization Legislation

Current legislation regarding standardization was established after the late twentieth century. It was a time when voluntary SSOs and industry consortia became the primary institutions to form standards.[351] Primary legislation included: the National Cooperative Research Act of 1984 ("NCRA"), the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), and the Standards Development Organization Advancement Act of 2004 ("SDOAA").[352] The following is an introduction of such legislation.

A. The National Cooperative Research Act of 1984

The NCRA assured the legitimacy of industry consortia and tempered the crisis of the standardization process in consortia.[353] Since 1980s, industry consortia started to criticize the standardization process in the formal national and international consensus standard-setting bodies.[354] The consortia moreover rejected and subverted the principles of balance, transparency, openness, and due process in the consensus model.[355] However, these principles for voluntary consensus standardization had been developed since the 1900s, and were not challenged to a significant degree. Given the situation, the consortia's rejection and subversion of the principles eventually amounted to a crisis of the consortia's legitimacy in technological standardization.[356]

---

[351] *See* Chapter Two for further discussion regarding the relationships between voluntary SSOs and industry consortia.
[352] *See* ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 277, footnote 31 (2014). *See also* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 15 (1992).
[353] *Id.* at 276.
[354] *Id.*
[355] *Id.,* Raymund Werle & Eric J. Iversen, *Promoting Legitimacy in Technical Standardization*, 2 SCI., TECH. & INNOVATION STUDIES 19 (2006).
[356] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 276 (2014), Raymund Werle & Eric J. Iversen, *Promoting Legitimacy in Technical Standardization*, 2 SCI., TECH. & INNOVATION STUDIES 19 (2006).

To overcome the crisis on consortia's legitimacy, standard engineers, entrepreneurs, and consultants lobbied to persuade Congress and the American presidential administration the merits of the NCRA.[357] These lobbying efforts were ultimately successful, because the government recognized the benefits of having timely standards that met the needs of a rapidly-changing market.[358] Passing the NCRA also marked the advent of industry consortia, where the government intentionally facilitated collaboration among firms to promote the research and development of innovative technologies.[359]

B. National Technology Transfer and Advancement Act of 1995

The Federal Government recognized the benefits of voluntary consensus standards.[360] The NTTAA was therefore designed to strengthen the American government's role as a sophisticated user or consumer of private sector innovations.[361] The NTTAA mandated that federal agencies use voluntary consensus standards in procurement, except where inconsistent with law or was otherwise impractical.[362] This mandatory requirement enabled agencies to purchase off-the-shelf commercial products and not more costly, custom-made products.[363] Accordingly, the NTTAA clarified the American government's position regarding standardization.[364] The voluntary consensus standards replaced the government-developed standards, and then accomplished the government's regulatory and administrative objectives.[365]

The NTTAA also increased the significance of the National Institute of Standards and Technology ("NIST") in standard-setting activities. The NTTAA designed NIST to coordinate government technical standards activities, as well as private sector technical standards activities.[366] This design therefore made NIST responsible for coordinating federal agencies' utilization of technical standards developed by voluntary consensus standard-setting

---

[357] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 276 (2014).
[358] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129 (Sherrie Bolin ed., 2005).
[359] *Id.*
[360] U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS footnote 6 (2013).
[361] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 41 (2013).
[362] *Id*., Peter L. Strauss, *Private Standards Organizations and Public Law*, 22 WM. & MARY BILL RTS. J. 497, 504 (2013), D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129 (Sherrie Bolin ed., 2005).
[363] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 41 (2013).
[364] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129 (Sherrie Bolin ed., 2005). *See also* Wolf, Tyler R.T., *Existing in a Legal Limbo: The Precarious Legal Position of Standards-Development Organizations*, 65 WASH. & LEE L. REV. 813 (2008).
[365] Jane K. Winn, *US and EU Regulatory Competition and Authentication Standards in Electronic Commerce 4-5* (2006), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=901324 (last visit date: Sep. 28, 2014). *See also* Wolf, Tyler R.T., *Existing in a Legal Limbo: The Precarious Legal Position of Standards-Development Organizations*, 65 WASH. & LEE L. REV. 813 (2008).
[366] National Technology Transfer and Advancement Act of 1995 §12(b).

bodies.[367] The agencies also were required to report to NIST on their progress in utilizing voluntary consensus standards.[368] On the other hand, this design of coordinating private standard-setting activities led NIST to develop a special relationship with ANSI.[369] The two institutions NIST and ANSI eventually collaborated to establish the National Standards Strategy ("NSS") in 2000, and the United States Standards Strategy ("USSS") in 2005.[370] By means of more unified national standard-setting strategies, the NSS and USSS aimed to enhance the nation's competitiveness.[371]

C. Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities

In 1998, the Office of Management and Budget ("OMB") revised its existing Circular A-119, issued in 1982, to establish policies on Federal use and development of voluntary consensus standards.[372] The 1982 version of OMB Circular A-119 was the first official standards policy that the American government adopted.[373] This executive order only required federal agencies to use voluntary consensus standards whenever possible, and it lacked enforcement mechanisms to ensure its use.[374] The NTTAA of 1995 codified the 1982 version of Circular A-119, and more importantly, established reporting requirements for the OMB to Congress.[375] In 1998, OMB then revised Circular A-119 to not only make the terminology used in Circular A-119 consistent with the NTTAA, but also issue guidance for federal agencies making reports to the OMB.[376] Together, the NTTAA and revised OMB Circular A-119 requested federal agencies to report to the OMB their progress in adopting

---

[367] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129 (Sherrie Bolin ed., 2005).
[368] *Id.* But, this reporting requirement might be obviously contrary to the strict interpretation of the NTTAA. D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129 (Sherrie Bolin ed., 2005).
[369] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129 (Sherrie Bolin ed., 2005).
[370] *Id.*
[371] *Id.*
[372] Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities section 1. *See also* CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 35 (1997), Peter L. Strauss, *Private Standards Organizations and Public Law*, 22 WM. & MARY BILL RTS. J. 497, 504 (2013).
[373] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 126 (Sherrie Bolin ed., 2005). *See also* U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 55-56 (1992).
[374] U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 55 (1992), D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 126, 129, footnote 109 (Sherrie Bolin ed., 2005). *See also* Tyler R.T. Wolf, *Existing in a Legal Limbo: The Precarious Legal Position of Standards-Development Organizations*, 65 WASH. & LEE L. REV. 807, 812-813 (2008), Peter L. Strauss, *Private Standards Organizations and Public Law*, 22 WM. & MARY BILL RTS. J. 497, 504 (2013).
[375] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 126 (Sherrie Bolin ed., 2005). *See also* Peter L. Strauss, *Private Standards Organizations and Public Law*, 22 WM. & MARY BILL RTS. J. 497, 504 (2013).
[376] Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities section 1.

voluntary consensus standards.[377] The codification therefore put some teeth into this reporting requirement.[378]

Titled the "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities," this revised OMB Circular A-119 governed the inclusion of private voluntary standards in federal procurement practices.[379] The Circular not only emphasized the virtues of voluntary consensus standardization procedures, but also provided many instructions and procedures for the federal agencies to follow.[380] For example, the Circular defines voluntary consensus standards as those developed through a process entailing openness, balance of interest, due process, an appeals process, and consensus.[381] Another example of the Circular's new changes was in the information federal agencies are required to report to NIST each year, which NIST then transmits to the OMB.[382] The information transmitted includes: the exception and reason the agency used government-unique standards in lieu of voluntary consensus standards, the number of voluntary consensus standards bodies the agency and its employees participated in, the number of voluntary consensus standards the agency has used since its last report, identification of voluntary consensus standards that have been substituted for government-unique standards.[383] As a result, the federal rules provide clearer guidance on accelerating the conversion within federal agencies from compulsory government-unique standards to voluntary private consensus standards.[384]

D. Standards Development Organization Advancement Act of 2004

Congress passed the SDOAA in order to promote cooperative standard setting.[385] Unduly harsh antitrust scrutiny for standard-setting efforts may potentially deter desirable collaborative activities.[386] Given these concerns, SDOAA protects cooperative standard-setting activities by applying the rule of reason.[387] SDOAA mandates the rule of reason

---

[377] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129, footnote 109 (Sherrie Bolin ed., 2005).
[378] *Id.*
[379] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 277, footnote 31 (2014).
[380] *See* Andrew L. Russell, *Standardization in History: A Review Essay with an Eye to the Future*, *in* THE STANDARDS EDGE: FUTURE GENERATION 247, 254 (Sherrie Bolin ed., 2005).
[381] D. Linda Garcia, Bethany L. Leickly, & Scott Willey, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117, 129 (Sherrie Bolin ed., 2005).
[382] Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities section 9.
[383] *Id.*
[384] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 41 (2013). In Feb. 2014, the OMB requested public comment on proposed revisions to the current (1998-version) Circular A-119, *available at* https://www.federalregister.gov/articles/2014/02/11/2014-02891/request-for-comments-on-a-proposed-revision-of-omb-circular-no-a-119-federal-participation-in-the (last visit date: Aug. 25, 2015).
[385] AM. BAR ASS'N , HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING 17, 35 (2d ed. 2011), Wolf, Tyler R.T., *Existing in a Legal Limbo: The Precarious Legal Position of Standards-Development Organizations*, 65 WASH. & LEE L. REV. 813, 847-848 (2008).
[386] AM. BAR ASS'N , HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING 17, 35 (2d ed. 2011).
[387] *Id.* at 130.

analysis rather than *per se* treatment in any action against an SSO that registers its activities with the Federal Trade Commission ("FTC") and Department of Justice ("DOJ").[388]

Aiming to encourage the development and promulgation of standards, the SDOAA also limits antitrust liability for SSOs that notify their activities to the FTC and DOJ.[389] The Act limits the antitrust liability to actual damages only, rather than treble damages.[390] However, the limitation of liability is merely applicable to the SSO itself; the Act explicitly excludes from its coverage the parties who participate in standard-setting activities.[391] Individual SSO members participating in unlawful standard-setting activities may still be held liable for the treble damages of antitrust liability.[392]

IV. The Role of American Government

This section discusses how the American government fosters and shapes its standardization system, as well as how the government's role evolves over time.[393] The American government's role can generally be described through its direct and indirect actions. Direct government actions entail developing national standard-setting laboratories, and establishing *de jure* standards.[394] With regard to indirect actions, the government's antitrust regulation and intellectual property ("IP") regulation are two of the most important areas of indirect action.[395] The regulation of IP or SEPs will be discussed in Chapter 5. This part will only discuss the government's antitrust regulation and its influence on the standard-setting system in the United States.

A. Direct Role: Standard-setting Labs and De Jure Standards

In response to the establishment of national standard-setting laboratories in Germany and Britain, Congress created the National Bureau of Standards ("NBS") in 1901, and the NBS changed its name to NIST in 1988.[396] The original purpose of creating NBS was to

---

[388] *Id.* at 17, 35, 130.
[389] *Id.* at 170.
[390] *Id.* at 22.
[391] *Id.* at 22,171, Wolf, Tyler R.T., *Existing in a Legal Limbo: The Precarious Legal Position of Standards-Development Organizations*, 65 WASH. & LEE L. REV. 813, 848 (2008).
[392] Wolf, Tyler R.T., *Existing in a Legal Limbo: The Precarious Legal Position of Standards-Development Organizations*, 65 WASH. & LEE L. REV. 813, 848 (2008), AM. BAR ASS'N , HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING 171 (2d ed. 2011).
[393] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013).
[394] *Id.*
[395] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 14 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016). *See also* Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 109 (2009).
[396] *See* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 87-88 (1997), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 21 (1997), ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 5 (1990), DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 288-290 (1997), Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 12 (Progress & Freedom

coordinate the rapid proliferation of technical standards, and to enforce scientific research in the Bureau's laboratories.[397] In the beginning, NBS just focused its efforts narrowly on standards for optics, weights, measurements, and heat.[398] Over time, it expanded its mission to include electricity research and materials quality testing, as well as providing technical assistance and product evaluations for regulatory bodies.[399] Notwithstanding its expanding mission, never has NBS played a role at comparable to DIN in shaping, coordinating, and implementing the national standard on strategies and policies.[400] As a result, the role and function of NBS or NIST is limited in American standardization development.

Like DIN in Germany and BSI in the U.K., ANSI is the national standardization organization in the United States.[401] However, compare to DIN and BSI, ANSI itself was not a direct standard developer or standard enactor.[402] ANSI is forbidden to develop any standards by its charter, and is the only national standardization organization in the world that receives no regular and direct government support.[403] As a private, non-profit federation of

---

Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).

[397] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013).

[398] SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 88 (1997), DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013), Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 12 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016). *See also* JAMES F. SCHOOLEY, RESPONDING TO NATIONAL NEEDS: THE NATIONAL BUREAU OF STANDARDS BECOMES THE NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY 1969-1993 (2000).

[399] MURPHY, CRAIG N. & YATES, JOANNE , THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO): GLOBAL GOVERNANCE THROUGH VOLUNTARY CONSENSUS 11 (1st 2009), SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 88 (1997), DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013), Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 12 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016). *See also* JAMES F. SCHOOLEY, RESPONDING TO NATIONAL NEEDS: THE NATIONAL BUREAU OF STANDARDS BECOMES THE NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY 1969-1993 (2000).

[400] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013).

[401] ANDREW L. RUSSELL, OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS 60 (2014), Jay Tate, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE 442, 446-455, 463-468 (Peter A. Hall & David Soskice ed., 2001), CARL F. CARGILL, OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH 242-249 (1997), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 13-14 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[402] SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 101, ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 26 (1990), Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 14 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[403] Jay Tate, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE 442, 464 (Peter A. Hall & David Soskice ed., 2001).

standards organizations, ANSI has its role restricted to promote and facilitate voluntary consensus standards by accrediting the procedures of SSOs.[404] The ANSI's primary objective is to represent the interests of ANSI's nearly one thousand members, most of whom are private corporations, in international standardization bodies.[405] The accreditation that ANSI offers is merely optional for SSOs, ANSI therefore has a much more limited role and function than NIST in American standardization development.[406]

Besides NIST or ANSI, several American federal agencies issued *de jure* standards to coordinate, direct, or constrain private action.[407] A significant leap in these *de jure* standards occurred within the Progressive Era regulations.[408] These standards were typically restricted to health and safety issues, and to the prevention of market power abuse.[409] Examples of these *de jure* standards were: the Pure Food and Drug Act of 1906, Meat Inspection Act of 1906, and FTC Act of 1914.[410] These regulations embodied a new faith in applying professional research and scientific methods to address the social ills caused by rapid industrialization.[411]

Up until World War II, the American government's direct role in standardization was fairly restricted, acting merely in *de jure* standards and standard-setting labs as mentioned above.[412] The American government received a huge push to change its direct but limited role of the government once it entered World War II.[413] The threat from the Soviets during the Cold War pushed the American government to be far more activist.[414] The government

---

[404] U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 51 (1992), DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013). Accreditation by ANSI signifies the procedures meet the requirements of openness, balance, consensus, and due process. *Id.* at 33-34. *See also* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 101 (1997), ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 22, 26 (1990).

[405] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013), U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 51 (1992),

[406] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 33 (2013), Jay Tate, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE Institutional Foundations of Comparative Advantage 442, 464 (Peter A. Hall & David Soskice ed., 2001). In 1988, it was estimated by the NIST that only approximately 25 percent of all nongovernmental standards had been processed through the ANSI. U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE 53 (1992),

[407] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 12 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).

[408] *Id.*

[409] *Id.*, DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 34 (2013).

[410] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 12 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016), DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 34 (2013).

[411] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 12 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).

[412] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 34 (2013).

[413] *Id.*

[414] *Id.*

therefore had substantial investments in developing fundamental standards, such as programming languages, computer-aided design technologies, and the basic Internet standard TCP/IP.[415] Nonetheless, the deregulation wave during the Reagan administration eventually reversed this trend of an activist government, substantially limiting the government's role in standardization development.[416]

B. Indirect Role: Antitrust Regulation

Besides directly establishing standard-setting labs and *de jure* standards, the Federal Government shaped the American standardization system through indirect actions, which sometimes led to unintended consequences on American industry.[417] As mentioned, this part will merely focus on the impact of the government's antitrust regulation on the development of the standardization system. Even now, the pros and cons of aggressive versus passive antitrust regulation remains a fierce debate.[418] However, the government's antitrust regulation unquestionably played an influential role in creating and disseminating technical standards in the United States.[419]

The American antitrust policy indeed changed over time, and this change also significantly impacted the American standardization system.[420] As a whole, American antitrust regulations transformed from strong enforcement and suspicion of industrial organizations in the early twentieth century to loose prosecution and deference toward private market order in the late twentieth century.[421] Between the 1890s and the 1930s, an aggressive antitrust regulation deterred corporations from extensive growth through mergers and inter-firm collaboration.[422] The aggressive stance drove corporations to intensify their internal processes for research, development, and standardization.[423] Both AT&T and General Electric are examples of this phenomenon that established large industrial labs within corporations.[424]

---

[415] *Id.*
[416] *Id.*
[417] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 14 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).
[418] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 34 (2013).
[419] *Id.*
[420] *See id.* 34-35.
[421] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 14-15 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).
[422] *See* David A. Hounshell, *The Evolution of Industrial Research in the United States*, *in* ENGINES OF INNOVATION: U.S. INDUSTRIAL RESEARCH AT THE END OF AN ERA 13 (Richard S. Rosenbloom & William J. Spencer ed., 1996).
[423] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 15 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).
[424] *See* David A. Hounshell, *The Evolution of Industrial Research in the United States*, *in* ENGINES OF INNOVATION: U.S. INDUSTRIAL RESEARCH AT THE END OF AN ERA 13 (Richard S. Rosenbloom & William J. Spencer ed., 1996).

In the 1940s and 1950s when enforcing their antitrust policy, American antitrust agencies preferred to settle disputes through consent decrees than lawsuits.[425] Among the consent decrees, some even requested compulsory licenses from monopoly firms, which could have potentially changed the structure of American innovation and standardization systems.[426] In 1956, two consent decrees respectively ordered the compulsory licenses of AT&T's and IBM's patents, which made a huge range of basic semiconductor and telecommunication technology widely available for next to nothing to domestic and foreign firms.[427] These orders ironically flushed out technological advances developed within the large industrial labs mentioned above.[428] Small firms then gained access to advances, providing the seeds for competitive entrepreneurial innovation.[429] American antitrust regulators reduced an incumbents' capacity to control new technologies and markets by weakening protection for industrial innovation during the early twentieth century.[430] This relatively stringent post-war antitrust policy as a result aided the growth of new industries.[431] The policy was a powerful catalyst for the development of Silicon Valley's start-up companies.[432]

From the late 1960s to the early 1980s, the continuing stringent antitrust regulation also caused IBM to unbundle its hardware and software.[433] The change directly led to a predominance of technological "modularity" in the computer industry.[434] Computer systems could therefore be constructed from various components made by various corporations.[435] More importantly, the change also indirectly made interface standards and their establishers immeasurably more significant.[436] These types of collaborative networks or standard-setting groups became the most important feature of the standardization system in the United States.[437]

---

[425] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 15 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).

[426] *See* DAVID C. MOWERY & RICHARD R. NELSON, SOURCES OF INDUSTRIAL LEADERSHIP: STUDIES OF SEVEN INDUSTRIES 379-380 (1999), FREDERIC M. SCHERER, THE ECONOMIC EFFECTS OF COMPULSORY PATENT LICENSING (1977).

[427] *See* Peter C. Grindley & David J. Teece, *Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics*, *in* ESSAYS IN TECHNOLOGY MANAGEMENT AND POLICY: SELECTED PAPERS OF DAVID J. TEECE 204, 212-213 (David J. Teece ed., 2003), KEVIN G. WILSON, DEREGULATING TELECOMMUNICATIONS: U.S. AND CANADIAN TELECOMMUNICATIONS, 1840-1997 108-110 (2000).

[428] FREDERIC M. SCHERER, THE ECONOMIC EFFECTS OF COMPULSORY PATENT LICENSING (1977).

[429] *Id.*

[430] DAVID C. MOWERY & RICHARD R. NELSON, SOURCES OF INDUSTRIAL LEADERSHIP: STUDIES OF SEVEN INDUSTRIES 379-380 (1999).

[431] *Id.*, DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 35 (2013).

[432] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 35 (2013).

[433] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 15 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).

[434] *Id.*

[435] *Id.*

[436] *Id.*

[437] *Id.* at 15-16.

After the 1980s when SSOs became prominent, "restraint and inaction" became the centerpiece of American antitrust regulation as part of a radical shift during the administration of President Ronald Reagan.[438] The abandonment of prior strict antitrust policy was mainly caused by the rising influence of the Chicago School's thoughts on economic development and increasing intensity in global competition.[439] The proponents of deregulation considered severe antitrust enforcement as destructive arenas for industry-wide technical collaboration.[440] It was under this atmosphere for deregulation that the first legislation on standardization, NCRA, was passed in 1984. The legislation enacted later, such as NTTAA and SDOAA, were also based on similar ideas of a hands-off approach.[441]

American antitrust policy has transformed substantially throughout the twentieth century. The current though not yet finalized policy concerning standard-setting is intended to deregulate market behaviors and promote market competition.[442] These two prospects could further reduce policy imperfections made by incompetent bureaucracies perceived to stifle innovation.[443] Furthermore, government deregulation and market competition can be regarded as fundamental premises for the current American standardization system.[444] Nonetheless, these ideas are now experiencing pressure and challenges as the global Financial Crisis of 2007 again demonstrated the limits of deregulated financial markets.[445] Because of this, the government may be more willing to revisit the merits of more activist antitrust regulations.[446]

V. Case Study: CDMA 2000

In the United States, standard-setting participation for the private sector is optional, the creation of a standard does not necessarily guarantee its adoption by device manufacturers and service providers, or its diffusion in the marketplace.[447] The standard

---

[438] *Id.* at 16, ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 232-233 (1990), Andrew L. Russell, *Industrial Legislatures: The American System of Standardization*, *in* INTERNATIONAL STANDARDIZATION AS A STRATEGIC TOOL: COMMENDED PAPERS FROM THE IEC CENTENARY CHALLENGE 2006 70, 75-76 (Int'l Elec. Comm'n ed., 2006). *See also* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 306-308 (1998).The exceptions are safety standards. *See* SAMUEL KRISLOV, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS 129-131 (1997).

[439] Andrew L. Russell, *The American System: A Schumpeterian History of Standardization* 16 (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).

[440] *Id. See also* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 306 (1998), ROSS E. CHEIT, SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS 4 (1990).

[441] *See also* Roger B. Marks & Robert E. Hebner, *Government/Industry Interactions in the Global Standards System, in* THE STANDARDS EDGE: DYNAMIC TENSION 103 (Bolin, Sherrie ed., 2004), Carl Cargill, *The Role of Consortia Standards in Federal Government Procurements, in* THE STANDARDS EDGE 389 (Bolin, Sherrie ed., 2002).

[442] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 34 (2013).

[443] *Id.*

[444] *Id.*

[445] *Id.*

[446] *Id.* at 34-35.

[447] David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 573(2006).

may ultimately fail to address a significant need, or may need to compete with other standards emerging from substitute technology or those proposed by different institutions.[448] These competing standards and SSOs potentially create chaos and complexity to the U.S.'s standardization system.[449] However, once a standard emerges at the top in spite of severe competition, the subsequent network effects and costs switching may actually make the voluntary standard a *de facto* one.[450] This section will use the formation of the CDMA 2000 standard as a case study to illustrate the competition between different telecommunication technology standards proposed by different SSOs. The case study highlights that it was not only competition but also collaboration among different SSOs that contributed to the development of CDMA 2000 standard in the United States.

As one of the three global 3G standards, the CDMA 2000 standard found the U.S. as one of its major markets.[451] As opposed to the two other competing 3G standards, the CDMA 2000 standard was developed by the market and the private sector.[452] Based on the case study, the author observed how the private sector formulated the standards within voluntary SSOs and how the corporation used various strategies in the development process. The flexibility and diversity of the American standardization system helped overcome the transformations of a new 3G telecommunication industry. The following sections will discuss these issues respectively.

A. Background and Development

There are several so-called "generations" of telecommunication technology—first generation ("1G") was an analog service, second generation ("2G") was a digital service, third generation ("3G") refers to higher bandwidth packet switched networks, and the fourth generation ("4G") refers to upgrading 3G technology to provide more bandwidth and services offered.[453] Since 1983, the American telecommunication industry offered 1G telephonic services to corporate customers and consumers based on the Advanced Mobile Phone Services ("AMPS") standard developed by Bell Labs.[454] In the early 1990s, the industry then transitioned from 1G analog systems to 2G digital systems, because of 2G's

---

[448] *Id.*

[449] *See* DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIV (2013).

[450] David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 573-574 (2006). *See* Chapter Two for further discussion regarding voluntary and *de facto* standards.

[451] *See* Nir Kshetri, Prashant Palvia, & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 400 (2011).

[452] *See* Neil Gandal, David Salant, & Leonard Waverman, *Standards in Wireless Telephone Networks*, 27(5,6) TELECOMM. POL'Y 325, 326 (2003), DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 35 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[453] Neil Gandal, David Salant, & Leonard Waverman, *Standards in Wireless Telephone Networks*, 27(5,6) TELECOMM. POL'Y 325, 325 (2003). *See* Chapter Two for further discussion regarding the different generations of telecommunication technology.

[454] David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 571 (2006). *See also* JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 26-28 (2014).

efficient use of the radio spectrum and increasing market demand for wireless telephony.[455] Unlike the European Community ("EC") that mandated a harmonized standard set by ETSI, the United States allowed the market to determine 2G standards.[456] American operators were free to choose among four recognized telecommunication standards: Code Division Multiple Access ("CDMA") or IS-95, Global System for Mobile Communication ("GSM"), Time Division Multiple Access ("TDMA"), and Integrated Dispatch Enhanced Network ("iDEN").[457]

B. Telecommunication Standards Development Model

In the American telecommunication industry, the 2G standards mentioned above did not directly evolve into the 3G CDMA 2000 standard.[458] Instead, the telecommunication technology had a period of transition from 2G to 2.5G, and then from 2.5G to 3G.[459] The intermediate 2.5G technology refers to upgrading the 2G network to permit near 3G data rates.[460] The sections below will discuss how the four competing 2G standards evolved into the IS-95 A standard during the 2.5G era, and ultimately developed into the CDMA 2000 standard during the 3G era.

1. General Model

Hemphill proposed a general model as seen in Figure 3-2 on the development of 2G, 2.5G, and 3G standards in the United States.[461] The model is an essentially linear process of phases under different environmental influences.[462] Although these three generations share the same general model, they contain some variance to the extent environmental influences affect specific phases of the model.[463]

---

[455] David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 571 (2006). *See also* JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 26-28 (2014).

[456] Neil Gandal, David Salant, & Leonard Waverman, *Standards in Wireless Telephone Networks*, 27(5,6) TELECOMM. POL'Y 325, 325-326 (2003).

[457] *Id.* at 325. *See also* JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 14, 27 (2014).

[458] *See* JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 27 (2014), Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 103-104 (2009).

[459] *See* JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 27 (2014), Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 103-104 (2009).

[460] Neil Gandal, David Salant, & Leonard Waverman, *Standards in Wireless Telephone Networks*, 27(5,6) TELECOMM. POL'Y 325, 325 (2003).

[461] Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 117 (2009).

[462] *Id.*

[463] *Id.*

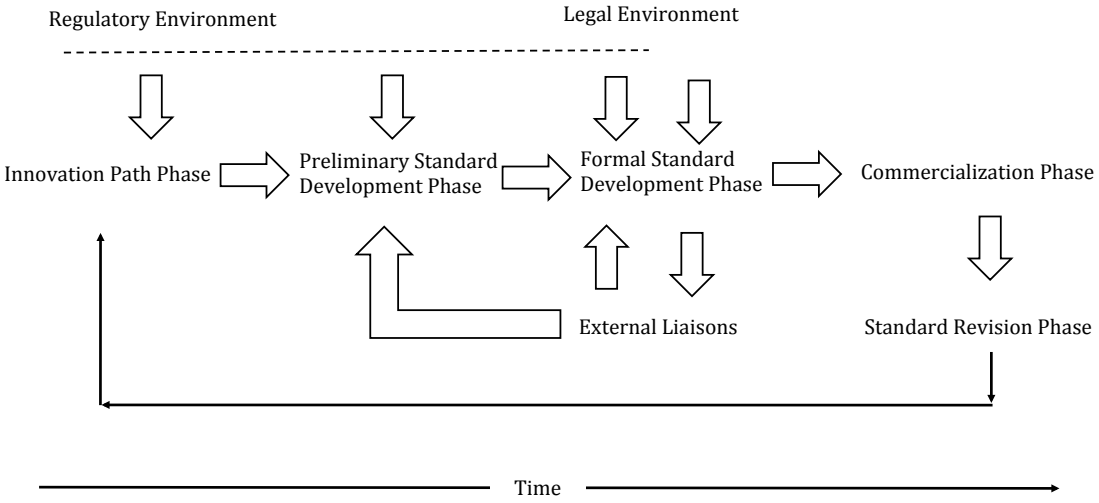


Figure 3-2: General Development Model for 2G, 2.5G, 3G technology and standards
Source: Thomas Hemphill, p.118

The model consists of the following five phases in a linear process, as well as three environmental influences:[464]

- **Innovation Path Phase:** consisted of research and development activities relevant to the at-issue technology, existing *de facto* standards, and revisions from the Standard Revision Phase.
- **Preliminary Standard Development Phase:** included customer probation and its consequent technical review, as well as corporate proposals of standards.
- **Formal Standard Development Phase:** developed a new standard through voting and final ballot acceptance.
- **Commercialization Phase:** implemented the accepted standard in design and manufacture, and then distributed in the product in the market.
- **Standard Revision Phase:** included upgraded versions and enhanced capabilities of original technology standards, which helps technology develop to meet new customer requirements.
- **Regulatory Environment:** included federal agencies that influenced the above Innovation Path, Preliminary Standard Development, and Formal Standard Development Phases. e.g. the FCC.
- **Legal Environment:** included relevant IP and antitrust regulations that influenced the above Formal Standard Development and Commercialization Phases.
- **External Liaisons:** consisted of a two-way, mutually interactive relationship between SSOs, as well as a one-way, information providing relationship between SSOs and government agencies.

2. Development from 2G to 2.5G

The formal standardization process on the evolution from 2G to 2.5G technology began in March 1992, and was eventually completed in July 1993.[465] The process took

[464] *Id.* at 117-118.

approximately 16 months before it was ultimately published as the official IS-95 A standard.[466] Table 3-4 below depicts the development process for IS-95 A standard in light of the above innovation path, preliminary standard development, formal standard development, commercialization, standard revision phases as seen in the general model.

[465] *Id.* at 114.
[466] *Id.*

Table 3-4: The Chronological Development Process of IS-95 A

Item	Time	Descriptions or Events
Innovation Path Phase	Prior to 1989	There were some competing technologies based on different 2G standards- CDMA, GSM, TDMA, and iDEN.
Preliminary Standard Development Phase	1989	• Qualcomm came to the Cellular Technology Industry Association ("CTIA") and proposed a new CDMA-based technology. • Some firms also started being concerned about the capacity improvements and quality of TDMA technology
	1989-1992.2	• CTIA sponsored several forums to debate the merits of different technologies, including TDMA and CDMA. • Qualcomm conducted joint testing with some carriers, Pactel, Ameritech, and NYNEX • Motorola and Lucent began working with Qualcomm.
	1992.2	The CTIA Board of Directors decided to support standardization of CDMA, and subsequently EIA and TIA began to form the TR45.5 Subcommittee within TIA.
Formal Standard Development Phase	1992.3	• The TIA established the TR45.5 Wideband Spread Spectrum Digital Technologies Standards Subcommittee, in charge of creating American telecommunication standards, which formed the basis of the U.S.'s position in international standardization bodies. • Three working groups ('WGs") were then established within TR45.5 to address the development of a CDMA-based telecommunication standard.
	1992.3	Qualcomm's proposed CDMA technology was questioned on its violation of the International Traffic in Arms Regulation ("ITAR").
	1992.5	After consultation with the Department of Defense, the TR45.5 Subcommittee chair decided the ITAR issue in favor of Qualcomm, accepting Qualcomm's CDMA technology as a potential contribution to technology systems.
	1992.8	• During the TR 45.5 Subcommittee meeting, the members were reminded repeatedly to focus on discussing technical deliberations, rather than IP. • The members were then notified that the relevant IP issues would later be addressed in the TIA Style Manual.
	1993.3	InterDigital, a primary owner of TDMA technology usurped the ongoing standard-setting process, notifying TIA that it would not grant licenses under free or reasonable royalty for its equipment to comply with the proposed IS-95 A standard and that it would instead file at least one patent infringement lawsuit.
	1993.6	After a Default Ballot, a consensus was reached on the IS-95 A standard.
	1993.7	TIA announced that it would publish the IS-95 A standard with cautionary language obliquely referencing InterDigital's patent position and its legal implications for manufacturers adopting the standard.
Commercialization Phase	1993.7~	After TIA published the standard, firms manufactured equipment and systems compliant with the standard in North America.
	1993.9	• Qualcomm announced that it had reached an agreement with InterDigital, stating that they did not argue as to whether the equipment compliant with the IS-95 A standard had actually infringed InterDigital's at-issue patents. • The patent infringement issue arising from InterDigital's position delayed the ballot process by 3 months, and placed the standard's commercialization in jeopardy for up to 6 months.
Standard Revision Phase	1993.9~	Standard revisions were developed because of the information received regarding new customer requirements, as well as enhancements in telecommunication technology capabilities.

Source: Thomas Hemphill, p.112-115

In terms of the environmental influence, the regulatory environment only had an indirect impact on the development of the IS-95 A standard.[467] In 1988, the FCC removed itself from active involvement in developing telecommunication standards. Instead, the FCC shifted its focus to allocating spectrum in 1988.[468] The spectrum influenced how parameters were set for the telecommunication technology to operate. The FCC's allocation only has an indirect effect in the Innovation Path Phase of the general process.[469] The Legal Environment, particularly the patent infringement issue, directly affected the Formal Standard Development Phase, and to a lesser extent, the Commercialization Phase of the process.[470] Finally, the External Liaisons were a two-way, mutually interactive relationship between TIA and CTIA in the Formal Standard Development Phase, as well as a one-way CTIA to TIA relationship in the Preliminary Standard Development Phase.[471]

As 2.5G evolved, Qualcomm recognized that the significance of establishing de facto technology leadership was important prior to the initiation of the Formal Standard Development Phase.[472] However, in the beginning of the Preliminary Standard Development Phase, the CTIA did not choose to develop a single telecommunication standard.[473] This was not only because telecommunication manufacturers were unable to find a compropise among different technology, but also because there was large uncertainty in CDMA-based technology proposed by Qualcomm.[474] Given the situation, Qualcomm had been lobbying the telecommunication industry since 1989 with proposals to use its CDMA-based technology.[475] Qualcomm took the following approaches to overcome concerns and challenges traditionally associated with CDMA technology:[476]

- Qualcomm addressed these concerns in several CTIA-sponsored forums where debate over the merits of different technologies.
- Qualcomm entered into a joint testing arrangement with carriers Pactel, Ameritech, and NYNEX in order to gather support for its patented CDMA technology.
- Qualcomm entered into a cooperative working relationship with Motorola and Lucent, both of whom had lost in the earlier competition for the 2G market.

Because of these strategic cooperative decisions, the CTIA Board of Directors decided to support standardization of Qualcomm's proposed CDMA technology, completing the Preliminary Standards Development Phase.[477] Afterwards, Qualcomm's technology contribution emerged as the dominant design in the Formal Standards Development

---

[467] *Id.* at 112.
[468] *Id.*
[469] *Id.* at 112, 114.
[470] *Id.* at 114, 115.
[471] *Id.* at 115.
[472] *Id.* at 120.
[473] JEFFREY L. FUNK, GLOBAL COMPETITION BETWEEN AND WITHIN STANDARDS: THE CASE OF MOBILE PHONES, 74 (2001).
[474] *Id.*
[475] *Id.*
[476] Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 113, 120 (2009).
[477] *Id.*

Phase.[478] Qualcomm then has licensed its CDMA technology to many telecommunication manufacturers, assisting them to develop and deploy CDMA-based products.[479]

As seen in the development process where competing technologies vied for the dominant design in the Preliminary Standards Development Phase, it was imperative that a competing firm made such concerted and planned effort to position itself as a leader prior to entering the Formal Standards Development Phase.[480] The firm's efforts and leadership can bring a pre-conceived momentum for newly proposed technology, helping the industry perceive the firm's proposed standard as a truly viable contribution in the formal process.[481] In addition, once technical concerns emerge in the industry, a competing firm is obligated to actively participate in public industry forums to address and assuage these concerns.[482] Active participation was a strategic imperative that allowed SSOs to directly impact the standard-setting process.[483] For instance, in the case of 2.5 G development, CTIA voted to support CDMA technology, encouraging TIA to consider the technology as a viable technical contribution.[484] Strategic technology alliances among manufacturers or carriers must start prior to the initiation of the Formal Standards Development Phase.[485] The strategic alliances could help control what the subcommittee sets as its agenda in the Formal Standards Development Phase, which is beneficial in protecting the technologies they support.[486]

3. Development from 2.5G to 3G

The formal standardization process for the development from 2.5G to 3G began in November 1998, and was eventually published in March 2000.[487] The process took approximately 16 months to publish the official CMDA 2000 standard, which was similar to the evolution of 2G to 2.5G.[488] Table 3-5 below describes the chronological development of the CDMA 2000 process based on the general development model.

---

[478] *Id.*
[479] *Id. See also* JEFFREY L. FUNK, GLOBAL COMPETITION BETWEEN AND WITHIN STANDARDS: THE CASE OF MOBILE PHONES, 75 (2001).
[480] Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 113, 120 (2009).
[481] *Id.*
[482] *Id.* at 120-121.
[483] *Id.* at 120.
[484] *Id.* at 121.
[485] *Id.*
[486] *See id.*
[487] *Id.* at 116.
[488] *Id.*

Table 3-5: The Chronological Development of CDMA 2000

Item	Time	Descriptions or Events
Innovation Path Phase	Prior to 1998.1	Prior to developing the CDMA 2000 standard, 3G technology had been established *de facto* in the Wideband Code Division Multiple Access ("WCDMA") standard, a standard which was upgraded from the 2G GSM standard and later adopted by the EC.
		As with other competing 3G technology standards, the CDMA 2000 standard included patented technology from Qualcomm, Nokia, Hitachi, HNS, Lucent, Motorola, Nortel, and Samsung.
Preliminary Standard Development Phase	1998.1	Qualcomm, Nokia, Hitachi, HNS, Lucent, Motorola, Nortel, and Samsung introduced proposals to evolve 2.5 to 3G technology in the TR45.5 Subcommittee within TIA.
	1998.2	In the TR45.5 Subcommittee meeting, an ad hoc group was established to take an active role in coordinating and harmonizing worldwide CDMA standards.
	1998.10	In the TR45.5 Subcommittee meeting, a CDMA 2000 Schedule Development Team was established as a forum to address technical interdependencies and schedule issues.
Formal Standard Development Phase	1998.11	The TR45.5 chair gave a presentation on the 3G Partnership Project 2 ("3GPP2").
	1998.11	• Replacing the previous CDMA 2000 Schedule Development Team, a Project Management Team was established in the TR45.5 Subcommittee to monitor and manage TR45.5 development activities. • Four WGs were then formed within TR45.5 to address the development of a CDMA-based telecommunication standard.
	1998.12	• In the TR45.5 Subcommittee meeting, the Verification and Validation Group chair indicated that if the baseline text for CDMA 2000 Phase I was available by January 1999, then the ballot text would be available by the end of the first quarter in 1999. • The Ad Hoc Group announced that the International Telecommunication Union ("ITU") would consider harmonizing all received 3G proposals. • In a joint meeting, TIA and the Association of Radio Industries and Businesses ("ARIB") reached a consensus on the status report to be distributed at the January 1999 TR45.5 Subcommittee meeting.
	1999.1	In the TR45.5 Subcommittee meeting, the CDMA 2000 Phase I standard was first updated.
	1999.2	• In the TR45.5 Subcommittee meeting, recommendations were presented regarding the CDMA 2000 Phase II development plan, as well as the release schedule for the U.S.-based CDMA Development Group ("CDG") and Japan-based Telecommunications Technology Committee ("TTC"). • Four TR45.5 WGs had rapid standard development activities, because the participants in the WGs focused on making their proposals available for consideration by the ITU.
	1999.3	In the TR45.5 Subcommittee meeting, the Verification and Validation Group chair recommended that CDMA 2000 Phase I be adopted for a 30-day ballot.
	1999.5	The ballot comment review phase began.
	1999.7	In the TR45.5 Subcommittee meeting, all ballot comments for CDMA 2000 Phase I were resolved.
	1999.12	In the TR45.5 Subcommittee meeting, a revised and updated CDMA 2000 Phase II received the approval of members for a 45-day TIA ballot.
	2000.2	The ballot results of CDMA 2000 Phase II were reported to TR45.5 members, and the results revealed that it had reached consensus on all ballots.
	2000.3	The CDMA 2000 standard was officially published.
Commerciali zation Phase	2000.3~	Firms manufactured equipment and systems in North America.
Standard	2001.8,	Standard revisions on the CDMA 2000 standard were published based on

Revision Phase	2002.4	information received regarding new customer requirements and enhancements in technology capabilities.

Source: Thomas Hemphill, p.115-117

As with the transition to 2.5G, the CDMA 2000 standard was indirectly influenced by the Regulatory Environment in the Innovation Path Phase of the development process because the FCC shifted its focus on only spectrum allocation after 1988.[489] However, the difference in the transition to 3G was in the Legal Environment, specifically contentious patent infringement issues. These patent infringement issues did not significantly impact the Formal Standard Development or Commercialization Phases.[490] The External Liaisons were only a two-way, mutually interactive relationship between TIA and ARIB, 3GPP2, CDG, TTG while the CDMA 2000 standard was still developing.[491] Moreover, when 3GPP2 became active in standard-setting activities, TIA no longer had meetings regarding standardization, and instead merely approved the technological specifications created by 3GPP2.[492]

C. Evaluation of Standardization

1. Role of the Government

The CDMA 2000 standard was developed in the classical and traditional American standardization system, which is bottom-up and market-driven.[493] Under decentralized governance, the government had a fairly limited role and authority in developing the CDMA 2000 standard.[494] Instead, voluntary SSOs and private corporations played a leading role in forming the standard.

As far back as the development of 2G standards, the voluntary standardization system has been utilized in the United States.[495] In the late 1980s, the FCC removed itself from direct participation in the telecommunication standard development process.[496] It shifted its focus to spectrum allocation, which only had an indirect impact on standard-setting.[497] On the other hand, EIA or TIA managed the standard development process in the United States when the 2G standard started to develop in around 1988.[498] Either EIA or TIA

[489] *Id.* at 112, 114, 115, 117.
[490] *Id.* at 117.
[491] *Id.*
[492] *See* David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 578 (2006).
[493] *See* Andrew L. Russell, *Industrial Legislatures: The American System of Standardization*, *in* INTERNATIONAL STANDARDIZATION AS A STRATEGIC TOOL: COMMENDED PAPERS FROM THE IEC CENTENARY CHALLENGE 2006 70, 70-71 (Int'l Elec. Comm'n ed., 2006), DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIV, XIII, 49 (2013).
[494] *See* DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIV (2013). *See also* Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).
[495] *See* Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 110 (2009).
[496] *Id.*
[497] *Id. See also* David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 577 (2006).
[498] Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 110-111 (2009).

continued to play a similar role in the evolution of the 2.5G and 3G standards. The FCC continued to play an indirect role in establishing technology standards.[499]

As a result, the development of telecommunication standards was exclusively in the hands of the private sector and SSOs.[500] Moreover, standardization in the telecommunication industry began moving away from hierarchically-controlled settings and forums.[501] Equipment manufacturers and network operators instead have created flexible industry consortia as alternative standardization forums.[502] The organizational-level representation in consortia can directly pursue commercial interests as well as expedite the coordination and adoption of specific technology innovation.[503]

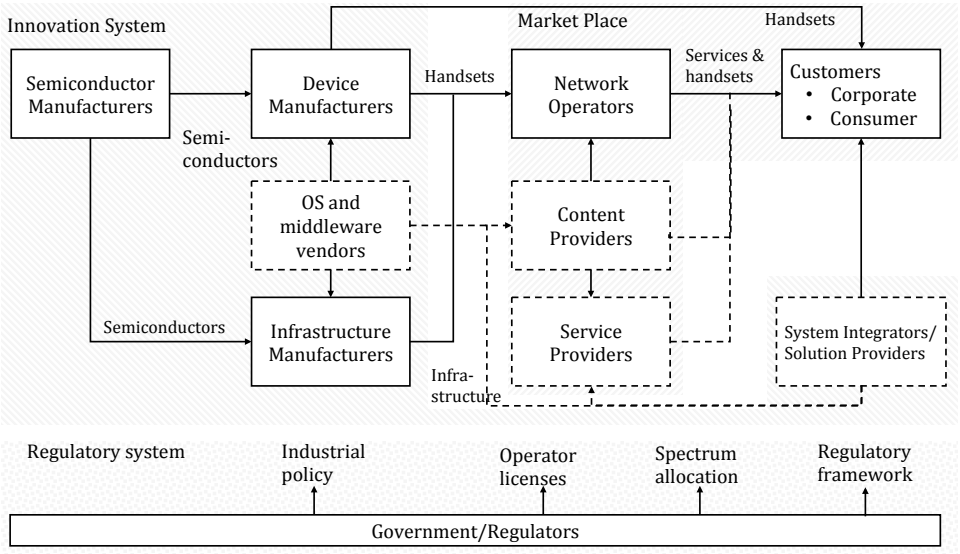
2. The Role of Private Sector

The evolution from 2G to 3G technology was more than a simple technology upgrade.[504] Because 3G services moved beyond telephony and converged with the computing and content sectors, the transition to 3G was a major economic transformation requiring a major reconfiguration of existing industry networks.[505] In the original 2G industry network, its primary participants consisted of only government regulators, network operators, and manufacturers of infrastructure, device, and semiconductors.[506] In the latter half of the 1990s where technology evolved to 3G, the Internet became so popular that it sparked the interest of operators and manufacturers in telecommunication data services.[507]

3G technology's capability and subsequent new business models brought many new participants into the telecommunication industry, particularly participants from the computing and content industries.[508] Figure 3-6 illustrates the industry participants in 2G, 2.5G, and 3G services.

---

[499] *Id.* at 112, 115. *See also* David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 577 (2006).
[500] *See* Thomas A. Hemphill, *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103, 117-118 (2009).
[501] David Tilson & Kalle Lyytinen, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569, 573 (2006).
[502] *Id.* at 573.
[503] *Id.*
[504] *Id.* at 569.
[505] *Id.*
[506] *Id.* at 571.
[507] *Id.* at 572.
[508] *Id.* at 576.



(Note: The dashed boxes shows new industry participants associated with 2.5G and 3G services)

Figure 3-3: Industry Participants in 2G, 2.5G and 3G services
Source: David Tilson, Kalle Lyytinen, p.572

Data services in 3G technology increased the complexity of telecommunication systems and introduced many inter-related components into infrastructures and devices.[509] The range of interfaces and standardization therefore had moved beyond air interface and signaling protocols to incorporate specifications higher in the stack, including data representation and transmission, application platforms, and user interfaces.[510] Given this transformation, the range of interfaces and standardization in 3G telecommunication industry expanded to include those previously under the exclusive province of the computing and content industries.[511] As the range both widened and deepened, the complexity of the standardization arena also increased as a result.[512]

The advent of 3G technology and its data services complicated the development of standardization.[513] While the range of interfaces and standardization grew at a breathtaking pace, the overall number of SSOs also increased dramatically.[514] There were ultimately over 100 various SSOs in the 3G telecommunication industry, and participants were from the computing, content, and data networking industries.[515] In addition to the traditional SSOs (e.g. CTIA, TIA, TTC, ARIB), there were new operator and vendor-driven industry consortia (e.g. 3GPP2) as well as forums that crossed the wireless and computing domains (e.g. IEEE, IETF and W3C).[516] Moreover, the primary forum for 3G standardization moved to the

[509] *Id.* at 577.
[510] *Id.*
[511] *See id.* at 582.
[512] *See id.*
[513] *Id.* at 578.
[514] *Id.* at 569.
[515] *Id.* at 578. Because of the increase in numbers, even the biggest players in the industry could only attend around half of the SSOs. Some firms had to collaborate with their partners so that they could monitor forums they could not attend. *Id.*
[516] *Id.*

industry consortia, and formal SSOs held few meetings regarding standard development.[517] In the transition to 3G, nimble industry consortia took over the primary responsibilities for standardization; meanwhile, the role and importance of the traditional SSO and government had diminished.[518]

It was the data services in 3G technology that caused the traditional telecommunication industry to converge with computing and content industries. This convergence not only upgraded technology, but also complicated the industry value network. As seen in the case of the CDMA 2000 standard, it was the flexibility of the American voluntary standardization system that helped the domestic industry adopt the radical changes in telecommunication technology. The United States has a long history and mature mechanism for its voluntary standardization system. This bottom-up and decentralized system is of great value to adapt to new changes in technology and industry.

VI. Conclusion

This chapter systematically discusses the American standardization system. The discussion starts with an overview of global standardization history, and then shifts to the standardization history in the United States. The chapter then reviews relevant legislation, the government's role, and current SSO development in the United States. The final part offers a case study of the CDMA 2000 standard to illustrate the flexibility arising from the American standardization system.

The United States has a different standardization system compared to other nations in the world. The American government takes a limited role in the standard-setting process. Instead, the private sector replaces the government in leading standardization development in the United States. The private sector forms a variety of SSOs, which function as "industrial legislature" to regulate the market and its players. This self-regulation model began as early as the colonial era in American history during a time when mistrust of the government was deeply rooted in American society. Standard-setting activities were initiated in industrial associations and then moved to standard-setting committees composed of engineering societies and trade associations. This decentralized governance afforded open access and equal opportunity to the private sector. The standards were developed under the principles of consensus, openness, transparency, due process, and balance of interests. More recently, industry consortia has become the prominent standardization form in the ICT industry in the United States.

The United States also established relevant legislation to support the legitimacy and development of voluntary SSOs, as well as to facilitate the increase and dissemination of voluntary standards.[519] Given the mature mechanism of voluntary standardization system, the American government has limited involvement in standardization development. The government merely has a direct role in setting *de jure* standards and establishing standardization labs. As for the others, the government merely indirectly impacts standardization development through antitrust and IP regulation.

---

[517] *See Id.*
[518] *Id.* at 569, 581.
[519] *See, e.g.*, the National Cooperative Research Act of 1984, National Technology Transfer and Advancement Act of 1995, Standards Development Organization Advancement Act of 2004.

Nowadays, voluntary SSOs take the leading role in developing standards. Over 600 voluntary SSOs with various participants have existed in the United States. The SSOs consist of professional societies, trade associations, formal SSOs, and industry consortia. Given its lengthy history in a market-driven and bottom-up standardization model, the U.S. has enjoyed a prosperous atmosphere for standard-setting activities in the current market. Although the current voluntary system may retain competing standards and SSOs, the competition only helps the final results, creating standards that are more acceptable to the market and consumers.

The American voluntary standardization system also crates flexibility and nimbleness in the market, which significantly helps adapt to the uncertainty of a new industry or changing technology. The final section in this chapter offered a case study of the CDMA 2000 standard in 3G telecommunication technology. The standard was developed in SSOs by the private sector. While messy due to competition, the bottom-up and market-led standardization system helped the American domestic industry adapt to new changes in the industrial value network.

In contrast to the highly-decentralized United States system, the next chapter will discuss highly centralized standardization system in China. Chapter 4 discusses how the Chinese government used its state power to direct standardization development in a systemic way. Chapters 3 and 4 provide an overview of the contrasting landscapes of two of the biggest economies in the world.

Chapter 4 Standardization in China

As Chapter 3 discussed the United States' system of standardization, Chapter 4 will focus on analyzing China's standardization system. This chapter provides an overview of relevant standardization history, legislation, and the role of the government in China. The chapter then discusses ongoing reforms in China's standardization system. The last section in the chapter uses 3G telecommunication standards as a case study for how the Time Division-Synchronous Code Division Multiple Access ("TD-SCDMA") standard was developed in China.

I. Chinese Standardization History

China is a nation that boasts of centuries of legacy and tradition. In its 5000-year history, China achieved some outstanding developments in standardization.[520] However, most of these developments in standardization focused on the traditional technology field, such as measurement methods, transportation and logistics, minting coins, and printing technology.[521] After the Industrial Revolution, standardization and its related activities became an important issue in the West. China on the other hand, still under the rule of the Qing Dynasty during the 19th century, began to decline. Some of its territories were gradually colonized by predominantly Western nations.[522] After the fall of the Qing Empire, China experienced civil war during the first half of the 20th century.[523] Under these

---

[520] Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 6, Gu Mengjie (顾孟洁), *Zhongguo Biaozhunhua Fazhanshi Xintan* (中国标准化发展史新探) [*Discussion on the Development History of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.3, 2001, at 7, 7. *See also* Wu Nengfu (吴能夫), *Zhongguo Biaozhunhua de Lishi Yuanyuan* (中国标准化的历史渊源) [History of Chinese Standardization], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.5, 2002, at 52, 58-60.

[521] Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 6-7. *See also* Wu Nengfu (吴能夫), *Zhongguo Biaozhunhua de Lishi Yuanyuan* (中国标准化的历史渊源) [History of Chinese Standardization], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.5, 2002, at 52, 58-60.

[522] *See* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 7, Gu Mengjie (顾孟洁), *Zhongguo Biaozhunhua Fazhanshi Xintan* (中国标准化发展史新探) [*Discussion on the Development History of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.3, 2001, at 7, 7.

[523] *See* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 7, Gu Mengjie (顾孟洁), *Zhongguo Biaozhunhua Fazhanshi Xintan* (中国标准化发展史新探) [*Discussion on the Development History of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.3, 2001, at 7, 8.

circumstances, China's developments in standardization remained fairly stagnant.[524] It was not until the establishment of the People's Republic of China ("PRC") in 1949 did China commence its progressive movement in standardization policies and activities.[525] This study examines China's standardization policies post-1949.

China's history of standardization may be separated into two periods: (1) from 1949 to the mid-1980s, and (2) from the mid-1980s to the present.[526] The first period occurred after the PRC government was established, but just before the government started to transform its system into a planned economy.[527] During this time, the Chinese standardization system followed the Soviet Union and Eastern European country models.[528] The PRC government established, administered, and enforced standards.[529] The second period of standardization in China commenced when the PRC government began transforming its planned economy to a socialist market economy with Chinese characteristics.[530] China then joined the World

---

[524] *See* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 7

[525] *See id.* at 8, Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22, Gu Mengjie (顾孟洁), *Zhongguo Biaozhunhua Fazhanshi Xintan* (中国标准化发展史新探) [*Discussion on the Development History of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.3, 2001, at 7, 8-9, Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 5.

[526] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[527] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[528] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[529] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[530] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future*

Trade Organization ("WTO") in 2001. China did not change much during its fundamental period of standardization, although it attempted to make some changes during this transformational period.[531] Besides the two general periods mentioned above, there are several sub-periods that occurred within each period. Table 4-1 summarizes the periods and their associated sub-periods in China's standardization history as of 1949.

Table 4-1: Overview of Chinese Standardization History

Phase	Period	Characteristics	Sub-period	Main Content
1	1949–Mid-1980s	Compulsory standards in a planned economy	1949-1966	Formed a standardization administration system
			1966-1976	Suspended standardization development during the Cultural Revolution
			1976-mid 1980s	Modernized, internationalized, and reorganized government structure
2	Mid-1980s-Present	Compulsory and voluntary standards in a transforming economy	mid 1980s-early 2000	Passed *Standardization Law*, prepared to join the WTO
			early 2000-present	Formulating a national standardization strategy

Source: Compiled by the author

China's near 70-years-old standards system has several distinguishing features. In its pre-1980s standards system, standards were compulsory and functioned as mandatory technical regulations under central planning for all economic developments.[532] These compulsory standards were established to increase production, increase efficiency, and protect public health and safety.[533] In its post-1988 *Standardization Law* system, China had

---

of Chinese Standardization], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[531] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[532] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9, Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

[533] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9, Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

both compulsory and voluntary standards in its standards system.[534] The compulsory standards continued to function as mandatory technical regulations, where public or government interests overrode market or private interests. In contrast, voluntary standards formed when private parties saw the benefits. When China joined the WTO in the early 2000s, its membership signalized the nation's efforts to harmonize the Chinese standards system with the global standards system dominated by the West.[535] In the post-WTO era, China continued to harmonize its voluntary standards with the Western-dominated global standards system. However, as for its compulsory standards, China proposed a standardization policy that bore "Chinese characteristics." China aimed to strengthen its national policies to resist Western dominance, forcing the West to recognize China as an economic and political equal in terms of global economic and political systems, including standards system.

The following section discusses in detail each of these sub-periods in Table 4-1.

A. Phase 1: 1949-Mid-1980s: Compulsory Standards in Planned Economy

During this period, the Chinese economic system was a centrally-planned economy.[536] The PRC central government controlled and regulated production, distribution, and prices.[537] The central government also established and enforced standards.[538] When the

---

[534] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23, Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 6.

[535] *See* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 7-8, Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 24.

[536] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[537] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[538] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

government issued these standards, these standards then became technical regulations.[539] These standards were therefore compulsory, and the government and enterprises were required to comply.[540]

1. 1949-1966: Forming a Standardization Administration System

The first period of this stage of standardization development was from 1949 to 1966, which began after the establishment of the PRC government and ended before the Cultural Revolution.[541] After its state of disarray in the 19th century, China sought to rebuild its economy. After the new PRC was established, the government commenced standardization development.[542] In its *First Five-year Plan*, the PRC government regarded the standardization development as an important technical policy in its economic development.[543] The Plan instructed departments to establish standards for design, and requested that competent authorities in the central government establish product standards.[544] Since then, the government has emphasized organizing standardization activities and establishing standardization regulations and institutions.[545]

Influenced by the Soviet Union's model of a planned economy, the Chinese standardization system during this period bore the following primary characteristics: "centralized leadership and administration, governing by administration orders, and compulsory effects for whole standards."[546] With these characteristics of centralization, the PRC government formed a preliminary model for future standard administration systems.[547] The model constructed allowed the central government to lead standardization administration, competent authorities under State Council and local governments to take charge of standardization activities, and research institutes to establish standards.[548] Under

---

[539] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[540] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[541] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

[542] Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 5.

[543] *Id.*

[544] *Id.*

[545] *Id.*

[546] *Id.*

[547] *Id.* at 6.

[548] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

the planned economy, the central government monopolized the purchasing and marketing of private enterprises' products.[549] Relevant industrial authorities in State Council bore semblances to large state-owned enterprises.[550] It was therefore mandatory to follow all levels and types of standards, including national standards, ministerial standards, local standards, and enterprise standards at the time.[551]

2. 1966-1976: Suspending Standardization Development

China experienced internal turmoil during the Cultural Revolution, from 1966 to 1976.[552] During this time period, the PRC government shut down, which negatively impacted China's nascent economy.[553] Due to a dysfunctional government, China's standardization development ceased to progress during this period.[554] For example, Figure 4-1 indicates the number of issued national standards. From 1966 to 1976, only 400 national standards were issued by the central government; on average, only 40 were issued per year.[555] After the Cultural Revolution though, the number of standards issued increased radically each year.

---

[549] Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 5.

[550] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

[551] *Id.*, Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 5.

[552] Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 6.

[553] *See id*., Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

[554] *See* Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22, Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 6, Gu Mengjie (顾孟洁), *Zhongguo Biaozhunhua Fazhanshi Xintan* (中国标准化发展史新探) [*Discussion on the Development History of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.3, 2001, at 7, 9, Wang Zhongmin (王忠敏), *Lun Zhongguo Biaozhunhua Guanli San Jieduan* (论中国标准化管理三阶段) [*Discussing the Three Phases of Chinese Standardization Administration*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.4, 2004, at 9, 10.

[555] Gu Mengjie (顾孟洁), *Zhongguo Biaozhunhua Fazhanshi Xintan* (中国标准化发展史新探) [*Discussion on the Development History of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.3, 2001, at 7, 9-10, Wang Zhongmin (王忠敏), *Lun Zhongguo*

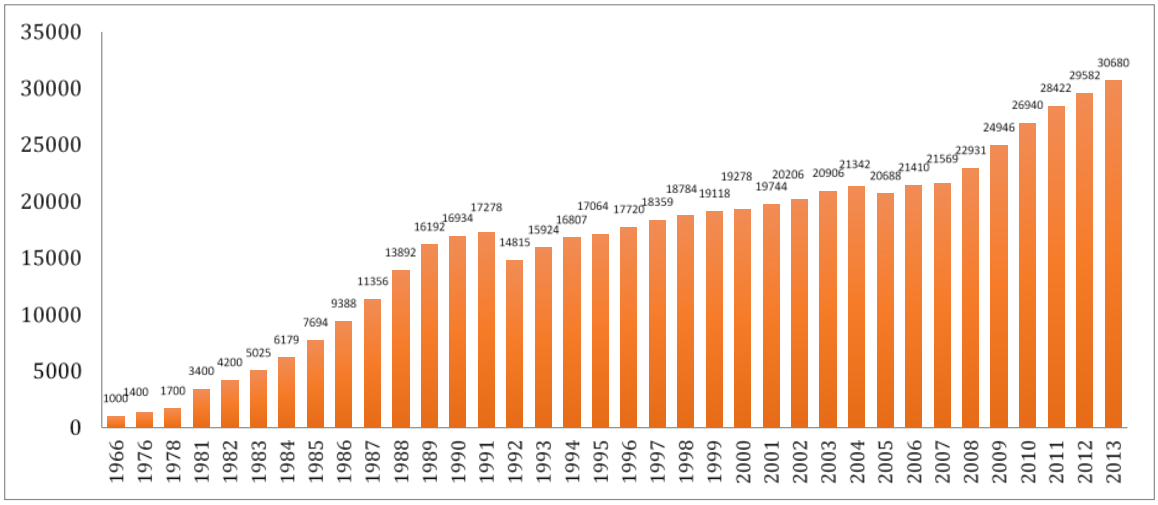


Figure 4-1: The Cumulative Amount of Chinese National Standards (1966~2013)
Source: Gu Mengjie, p.10, China National Institute of Standardization ("CNIS"), p.33 (2014)

3. 1976-Mid-1980s: Modernization, Internationalization, Government Reorganization

After the Cultural Revolution, the PRC government restarted its economic development with a focus on modernization and internationalization.[556] Standardization development during this time period progressed significantly.

- First, the State General Bureau of Standardization ("SGBS") and China Association for Standardization ("CAS"), two important Chinese standardization institutions, were both established in 1978.[557] The SGBS was the predecessor of the Standard Administration of China ("SAC").[558]

Biaozhunhua Guanli San Jieduan (论中国标准化管理三阶段) [*Discussing the Three Phases of Chinese Standardization Administration*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.4, 2004, at 9, 10.

[556] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

[557] *Id.*, WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 24 (2010), Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 4, CHINA ASS'N FOR STANDARDIZATION, ABOUT CAS, *available at* http://www.china-cas.org/xhjj.jhtml (last visit date: Feb. 28, 2016).

[558] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 24 (2010).

- Second, China increased its interactions with developed countries and participation in international organizations within the standardization field.[559] During the 1980s, China signed cooperation agreements with many national standardization organizations in Germany, France, U.S..[560] Influenced by these countries and their organizations, in 1979, China started to form Technical Committees ("TCs") for standardization in different technological fields.[561] Forty-four (44) TCs had been formed by the end of 1984.[562] Even now, TCs remain the primary institutions that establish or revise technology standards in China.[563]

Despite its reform and open policy, China at the time still possessed strong characteristics of a planned economy.[564] During its government reorganization in 1982, China improved and solidified its centralized standardization system, where the central government led the standardization development and the competent authorities and local governments took on individual responsibilities.[565] China established Departments of Standards in relevant ministries, commissions, and bureaus under the State Council to assume responsibility and oversight.[566] China also established 19 Standardization Research Institutes in 18 of the ministries and bureaus mentioned above.[567] Furthermore, China established the Bureau of Standards and Standardization Information Agency in 29 local governments.[568] At the end of 1984, there were 2,000 people working in the Department of Standards and Standardization Research Institutes, as well as over 8,000 people working in the Bureaus of Standards and Standardization Information Agency.[569] Over 10,000 people worked on standardization development in the Chinese central and local governments.

---

[559] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22.

[560] *Id.*

[561] *Id.,* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 62 (2014), WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 43 (2010).

[562] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23.

[563] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 43 (2010).

[564] *See* Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 6.

[565] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22-23.

[566] *Id.*

[567] *Id.* at 23.

[568] *Id.*

[569] *Id.*

B. Phase 2: Mid-1980s-Present: Compulsory and Voluntary Standards in a Transforming Economy

Since the 1980s, the PRC government started to transform its planned economy into a market-based economy. In the marketization process, China also learned from developed countries methods to reform its standardization system.[570] Passing the *Standardization Law* in 1988, the government gave up its practice of universal compulsory standards in the planned economy, and instead recognized the status of voluntary standards in its standards system.[571] The *Standardization Law* also permitted and authorized Chinese enterprises to develop standards.[572]

Despite including voluntary standards in its system and recruiting enterprises as standard-setting bodies, the PRC government nonetheless did not substantially change its standardization infrastructure.[573] The establishment of voluntary standards still required approval and resources from the government.[574] The PRC government continued to play a significant role in leading and controlling standardization activities.[575]

---

[570] Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 21 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[571] *Id.*

[572] *See Id.,* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[573] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[574] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[575] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

1. Mid-1980s-Early 2000: Passing the *Standardization Law*, Preparing to Join the WTO

China passed its *Standardization Law* in 1988, and then its *Regulation for the Implementation of the Standardization Law* in 1990.[576] The legislation marked a milestone in China's standardization development. In passing the legislation, the Chinese government attempted to transform its standardization governance from an administrative protocol to a legislative process.[577] Under the new laws, the standards in China could serve a new purpose: serving commercial and business purposes; in the past, these standards were merely focused on a manufacturing purpose.[578] Under the new laws, Chinese standards fell into one of two categories: mandatory technical regulations for public health and safety, and voluntary standards to increase efficiency.[579]

In addition to the impact at the time, the *Standardization Law* continues to govern current standardization systems in China today. Under the current system, standards in China can be categorized into four different categories: national standards, industrial standards, local standards, and enterprise standards.[580] *See* the following Figure 4-2.[581] The former three are established by the central and local governments, whereas enterprise standards are established by the private sector.[582] However, China's standards are prioritized according to the government's set levels of priority. For example, the central government can establish new national standards to replace industrial standards.[583] The new national standard then invalidates the old industrial standard.[584] Likewise, new national or industrial standards can be established to replace and invalidate local

---

[576] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23-24.

[577] Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 6.

[578] *Id.*

[579] *See Id.*

[580] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23, Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 21 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[581] *See* AM. NAT'L STANDARDS INST., PRC STANDARD SYSTEM: KEY ORGANIZATIONS, *available at* http://www.standardsportal.org/usa_en/prc_standards_system/key_organizations.aspx (last visit date: Feb. 28, 2016), SECONDED EUROPEAN STANDARDIZATION EXPERT IN CHINA, CHINESE STANDARDS, *available at* http://www.sesec.eu/chinese-standards/(last visit date: Feb. 28, 2016)

[582] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23, Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 21 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).

[583] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 31 (2010).

[584] *Id.*

standards.[585] Therefore, the central government's standards surpass other standards and are prioritized accordingly.

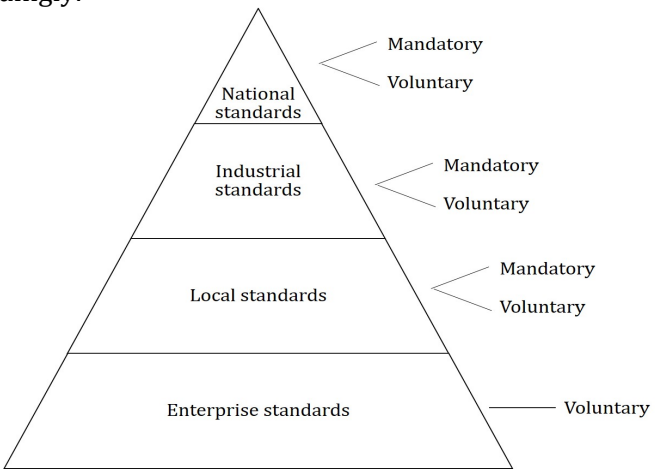


Figure 4-2: Classification of Chinese Standards
Source: American National Standards Institute ("ANSI")

Instead of simply being comprised of purely compulsory standards, the new Chinese standardization system under the *Standardization Law* was composed of a mixture of voluntary and compulsory standards. Compulsory standards are those required to enforce bylaws and administrative rules, and those involving issues of human health, personal security, and property safety.[586] Otherwise, all other standards are voluntary standards.[587] The following Table 4-2 demonstrates the percentage of compulsory and voluntary Chinese standards existing as of 2013. For national standards, 12.23% are compulsory and 87.77% are voluntary. For industrial standards, 9.18% are compulsory and 90.82% are voluntary. For local standards, 12.43% are compulsory and 87.57% are voluntary. As a whole, only 11.08% of the Chinese standards are compulsory; the other 88.92% are all voluntary.

Table 4-2: Cumulative Amount of Compulsory and Voluntary Standards in China (2013)

	National Standards		Industrial Standards		Local Standards		Total
	Compulsory	Voluntary	Compulsory	Voluntary	Compulsory	Voluntary	
amount	3,712	26,642	3,465	34,297	3,437	24,221	95,774
percentage	12.23%	87.77%	9.18%	90.82%	12.43%	87.57%	

Source: CNIS, p.36, 50, 55 (2014)

Figure 4-3 below also shows the respective percentages of compulsory and voluntary national standards since 1996. Voluntary national standards always account for 85% of the total national standards existing at the time. It seems reasonable to conclude that voluntary standards account for the majority of Chinese standards. However, the

[585] *Id.* at 11.
[586] Art. 7 of the Standardization Law, Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23.
[587] Art. 7 of the Standardization Law, Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23.

Chinese government still has the power to approve proposals for voluntary standards and the power to decide funding to support the development of these voluntary standards.[588] To some extent, these standards can be construed as not being entirely voluntary.[589]

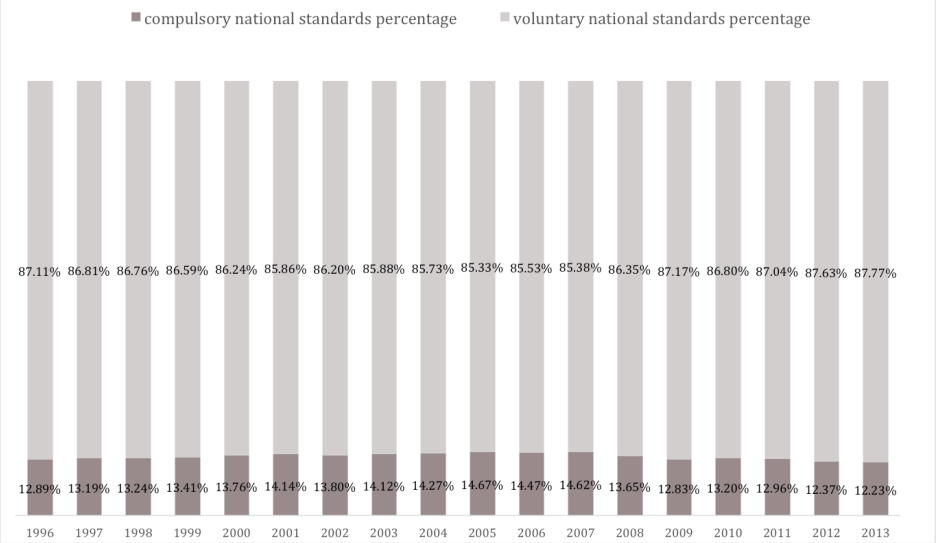


Figure 4-3: Percentage of Compulsory and Voluntary National Standards in China (1996~2013)
Source: CNIS, p.36-37 (2014)

In the 1990s, China focused on bringing its economy more in line with international practice.[590] This focus impacted the development of Chinese standards. It became an important Chinese standardization policy at the time to adopt both international standards and advanced overseas standards.[591] At the same time, China was preparing to join the WTO.[592] As China negotiated WTO admission with existing members, the issue of Chinese

[588] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[589] *See also* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8-9.

[590] *See* Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 24.

[591] *Id.* Given this standardization policy, China adopted many international and advanced overseas standards in its domestic market, such as the Internet Engineering Task Force ("IETF") internet standards, Institute of Electrical and Electronics Engineers ("IEEE") 802.11 wifi standrds, and blue tooth standards.

[592] *Id.*

standards and standardization development received widespread attention.[593] In order to join the WTO, the Chinese government was required to make 13 promises on the issue of standards and standardization.[594] These promises included signing the Technical Barriers to Trade ("TBT") Agreement and corresponding with its requirements, accepting the *Code of Good Practice for the Preparation, Adoption and Application of Standards,* and harmonizing Chinese voluntary standards with international standards.[595]

Although China ultimately joined the WTO in 2001, China was confronted with the problem of standard essential patents ("SEP"), particularly SEPs as non-tariff barriers ("NTB") in international trade.[596] The Chinese government thereafter proposed its Indigenous Innovation industrial policy to change its standard-taker position.[597]

2. Early 2000-Present: Formulating National Standardization Strategy

After joining the WTO, China recognized that technology standards and their incorporated Intellectual Property ("IP") seriously impact Chinese domestic economic development.[598] The government consequently considered standardization and IP as national-level issues, and proposed a national strategy in response.[599] In the *Tenth Five-year Plan* period (2001-2005), the Ministry of Science and Technology ("MOST") invested 200 million RMB to sponsor two significant projects concerning standardization.[600] The projects were titled "*Study on the Strategy of China's Technical Standards Development*" and

---

[593] *Id.,* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 7.

[594] Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 7.

[595] *Id.* at 7-8, Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 24.

[596] *See* Christopher S. Gibson, *Globalization and the Technology Standards Game: Balancing Concerns of Protectionism and Intellectual Property in International Standards*, 22 BERKELEY TECH. L.J. 1403, 1429-1434 (2007), CHINA MINISTRY OF COMMERCE DEP'T OF WTO AFFAIRS, BACKGROUND PAPER FOR CHINESE SUBMISSION TO WTO ON INTELLECTUAL PROPERTY RIGHT ISSUES IN STANDARDIZATION (G/TBT/W/251) (2006), *available at* http://sms.mofcom.gov.cn/article/cbw/200606/20060602564485.shtml (last visit date: Sep. 28, 2014), ZHANG JIHONG (张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN-LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 3-5 (2011).

[597] *See* Chapter 1 for further discussion regarding the background and goals of China's Indigenous Innovation policies.

[598] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 5, ZHANG JIHONG (张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 3 (2011).

[599] Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 5.

[600] *Id.*

"*Study on the Construction of a National System of Technical Standards*."[601] These projects conducted both a large-scale and intensive analysis of the standardization development process and strategies utilized by developed countries, developing countries, and standard-setting organizations ("SSOs").[602] In their conclusion, the projects suggested that China needed to increase indigenous technologies in standards, to improve regulations concerning standardization, to participate in international standard-setting competition, and to move toward a voluntary standardization model.[603]

In the beginning of the Eleventh Five-year Plan period (i.e. 2006), MOST issued the National Eleventh Five-year Scientific and Technological Development Program, and the SAC formulated the Outline of Eleventh Five-year Plan on the Development of Standardization.[604] Of significant influence on the scientific and technological development of that period, MOST's Program proposed to fully implement the national standardization strategy to safeguard scientific and technological developments in China.[605] Meanwhile, the SAC's Outline guided China to enhance its overall quality in standardization, highlight key areas for standardization, and decide research tasks for standardization.[606] More importantly, together with the fifteen-year *Medium- to Long-Term Plan for Scientific and Technological Development* ("*MLP*") since 2006, the SAC's Outline specified several key principles that the government should follow when implementing China's Indigenous Innovations policies.[607] Generally speaking, China's strategy is to use technology standards as a tool for Indigenous Innovation.[608] Dominating in the standard-setting process, the Chinese government would rather adopt its independently developed technology in setting its domestic national or industrial standards than rely on foreign technology.[609] For China, the goal of its national standardization strategy or Indigenous Innovation policy was to reduce its technological dependence on foreign companies.[610]

Since 2000, the Chinese government has invested significant resources in studying ways to formulate its national standardization strategy. The government thereafter issued many relevant guidelines and policies, which aimed to transform China's position from standard taker, to standard co-setter and lead-setter.[611] Now, the fundamental principle of the Chinese national standardization strategy is to let the "government lead, enterprises

---

[601] *Id.*
[602] *Id.*
[603] *Id.*
[604] *Id.* at 6.
[605] *Id.*
[606] *Id.*
[607] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 23 (2011). *See* Chapter 1 for further discussion regarding the background and goals of China's Indigenous Innovation policies.
[608] *Id.* at 19.
[609] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 6.
[610] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 24 (2011).
[611] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 5, 9.

direct, and the market guide." (*zhengfu yindao, qiye wei zhuti, shichang wei daoxiang* 政府引导,企业为主体,市场为导向)[612] This strategy includes:

(1) Transitioning to a voluntary standards system fitting market economy;
(2) Improving market adaptability of Chinese national and industrial standards;
(3) Harmonizing relations between standards, technological innovation, IP protection, and industry upgrades;
(4) Adopting international standards with efficiency, joining international competition on selection, and supporting Chinese indigenous technology as international standards.[613]

Regardless of whether this happens now or in the future, this strategy significantly impacts China's technological and scientific development.

II. Chinese Standardization Legislation

A. Historical Development

The State Council issued the first regulation regarding standardization in China in 1962, titled *Regulation for the Technology Standard Administration of Industrial and Agricultural Products and Construction Engineering* (hereinafter "Regulation in 1962").[614] The Regulation in 1962 contained clear provisions on the principles, policy, tasks, and administrative mechanism for standardization development.[615] Based on the Regulation in 1962, the State Council issued the *Regulation for Standardization Administration* in 1979 (hereinafter "Regulation in 1979").[616] The Regulation in 1979 not only summarized China's thirty-year experience of standardization development, but also provided a design for China's new future in a modernized economy.[617] Under the Regulation in 1979, standardization development served to advance national economy and facilitate the realization of four modernizations in China.[618] The Regulation in 1979 classified Chinese standards into three categories only: national standards, ministerial standards, and enterprise standards.[619]

The National People's Congress ("NPC") passed the *Standardization Law* in 1988.[620] Two years later, the State Council issued the *Regulation for the Implementation of the*

---

[612] *Id.* at 9.
[613] *Id.*
[614] Li Chuntian (李春田), Diyizhang Xulun (第一章绪论) [Chapter 1 Introduction], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 1, 16 (Li Chuntian (李春田) et al. eds., 6th ed. 2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 39 (2007).
[615] Li Chuntian (李春田), Diyizhang Xulun (第一章绪论) [Chapter 1 Introduction], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 1, 17 (Li Chuntian (李春田) et al. eds., 6th ed. 2014).
[616] *Id.*
[617] *See id.*
[618] *See id.*
[619] ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 38 (2007).
[620] *Id.* at 39.

Standardization Law in 1990, which provides details on how to implement the *Standardization Law*.[621] The passage of the *Standardization Law* was supposed to signify that China's governance in standardization transformed from an administrave one to a legislative one.[622] More importantly, the *Standardization Law* decided current classifications and the administrative system of Chinese standards (*see supra* Ⅰ. B. 1).[623] The reform in the *Standardization Law* was intended to help China's standardization system fit China's transforming economy at that time.[624]

B. Current Structure

The *Standardization Law* and *Regulation for the Implementation of the Standardization Law* were the most fundamental rules for Chinese standardization development.[625] They formulated the main infrastructure for Chinese standardization legislation. In addition, different government institutions led the standardization development in China.[626] Within their authority, these institutions issued different regulations and legislations regarding standardization at the national, industrial, and local levels.[627] Together with the *Standardization Law* and *Regulation for the Implementation of the Standardization Law*, these regulations and legislation formed a clear and hierarchical infrastructure for Chinese standardization legislation as shown in Figure 4-4.[628] The regulations and legislation can generally be classified into the following three categories:

- The first category is regulations issued by the competent department in charge of standardization under the State Council, the General Administration of Quality Supervision, Inspection and Quarantine ("AQSIQ").[629] AQSIQ's regulations included

---

[621] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23-24, Li Chuntian (李春田), Diyizhang Xulun (第一章绪论) [Chapter 1 Introduction], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 1, 17 (Li Chuntian (李春田) et al. eds., 6th ed. 2014), WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 29 (2010).

[622] Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 6. However, even though the language and text of the law may change, it cannot deprive the Chinese Communist Party ("CCP") of power, so in effect, these changes had no real effect in changing the existing system. All real power in China is vested within the CCP. Whether or not the change is a regulation or a law, the CCP's power will not change.

[623] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 29 (2010).

[624] *See* Li Chuntian (李春田), Diyizhang Xulun (第一章绪论) [Chapter 1 Introduction], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 1, 17 (Li Chuntian (李春田) et al. eds., 6th ed. 2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 38 (2007).

[625] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 30-31 (2010).

[626] *See id.* at 31, 39.

[627] *See id.* at 33.

[628] *See id.*

[629] *Id.* at 33-34.

standardization management, publication of standards, record management of standards, establishment of national, industrial, local standards.[630] Examples of these regulations are: *Regulation for Standard Publication Administration*, *Regulation for Standard Record Management*, *Regulation for National Standard Administration*, *Regulation for Industrial standard Administration*, *Regulation for Local Standard Administration*.[631]

- The second category is regulations issued by other ministries under the State Council.[632] These regulations are mainly relevant to the administration of industrial standards.[633] For example, the National Development and Reform Commission ("NDRC") issued in 2005 the *Regulation for Administration of Industrial Standard Setting*.[634]
- The third category is regulations and legislation issued by local governments and the local People's Congress respectively.[635] They are mainly to administer local standards, as well as to implement national and industrial standards.[636]

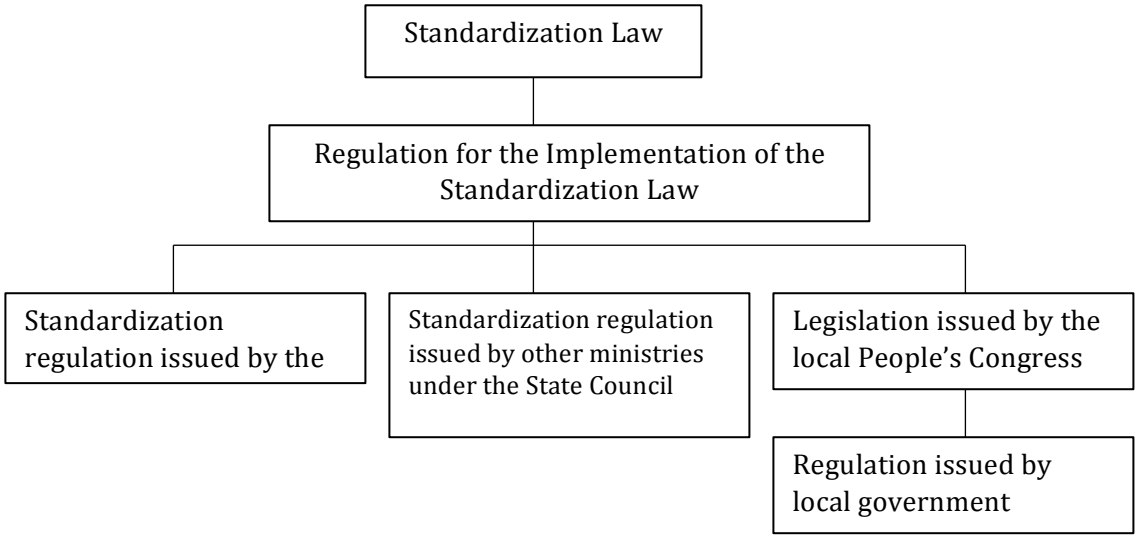


Figure 4-4: Infrastructure of Chinese Standardization Legislation
Source: WANG ZHONGMIN, p.33

III. The Role of the Chinese Government

The Chinese government plays a significant role in its standardization development. Generally speaking, the government administers standardization, as well as formulates and researches standards. The following sections will discuss these three perspectives in sequence.

A. Administering Standardization

[630] *Id.* at 34.
[631] *See id.*
[632] *Id.* at 33, 35.
[633] *Id.* at 35.
[634] *Id.*
[635] *Id.* at 33.
[636] *Id.* at 36.

The Chinese government applies a fairly hierarchical and organized structure in managing its standardization activities. Generally speaking, the central government leads standardization development; however, relevant competent authorities and local governments have taken these responsibilities on an individual basis.[637]

As shown in the following Figure 4-5, the top of the pyramid indicates the department in charge of standardization under the State Council. This department exercises unified leadership over the standardization work throughout the country.[638] In the middle of the pyramid, the figure displays the relevant competent authorities under State Council, and these authorities are in charge of the standardization work in their own departments or industries.[639] The bottom of the pyramid shows a similar structure for the local government, which includes provinces, autonomous regions, and municipalities directly under the central government.[640] In their respective administrative regions, the administrative departments for standardization exercise unified leadership over standardization work; the local authorities are then responsible for the standardization work in their own departments and industries.[641]

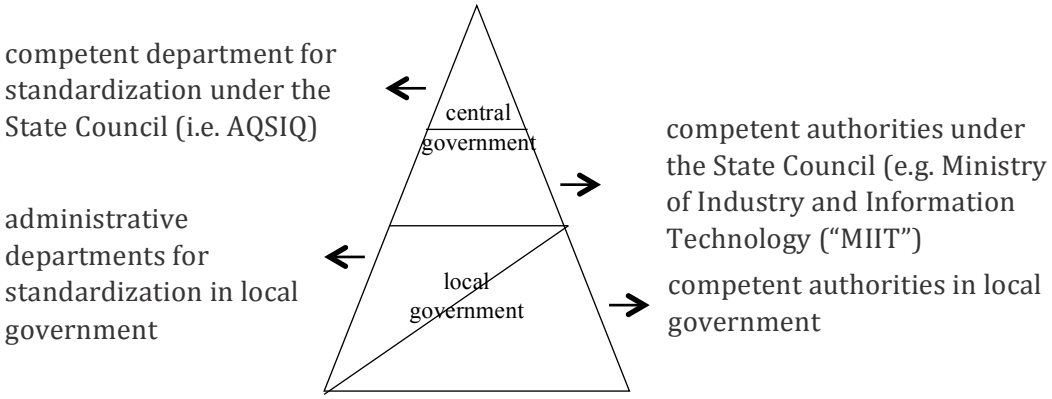


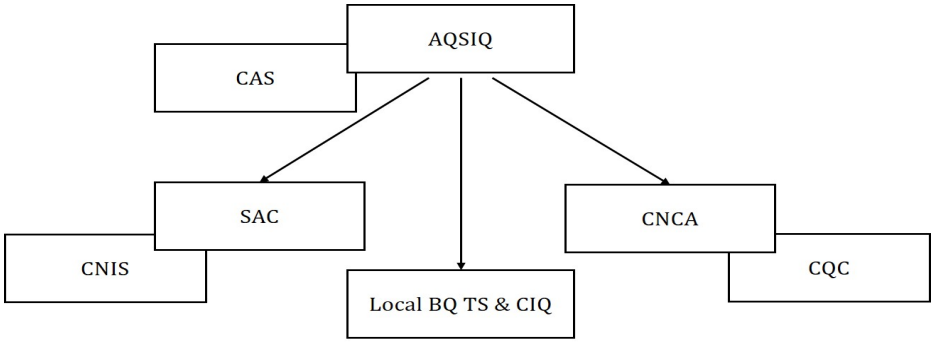
Figure 4-5:Chinese Standardization Administration System
Source: Compiled by the author

At the top of the hierarchical structure is the General Administration of Quality Supervision, Inspection and Quarantine ("AQSIQ"). *See* Figure 4-6. Administered by AQSIQ, the Standard Administration of China ("SAC") is authorized by the State Council to exercise unified administration and oversees the administrative responsibilities for standardization tasks in China.[642] The SAC was established in 2001, its predecessor being the SGBS and State Administration of Standardization ("SAS").[643] The SAC's tasks and duties include:

---

[637] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 23.
[638] Art. 6 of the Regulation for the Implementation of the Standardization Law
[639] Art. 7 of the Regulation for the Implementation of the Standardization Law
[640] Art. 8, 9 of the Regulation for the Implementation of the Standardization Law
[641] Art. 8, 9 of the Regulation for the Implementation of the Standardization Law
[642] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 39 (2010).
[643] *Id.*

developing national standards, organizing to implement the State's standardization regulations, organizing to formulate national standardization programs, guiding and coordinating lower institutes in their standardization work, contacting relevant international standardization organizations.[644]



AQSIQ = Administration for Import and Export Control (Ministry)
SAC = Standard Administration of China
CNCA = China National Certification & Accreditation Administration
CNIS = China National Institute for Standardization
CQC = China Quality Centre
CAS = China Association for Standardization

Figure 4-6:The AQSIQ Standardization Family
Source: DIET ERNST, p.30

At the middle of the hierarchy are competent authorities under the State Council, such as the Ministry of Industry and Information Technology ("MIIT"), Ministry of Environmental Protection ("MEP"), Ministry of Housing and Urban-Rural Development ("MHURD"), Ministry of Health of ("MoH").[645] These different ministries are in charge of the standardization work in their own industries, so they may promote, establish, and adopt standards for the respective industry fields they are responsible for.[646] For example, MIIT is highly active in the information and communication technology ("ICT") industry.[647] Many of China's indigenous technological standards, such as TD-SCDMA and WAPI standards, have been developed under MIIT's auspices.[648] In addition to developing industrial standards, these ministries are responsible for implementing the State's standardization regulations, formulating standardization programs in accordance with their respective responsibilities, undertaking State-assigned tasks in drafting national standards, guiding local government in its standardization work.[649]

---

[644] Art. 6 of the Regulation for the Implementation of the Standardization Law
[645] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 40 (2010).
[646] *See* DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 16-17 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).
[647] *Id.*
[648] *Id.* at 20.
[649] Art. 7 of the Regulation for the Implementation of the Standardization Law

At the bottom of the hierarchy is the local government, which is composed of administrative departments for standardization and the competent authorities in each administrative region.[650] Generally speaking, the primary task of the local government is to develop local standards, implement standardization regulations of the State or superior-level competent authorities, and formulate standardization programs in local government.[651] Examples of the local administrative departments are the Beijing Municipal Administration of Quality and Technology Supervision and Zhejiang Bureau of Quality and Technical Supervision.[652]

Table 4-3 demonstrates the cumulative number of Chinese national standards, industrial standards, and local standards during the period of 1999-2009. These standards were developed at three different levels as mentioned above. Among them, industrial standards accounted for 45%~52%, national standards accounted for 26%~32%, and local standards accounted for 15~24%.

Table 4-3: Cumulative Amount of National, Industrial, and Local Standards in China (1999-2009)

Year	National Standards		Industrial Standards		Local standards		Total
	Amount	Percentage	Amount	Percentage	Amount	Percentage	
1999	19,118	32.78%	30,000	51.44%	9,200	15.78%	58,318
2000	19,278	30.47%	32,000	50.57%	12,000	18.96%	63,278
2001	19,744	31.19%	31,900	50.39%	11,660	18.42%	63,304
2002	20,206	30.12%	34,300	51.13%	12,580	18.75%	67,086
2003	20,906	29.36%	36,000	50.56%	14,300	20.08%	71,206
2004	21,342	28.46%	37,850	50.47%	15,800	21.07%	74,992
2005	20,688	26.58%	40,070	51.48%	17,079	21.94%	77,837
2006	21,410	29.28%	33,552	45.89%	18,155	24.83%	73,117
2007	21,569	30.74%	36,589	52.15of %	12,003	17.11%	70,161
2008	22,931	29.87%	39,686	51.7%	14,142	18.43%	76,759
2009	23,657	28.92%	42,765	52.29%	15,360	18.78%	81,782

Source: KUANG BING, p.156-157, CNIS, p.16 (2010).

B. Formulating Standards

The current Chinese standardization administration system is composed of a vertical hierarchy at different levels and a horizontal array of complementary institutions.[653] Generally speaking, the SAC under AQSIQ develops national standards; different ministries under the State Council develop their own respective industrial standards; and local governments develop local standards. However, these government institutions administrate

[650] Art. 8, 9 of the Regulation for the Implementation of the Standardization Law
[651] Art. 8, 9 of the Regulation for the Implementation of the Standardization Law
[652] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 42-43 (2010).
[653] Chaoyi Zhao & John M. Graham, *The PRC's Evolving Standards System: Institutions and Strategy*, 2 ASIA POL'Y 63, 64 (2006).

and coordinate standardization activities.[654] These institutions are the final decision makers for the finalized drafted standards.[655] The draft and preparation of the standards used to take place in the institutes' Technical Committees ("TCs") or Subordinate Technical Committees ("STCs").[656]

In China, each of the government institutions mentioned above has its own TCs and STCs to help these government institutions formulate standards specific to the technological field.[657] The Chinese government established the TCs in 1979.[658] As time went on, the government recognized the importance of the TCs or STCs, so these committees' total number of standards increased in the technological field.[659] *See* Figure 4-7 and Figure 4-8. In the end of 2013, there are in total 521 national TCs and 715 STCs, which mainly helped formulate national standards.[660] There are also over 572 local TCs, which help to formulate local standards.[661]

---

[654] Wang Ping, *On Standardization in China*, TALKSTANDARDS (Aug. 16, 2010, 6:00 pm), http://www.talkstandards.com/on-standardization-in-china/

[655] *Id.*

[656] *Id.*

[657] *See* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 62 (2014). Subordinate Technical Committees (STCs) are formed when the given technology is too broad. WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 45 (2010).

[658] Wang Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22, 22, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 62 (2014), WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 43 (2010).

[659] ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 62-63 (2014).

[660] *Id.* at 62.

[661] *Id.* at 67. As for TCs that help different ministries formulate industrial standards, it is both difficult to obtain and manage the information, because over 60 ministries have developed industrial standards of their own. Interview with CNGOV-3, 2015. *See also* SECONDED EUROPEAN STANDARDIZATION EXPERT IN CHINA, CHINESE STANDARDS, *available at* http://www.sesec.eu/chinese-standards/(last visit date: Feb. 28, 2016).

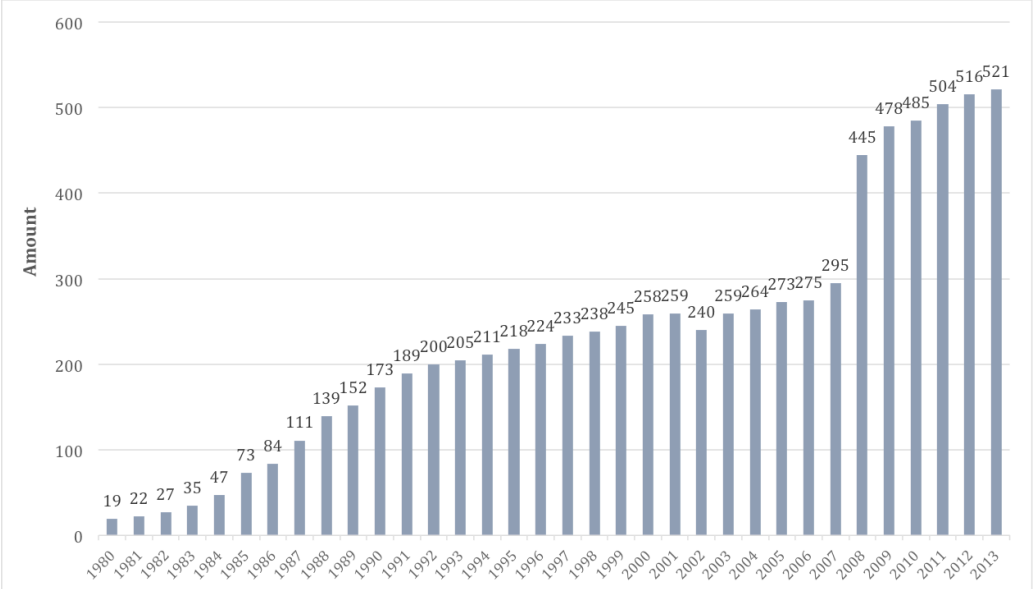


Figure 4-7:The Development of National TCs in China (1980-2013)
Source: CNIS, p.63(2014)

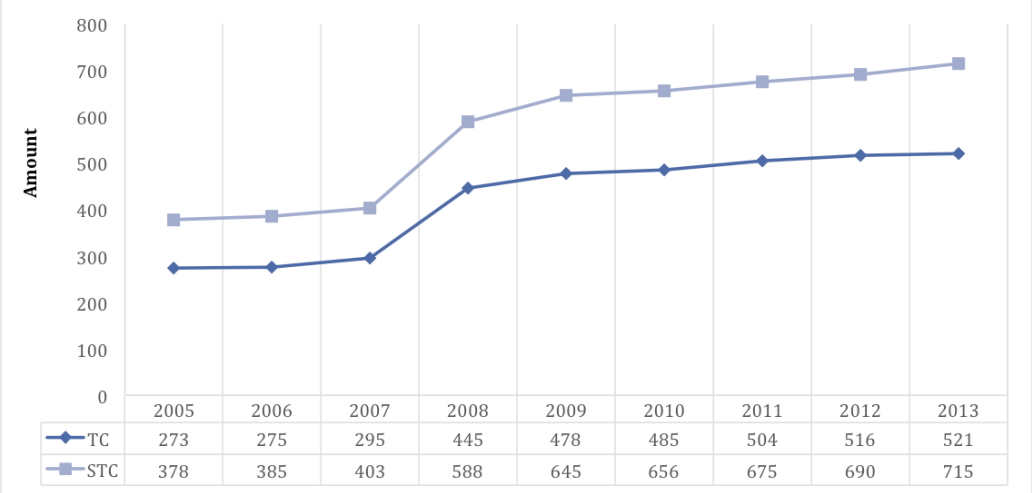


Figure 4-8:The Development of National TCs and STCs in China (2005-2013)
Source: CNIS, p.63(2014)

The TCs and STCs are professional organizations consisting of authoritative technology experts.[662] Their primary tasks are to draft technology standards and examine technology

[662] Xuan Xiang (宣湘), Diqizhang Jishu Biaozhun (第七章技术标准) [Chapter 7 Technology Standard], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 103, 107 (Li Chuntian (李春田) et al. eds., 6th ed. 2014). There should be at least 25 committee members in TCs and 15 committee members in STCs. WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 46 (2010).

solutions, which can help formulate, revise, and maintain technology standards.[663] The Chinese government encourages the (S)TCs to have a diverse composition of professionals in order to obtain different ideas and opinions.[664] The committees consist of representatives from government agencies, research institutes, testing institutes, state-owned enterprises, private enterprises, university, industry association, consumers.[665] In other words, the committees have great experience and knowledge in manufacturing, research, usage, marketing, and testing.[666] In addition, every (S)TC has its own subordinate secretariat.[667] The secretariat then takes care of the daily routine work for the (S)TC's operation.[668]

Despite the diversity in (S)TCs, research institutes instead have a greater innovative capacity than private sectors do in China's current economy.[669] In addition, Chinese society tends to consider standards as public rights and public property.[670] Research institutes funded by the government are considered to be for the public interest.[671] Thus, research institutes play influential roles in (S)TCs, as well as significantly impacting how standards

---

[663] Xuan Xiang (宣湘), Diqizhang Jishu Biaozhun (第七章技术标准) [Chapter 7 Technology Standard], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 103, 107 (Li Chuntian (李春田) et al. eds., 6th ed. 2014), WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 46-47 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 62 (2014).

[664] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 45 (2010).

[665] *Id.*

[666] Xuan Xiang (宣湘), Diqizhang Jishu Biaozhun (第七章技术标准) [Chapter 7 Technology Standard], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 103, 107 (Li Chuntian (李春田) et al. eds., 6th ed. 2014),

[667] *Id.*

[668] *Id.,* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 46-47 (2010).

[669] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 44 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 64-65 (2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] 26 (2010).

[670] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 45 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] 26 (2010).

[671] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 45 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 64-65 (2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] 26 (2010).

are formulated and revised in China.[672] As shown in the following Table 4-4 , research institutes are in charge of over 60% of the secretariat for national TCs in both 2008 and 2013. Even though private enterprises and industry associations are growing more important in the Chinese economy, these enterprises and associations merely account for less than 10% of the secretariat.[673] Despite minor changes from 2008 to 2013, the private sector has not taken a leading role in standardization development in China.[674]

Table 4-4:Secretariat Undertaker in National TCs: 2008 and 2013 Comparison

Undertaker	Year	
	2008	2013
Research institutes	66.45 %	63%
Testing institutes	6.08 %	5%
Enterprises	7.88 %	10%
Associations, alliances	8.78 %	17%
Ministries, commissions	9.23 %	
Universities, publishers	1.58 %	5%

Source: CNIS, p. 64 (2014), CNIS, p. 26 (2010)

C. Researching Standardization

In addition to managing standardization and formulating new standards, the Chinese government conducts in-depth research on standardization. The government has long established different standardization research institutes at the national, industrial, and local levels.[675] The hierarchy is similar to the infrastructure mentioned in Figure 4-5. Located at the top, the SAC has a national standardization research institute named the China National Institute of Standardization ("CNIS"), which focuses on issues pertaining to national standards. In the middle, the competent authorities under State Council may establish its own industrial standardization research institute, which focuses on industrial standards. At the bottom, local governments also have their own local standardization research institutes, which focus on issues pertaining to local standards. These different levels of

[672] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 44-45 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 64-65 (2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] 26 (2010).

[673] *See also* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] 26-27 (2010), WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 44-45 (2010).

[674] *See also* Wang Ping & Liang Zheng (王平&梁正), *Woguo Xiehui he Lianmeng de Biaozhunhua Fazhan Yanjiu* (我国协会和联盟的标准化发展研究) [*Study on Evolution of Standardization in National Associations and Alliances*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.8, 2013, at 59, 62.

[675] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 53 (2010).

standardization research institutes serve as "think tanks" for the central and local governments.[676] Their primary tasks include undertaking fundamental standardization research, as well as providing standard information.[677]

CNIS is the only national research institute engaged in standardization research.[678] CNIS has over 50 years of history, and is now directly affiliated with the SAC and AQSIQ.[679] . *See* Figure 4-6. CNIS's main responsibilities include: (1) conducting global, strategic and comprehensive research on standardization issues during the development process of the Chinese economy and society; (2) researching and developing comprehensive fundamental standards; and (3) providing authoritative standard information services.[680] Both AQSIQ and the SAC have used CNIS as their think tank to make standardization policies and supervise market dynamics.[681] Since the 1980s, CNIS has conducted extensive national-level research for the Chinese government, such as drafting the *Standardization Law,* drafting the *Regulatory Measures on National Standards Involving Patents (Interim)*, and conducting the *Study on the Strategy of China's Technical Standards Development* and the *Study on the Construction of a National System of Technical Standards,* projects funded by MOST.[682]

While CNIS is the only national research body, various industrial standardization research institutes exist as well to help different ministries or their subordinate units conduct research on industrial standards.[683] These institutions may exist in different organizational forms, and they tend to have different work content.[684] The research institutes are affiliated with the ministries or their subordinate units, so most of their funding comes from these ministries and units rather than the State.[685] Additionally, each

---

[676] *See* Wang Ping, *CNIS Role in Chinese Standardization*, TALKSTANDARDS (Aug. 16, 2010, 6:00 pm), http://www.talkstandards.com/cnis-role-in-chinese-standardization/

[677] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 53 (2010).

[678] Id., AM. NAT'L STANDARDS INST., PRC STANDARD SYSTEM: KEY ORGANIZATIONS, *available at* http://www.standardsportal.org/usa_en/prc_standards_system/key_organizations.aspx (last visit date: Feb. 28, 2016).

[679] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 30 (2011), WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 53 (2010). The CNIS was known as the Institute of Standardization of the State Science and Technology Commission when established in 1963. *See* CHINA NAT'L INST. OF STANDARDIZATION, ABOUT CNIS, *available at* http://en.cnis.gov.cn/bzygk/kyly/ (last visit date: Feb. 28, 2016).

[680] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 53 (2010), AM. NAT'L STANDARDS INST., PRC STANDARD SYSTEM: KEY ORGANIZATIONS, *available at* http://www.standardsportal.org/usa_en/prc_standards_system/key_organizations.aspx (last visit date: Feb. 28, 2016), CHINA NAT'L INST. OF STANDARDIZATION, ABOUT CNIS, *available at* http://en.cnis.gov.cn/bzygk/kyly/ (last visit date: Feb. 28, 2016).

[681] Wang Ping, *CNIS Role in Chinese Standardization*, TALKSTANDARDS (Aug. 16, 2010, 6:00 pm), http://www.talkstandards.com/cnis-role-in-chinese-standardization/.

[682] *Id. See* Chapter 6 for further discussion regarding the *Regulatory Measures on National Standards Involving Patents (Interim)*.

[683] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 53-55 (2010).

[684] *See id.* at 54-58.

[685] *See id.* at 54-55.

local government also has its own subordinate standardization research institutes. The primary responsibility for these local standardization research institutes is to provide services regarding local standard information, commodity bar codes, and enterprise codes.[686] These official local standardization research institutes are now primarily self-funded and funded by the private sector, and is not purely reliant on the government.[687] This means that local institutions are recognizing the importance of marketization, which is beneficial to increasing the quality and adaptability of local standards in the future.[688]

IV. Chinese Standardization Reform

The Chinese government established its own standardization administration system as early as 1988 when the *Standardization Law* was first enacted.[689] Developed nearly 30 years ago, China's standardization system emerged while China was still under a planned economy and slowly transitioning into a market economy.[690] China remains in this transitional phase into a market economy today.[691] In particular, the Chinese economy became interconnected with the global economy after joining the WTO.[692] Given this change, China's traditional system of standardization faced the challenge of meeting the

---

[686] *Id.* at 59.
[687] *Id.*
[688] *Id.*
[689] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8, DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 7 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).
[690] *See* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 14 (2014), KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 165 (2011), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 41 (2007), Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8.
[691] *See* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 12-13 (2007), Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 6.
[692] *See* KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 165 (2011), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 11 (2007).

requirements of social and economic development.[693] In response, the government began a new program called *Strengthening Standardization Reform* in 2015.[694] The purpose of this new program was to improve the Chinese standardization system, increasing the competitiveness and adaptability of Chinese-developed standards.

A. Problems in China's Existing System

1. Overlapping and Conflicting Standards

Prior to the introduction of the recent *Strengthening Standardization Reform,* China's standardization system encountered a number of problems. The first problem existing at the time was overlapping and conflicting Chinese standards.[695] To manage its standardization activities, China established a hybrid administrative and institutional system composed of a vertical hierarchy of four levels and a horizontal array of complementary institutions.[696] However, this system often lacked coordination between its institutes and their standards, many of which overlapped and conflicted with each other.[697] For example, as of this writing, there are around 2,000 national, industrial, and local

---

[693] *See* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 14 (2014), KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 165 (2011), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 11, 41, 45-46 (2007), Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8, Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[694] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China). *See also* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 14 (2014).

[695] ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 14 (2014), Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[696] Chaoyi Zhao & John M. Graham, *The PRC's Evolving Standards System: Institutions and Strategy*, 2 ASIA POL'Y 63, 64 (2006), DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 5 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[697] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

standards, each of which shares with at least one other standards a confusingly similar or identical name.[698] Without coordination in this hierarchical structure, some national standards overlapped with industrial or local standards, and vice versa.[699] Because different ministries and local governments developed their standards independently, many standards were redundant at times.[700] These overlapping standards imposed multiple requirements on enterprises to meet, which created an undue burden on these entities to comply with these standards. The lack of coordination wasted government resources, especially in setting and enforcing these standards.[701]

In addition, some of these overlapping standards created conflicting technological requirements for enterprises.[702] This problem arose especially when the technology was used in multiple technological fields.[703] Because ministries held different positions in this matter, the problem of conflicting industrial standards was further exacerbated.[704] Given these conflicting requirements, enterprises struggled to adopt the standards, and consequently, the government also faced hardship in enforcing these standards.[705] The conflicting standards presented by government bodies that did not coordinate their work with each other proved harmful to consumers and deterred industry development in China.[706] The overlapping and conflicting standards harmed the credibility of the standards themselves and the government that created and enforced them. They also impaired the public welfare of consumers and society.

2. Deficient Market Participation

In China, the central and local governments developed national, industrial, and local standards. These efforts reflected planned economy thinking that the government should actively and heavily direct standard development, rather than rely on the market and

---

[698] *Id.*

[699] *Id.,* Interview with CNGOV-3, 2015.

[700] Interview with CNGOV-3, 2015, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 11, 41, 45-46 (2007).

[701] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[702] *Id.*

[703] *See id.*

[704] *See id.,* Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 7, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 45-46 (2007).

[705] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 165-166 (2011).

[706] Interview with CNGOV-3, 2015.

private sector.[707] However, 70% of China's effective standards were related to general products and services, and not those involving human health and security issues.[708] In other words, most of the existing Chinese standards would be classified in a western country as voluntary standards, rather than compulsory standards.[709] These voluntary standards are ultimately applied in the market and adopted by enterprises, which results in market and enterprise-led standard-setting.[710] Today, many Chinese voluntary standards may not be widely adopted because they did not originate from the market and its market players.[711]

In addition, research institutes funded by the Chinese government still play significant roles in (S)TCs and have a great impact on formulating standards.[712] Unfortunately, both

---

[707] *See* DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 5 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 45 (2007).

[708] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[709] ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15 (2014).

[710] *See also* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8, Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9-10, KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 166 (2011).

[711] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8, Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9-10, KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 163 (2011).

[712] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 44-45 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 64-65 (2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] 26 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 44 (2007), KUANG BING (邝兵),

government officials and scientists in the research institutes have a limited understanding of the market and enterprise needs.[713] As a result, the government-developed standards or (S)TCs-proposed technology solutions often depart from the needs of the market.[714] Even though the government recognized this problem and attempted to increase diversity in (S)TCs, it is questionable whether the process is transparent, fair, and open.[715] Current government-led standardization systems continue to lack ideas and innovation from the market and private sector. Neither the market nor the private sector can effectively supervise the government's standardization development.[716] Continuing to bear characteristics of a traditional planned-economy, China's standardization system is incompatible with a nation that is transitioning into a market economy, and often falls behind in terms of market development.[717] But, it is compatible with socialism, bearing Chinese characteristics, which is exhibited as continued Chinese Communist Party ("CCP") control.

When China transformed its economy to a hybrid economy and connected with the global economy, this transformation upgraded the Chinese industry and increased the

---

BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 163 (2011).

[713] *See* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 10.

[714] *See id.*, KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 166 (2011).

[715] *See* Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 7, Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 10, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 44, 46 (2007).

[716] ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 44, 46-47 (2007).

[717] *See* Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 7, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 11, 41, 45-46 (2007), KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 165 (2011), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 14 (2014).

innovation capacity of Chinese domestic enterprises.[718] Despite the strides made in obtaining innovative technology and recognizing the significance of standards, private enterprises and their formed industry associations still played a limited role in standard-setting under Chinese regime.[719] Particularly, industry associations were not eligible to formulate standards for the association's and its participants' use, which is widely-used in the world.[720] Because of this, market-led and bottom-up standards rarely exist under the Chinese regime.[721] The private sector is prohibited from releasing its innovative ideas and the government cannot access this innovative technology, dampening development in the Chinese industry.[722]

3. Low quality and coverage

As of 2015, the Chinese government has developed more than 100,000 national, industrial, and local standards.[723] The number of existing standards is indicative of the government's efforts in standards development.[724] However, it is questionable whether the government's efforts and investment resulted in any returns.[725] Despite the quantity of standards, many of the Chinese standards update at such slow rates that the old standards

---

[718] *See* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 10 (2007).

[719] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 10, 43-44 (2007), KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 163, 166 (2011).

[720] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 10, 43 (2007), Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[721] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[722] *See* KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 167 (2011).

[723] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[724] *See* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 10.

[725] *See id.*

cannot meet the requirements of a rapidly-changing industry.[726] Many of these standards are also low in quality and cannot support upgrades in the Chinese industry.[727] This occurs partially because Chinese standards are usually of such low-quality that they are seldom adopted or recognized as international standards.[728] As a result, China only held 0.5% of all international standards in 2015.[729] In addition, Chinese standardization development is not universal; it merely focuses on some specific industrial areas. As a result, China still lacks standards in some technological areas, such as agriculture, services, e-commerce, and business logistics.[730]

B. Ongoing Change

Recognizing the problems mentioned above, the Chinese government implemented the *Strengthening Standardization Reform* in 2015 to improve its current standardization system.[731] The government reconsidered its governing role in standardization development in its transforming economy.[732] In the 2015 Reform, the government relinquished some of its authority and responsibilities to the private sector in standard-setting, in the hope of obtaining more innovation from the market and developing market-oriented standards.[733]

Meanwhile, with its remaining authority, the government became stricter in standardization governance than in the past.[734] The Reform granted the private sector more

---

[726] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China). *See also* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 14 (2014). All the other nations, including the United States, updated their standards at a slow rate, too.

[727] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[728] *Id. See also* KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 164 (2011). The other reasons at a minimum include China's low participation in international standard-setting activities and China's heavy reliance on Western standards.

[729] *Id. See also* KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 164 (2011).

[730] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[731] *See id*.

[732] *See id*

[733] *See id,* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15 (2014).

[734] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013

authority to develop standards; the government was consequently allowed to save its administrative resources and focus on the governance of limited standards.[735] The objective of the Reform was to bifurcate China's standardization model into two tracks: one that is government-led and one that is private sector-led.[736] The former track emphasized maintaining solid foundation; the latter emphasized enhancing competitiveness.[737] These two tracks were designed to improve collaboration and coordination for standard-setting activities in different sectors of the economy in order to improve the current Chinese standardization system.[738] China ultimately hopes that future standardization development may be led by the government, motivated by the market, participated by society, and pushed by both the public and private sectors.[739]

In light of the Reform, the government restructured its standardization administration system, as seen in Table 4-5. Generally speaking, government-led standards changed from six categories to four categories.[740] The competent authorities and local governments no longer issued new compulsory industrial and local standards.[741]

On the other hand, private-sector setting standards increased from one category to two categories.[742] Industry associations may now develop "association standards" in China.[743] Moreover, when these industry associations become much more competent and mature in the future, the Chinese government may release to associations the authority and responsibility of developing voluntary industrial standards.[744] The following section discusses in detail primary changes from the Reform.

ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15 (2014).

[735] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15 (2014).

[736] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[737] *Id.*

[738] *See id.*

[739] *See id.*

[740] *Id.*

[741] Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[742] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[743] *See id.*

[744] *See* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 43 (2007), Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji*

Table 4-5: Chinese Standardization System: Before and After Reform

Characteristic	Item	Before Reform		After Reform	
		Compulsory	Voluntary	Compulsory	Voluntary
Government led	National standard	X	X	X	X
	Industrial standard	X	X		(X)
	Local standard	X	X		X
Private sector set	Enterprise standard		X		X
	Association standard				X

Source: Compiled by the author

1. Simplifying Compulsory Standards

In light of the Reform, China will no longer develop compulsory industrial and local standards in the future, merely keeping compulsory national standards in its standardization system.[745] However as of 2013, China has already accumulated 3,712 compulsory national standards, 3,465 compulsory industrial standards, and 3,337 compulsory local standards.[746] The Chinese government has already begun to review and clean up these existing compulsory standards, amounting to over 10,000.[747] The government plans to merge the compulsory standards from three different levels into a single national level.[748] In addition, the government plans to restrict compulsory standards

---

Fazhan Fangxiang (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 7, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15, 30 (2014).

[745] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[746] ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 36, 50, 55(2014).

[747] Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[748] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15 (2014).

only to specific areas, such as human health, human life, property safety, national security, and environmental safety.[749] Standards not in these areas would move to the category of voluntary standards.[750] Regarding the future of standardization administration, the State Council will have the authority to approve and issue these standards; the SAC will be responsible for project approval and numbering of the standards; the competent authorities under the State Council will take charge of proposing and drafting the standards, requesting public comment, examining technology, enforcing, and supervising.[751]

2. Creating Association Standards

The Reform included industry associations as one of the standard-setting bodies in the current Chinese standardization system.[752] Prior to the Reform, only the government and enterprises were permitted to set up standards; industry associations had a very limited function in standard-setting. After China opened and reformed its economy, the Chinese private sector assumed a more innovative and active role in the market economy. The Reform legalized industry associations to develop "association standards" so that the Chinese standardization system could obtain more ideas originating from the market.[753] These association standards are for voluntary use in the market, so the market ultimately decides the success or failure of these standards.[754]

In addition, industry associations may develop and issue association standards independently.[755] The association standards do not need to get prior approval from the government.[756] As a result, the government plays a limited and passive role in developing association standards. The government will merely provide *Guidelines Regarding Developing Association Standards* and the *Code of Good Practices for Standardization*.[757]

---

[749] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15 (2014).

[750] *See* Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[751] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[752] *See id.*

[753] *See id.*

[754] *See id.,* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 16(2014).

[755] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[756] *Id.*

[757] Id., Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化

Otherwise, the government will mostly leave the market to decide the development of association standards, and will intervene only when necessary.[758]

3. Optimize Voluntary Standards

In this Reform, it appears that the infrastructure of government-led voluntary standards did not change very much. The SAC, different ministries, and local governments continued to develop voluntary national, industrial, and local standards. However, the Chinese government attempted to reduce the amount and scale of their voluntary standards- 26,642 at the national level, 34,297 at the industrial level, 24,221 at the local level in 2013.[759] The government is now reviewing and refining the voluntary standards at three levels.[760] In the future, the government will transition to only developing voluntary standards with the public interest in mind.[761] Moreover, the government also plans to leave the market and industry associations to themselves in hopes that they will develop voluntary industrial standards.[762]

工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China). There are no negative legal consequences for violating the *Guidelines Regarding Developing Association Standards* and *Code of Good Practices for Standardization*, because the rules are for voluntary standards and were established to guide the association standards without legal effect. Interview with CNGOV-3, 2015.

[758] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

[759] *Id.*, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 36, 50, 55(2014).

[760] *See* Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[761] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China). *See also* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15 (2014).

[762] *See* Fang Qing & Yu Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4, 7, ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 43 (2007), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15, 30 (2014).

The Reform also made some improvements to the current Chinese standardization system. These improvements may help to avoid problems that existed when the government used the same infrastructure to develop voluntary standards.

- First, the Reform clarifies the standardization scope among different levels.[763]
- Second, the Reform sought to open up the standard-setting process so that the private sector could supervise the process and other government institutes could avoid setting overlapping and conflicting standards.[764]
- Third, the Reform sought to establish a feedback and evaluation mechanism for standards enforcement, which the government can then timely review, maintain, and update standards.[765]
- The Reform finally asked to improve the diversity, representativeness, and fairness of (S)TCs.[766]

V. Case Study: TD-SCDMA Standard

The final section of this chapter analyzes China's TD-SCDMA standard, serving as an example of how state-driven standards are developed in China's standardization system.[767] The indigenously developed TD-SCDMA standard received nearly the maximum amount of state support and is considered crucial for national development and security.[768] The Chinese government also protected the standard for an extended period of time by delaying awarding licenses to two other competing 3G standards in its domestic market, WCDMA and CDMA 2000 standards.[769] The standard consequently received enormous attention in

---

[763] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China). *See also* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 15-16 (2014).

[764] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[765] Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China),

[766] *Id.*

[767] *See* DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 35 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[768] *Id.* at 38-39. *See also* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 76-77 (2011).

[769] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 73 (2011), Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825(2012), Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case*

the media and academic research.[770] It remains controversial whether this China-developed TD-SCDMA standard is a success or failure.[771] However, together with the government's efforts, the background and process of developing this indigenous standard may clarify how the Chinese standardization system works in operation.

A. Background and Development

During the 1G and 2G eras, China had no indigenous standard or core technology, and was disadvantaged as a result.[772] Heavily dependent on foreign tehnology and locked into the existing 2G network, Chinese domestic corporations paid for at least 10 billion RMB patent royalties as a result.[773] Recognizing European firms' success in the GSM standard and Qualcomm's benefits earned from the CDMA standard, Chinese leadership sought to duplicate these success stories by developing an indigenous standard in 3G telecommunication technology, the TD-SCDMA standard.[774] Given this backdrop, the TD-SCDMA standard was aimed to develop homegrown technology and SEPs, thereby freeing Chinese firms from reliance on dominant foreign standards and their expensive SEP royalties.[775] The standard was also expected to earn overseas revenue as a competitive international standard adopted in global commerce.[776] A fundamental objective of

---

of Government Support to Domestic Third Generation Cellular Standard, 35(5) TELECOMM. POL'Y 399, 409 (2011), DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 39 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 202 (2010). *See* Chapter 2 for further discussion regarding the three 3G telecommunication standards and their evolution.

[770] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 68 (2011).

[771] *Id.* at 68-69, DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[772] *See* Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 822-824 (2012), ZHANG JIHONG (张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 188 (2011), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 186-187 (2010).

[773] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 69-70 (2011), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 186 (2010).

[774] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 42-43 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[775] *Id.* at 43, DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 69 (2011).

[776] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 43 (2013), *available at*

developing the TD-SCDMA standard was to compete with the dominant WCDMA and CDMA-2000 standards, which evolved from the GSM and CDMA standards respectively.[777]

In 1995, MOST, Ministry of Posts and Telecommunications ("MOPT," later known as MIIT) and State Planning Commission ("SPC," later known as NDRC) made the homegrown 3G standard a key project in China's *Ninth Five-year Plan.*[778] The indigenous TD-SCDMA standard was jointly developed by the Siemens and Chinese Academy of Telecommunication Technology ("CATT"), which were established in 1957 by the MOPT and given the mission to develop advanced technologies for China's telecommunication industry.[779] The standard was then commercialized and distributed by Datang Telecom Technology & Industry Group ("Datang"), an entity which had separated from CATT and became established as a state-owned enterprise ("SOE") in September 1998.[780]

The standard was proposed in June 1998 to the International Telecommunications Union ("ITU") as a candidate for 3G telecommunication standards, and accepted as one of the three international 3G standards by the ITU in May 2000 and 3rd Generation Partnership Project ("3GPP") in March 2001.[781] It was not until January 2009 did China officially lauch its 3G mobile services in its domestic market.[782] The government ultimately awarded a TD-SCDMA license to China Mobile, a CDMA 2000 license to China Telecom, and a WCDMA license to China Unicom.[783] It took the TD-SCDMA standard another eight years of

---

http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[777] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 69 (2011).

[778] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 42 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[779] Id. at 42, DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 69 (2011), Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 828 (2012).

[780] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 73 (2011), Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 403 (2011), DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 42 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[781] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 817 (2012).

[782] Id., Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 399 (2011).

[783] Jooyoung Kwak, Heejin Lee & Do Bum Chung, *The Evolution of Alliance Structure in China's Mobile Telecommunication Industry and Implications for International Standardization*, 36(10-11) TELECOMM. POL'Y 966, 969 (2012), Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 399 (2011), ZHANG JIHONG (张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE

development before it was formally launched in 2009.[784] The 3G mobile services in China was implemented six or seven years after the same services became available in other countries.[785]

The following Table 4-6 shows the timeline of key 3G and TD-SCDMA events. Prior to the formal lauch of China's 3G services in 2009, there were four major events that happened in the development of the TD-SCDMA standard:[786]

- The Xiangshan Mountain Meeting in January 1998, discussing whether the TD-SCDMA standard should be proposed to the ITU as a candidate for 3G standards;
- The formulation of the TD-SCDMA Industry Alliance ("TDIA") in 2002 in order to entice corporations to build up the TD-SCDMA value chain;
- The initiation of large-scale TD- SCDMA Network Application Trial project in 5 Chinese cities in February 2006; and
- The meeting in May 2008, organized by MIIT to request China Mobile take more effective actions in commercializing the TD-SCDMA standard.

JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 188 (2011).

[784] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 43 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[785] *Id.*

[786] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 820-821 (2012).

Table 4-6: Chronology of TD-SCDMA Developing Process

Time	Key 3G and TD-SCDMA events
1992	The idea for 3G was first conceived at the World Administrative Radio Conference
1997.4	ITU called for 3G proposals
1998.1	Xiangshan Mountain Meeting discussed how to respond to ITU's call for proposals
1998.6	China submitted to ITU its TD-SCDMA proposal, signed by the Minister and two Vice-Ministers of the Ministry of Information Industries ("MII," the former MIIT)[787]
1998.7	Datang and Siemens signed an agreement to jointly develop TD-SCDMA
1998.9	Datang separated from CATT
2000.5	ITU accepted TD-SCDMA as one of the three 3G standards
2000.12	TD-SCDMA Technology Forum was established in China
2001.3	3GPP accepted TD-SCDMA
2001.4	First test of TD-SCDMA was successfully conducted in Beijing
2001.11	Datang and Siemens signed an agreement to collaborate on TD-SCDMA
2002.2	Datang established Datang Mobile to facilitate TD-SCDMA development and commercialization
2002.10	MII allocated 155 MHz spectrum for TD-SCDMA and 60 MHz for each CDMA2000 and WCDMA
2002.10	TD-SCDMA Industry Alliance was established by eight domestic vendors
2003.11	Motorola released a TD-SCDMA module library for the MRC6011 Reconfigurable Compute Fabric (RCF) device
2004.4	The Chinese government organized MTNet test to verify the capability of TD-SCDMA system to be deployed as a standalone network
2005.3	The Chinese government organized a TD-SCDMA Industrialization Special Test to verify the commercial readiness of TD-SCDMA equipment
2006.1	The Chinese government announced TD-SCDMA as the national technology standard for the telecommunication industry
2006.2	Large-scale TD-SCDMA Network Application Trial project rolled out in five Chinese cities, and extended to ten cities including Beijing, Shanghai, and Guangzhou in 2007
2006.8	SK Telecom signed a memorandum of understanding with NDRC to help China develop TD-SCDMA
2008.4	China Mobile made a ''soft launch'' of 3G services based on TD-SCDMA standard in ten cities such as Beijing, Shanghai, Tianjin, Shenzhen, and Qingdao
2008.5	MIIT organized a small scale meeting to request that China Mobile take active actions to promote TD-SCDMA
2008.8	3G services offered to Beijing Olympic Games through only TD-SCDMA standard
2009.1	China awarded a TD-SCDMA license to China Mobile, a CDMA 2000 license to China Telecom, and a WCDMA license to China Unicom
2010.10	TD-LTE ADVANCED was accepted as a candidate for 4G standards

Source: Xudong Gao & Jianxin Liu, p.820, Nir Kshetri, Prashant Palvia & Hua Dai, p.403

[787] MII incorporated the former government ministries of MOPT and Ministry of Electronic Industry. MII was then renamed MIIT in 2008. GILLIAN YOUNGS, DIGITAL WORLD: CONNECTIVITY, CREATIVITY AND RIGHTS 46 (2013).

B. Standardization Development

1. Role of Government

As indicated in the above Table 4-6, the Chinese government assumed a leading role in developing and promoting the TD-SCDMA standard. Several events point to the government's favor, even a clear bias, toward implementing the China-developed standard.[788]

One such event was in January 2006, where MII formally endorsed the TD-SCDMA standard as a national standard for the Chinese telecommunication industry.[789] Prior to selecting TD-SCDMA as China's national standard, MII had already allocated 155 MHz spectrum for TD-SCDMA as compared to 60 MHz for each CDMA2000 and WCDMA in October 2002.[790] The Chinese government undoubtedly demonstrates a clear bias in support of the development of TD-SCDMA.[791] The government's support could be generally qualified in the aspects of financial, administrative, technical, and signaling support.[792]

a Financial Support

The Chinese government provided enormous financial support to the development of the TD-SCDMA standard.[793] In particular, the government made large grants and loans available to Datang and China Mobile to develop and roll out the TD-SCDMA standard and service.[794]

- For instance, in 1995, the MOST, MOPT, and SPC sponsored a total of 25 million RMB to help develop the TD-SCDMA standard.[795]
- In 2002, the NDRC, MII, and MOST funded 700 million RMB to facilitate TDIA's formulation and operation.[796] The project asked Datang to establish TDIA with seven other Chinese domestic corporations as founding members, including Huawei, ZTE, Potevio, and

---

[788] Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 399 (2011).
[789] *Id.*, Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 820 (2012).
[790] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 820 (2012), Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 399, 403 (2011).
[791] Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 399 (2011).
[792] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012).
[793] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 38-39 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014). *See also* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 76-77 (2011).
[794] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 38 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).
[795] ZHANG JIHONG (张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 188 (2011).
[796] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012).

Lenovo.[797] Part of the funding was used for TDIA's members to pay Datang's TD-SCDMA technology, lowering the entry barriers to developing technology and products.[798]

b Administrative Support

In addition to selecting TD-SCDMA as the national standard and allocating special funding for its implementation, the Chinese government also provided administrative support to the development of its own indigenous standard.[799] Most of these administratve supports occurred after the government announced that TD-SCDMA was now the national standard for the Chinese telecommunication industry in January 2006.[800]

- In February 2006, the government commenced the Large-scale TD-SCDMA Network Application Trial project, and requested that telecommunication service providers support the project, which was rolled out in five Chinese cities.[801]
- One year later, these providers were requested again to support TD-SCDMA by implementing pre-commercialization trials in ten cities, including Beijing, Shanghai, and Guangzhou.[802]
- In April 2008, China Mobile was requested to offer TD-SCDMA service based on its pre-commercialization network during the Beijing Olympic Games.[803]
- The government delayed awarding 3G licenses to the service providers until January 2009 when the TD-SCDMA standard became mature and competitive.[804]

c Technical Support

The Chinese government also provided technical support through its state-funded research institutes to support the development of the TD-SCDMA standard.[805] For instance, MII organized the MTNet test to verify the capability of the TD-SCDMA system to be deployed as a standalone network

---

[797] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 73 (2011).

[798] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012).

[799] *See id.*, DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 73 (2011), Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 399 (2011).

[800] *See* Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012).

[801] *Id.*

[802] *Id.*

[803] *Id.*, Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 408 (2011).

[804] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 73 (2011), Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012), Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 409 (2011), DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 39 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 202 (2010).

[805] *See* Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012).

in April 2004.[806] The China Academy of Telecommunication Research ("CATR"), affiliated with MII at the time, implemented the MTNet test project.[807]

d Signaling Support

The participation of China's top agencies signaled the government's support for the TD-SCDMA standard and its future.[808] One examples of this outward demonstration can be seen in the NDRC, the most powerful government agency in China.[809] The NDRC's strong support of TDIA clearly showed the government's preferred treatment of the TD-SCDMA standard.[810] This policy helped attract Datang's competitors, such as Huawei and ZTE, to join the industry alliance, increasing the credibility of Datang and the standard itself.[811]

2. Role of the Private Sector

China's TD-SCDMA standard was developed under a typical Chinese standardization system: a top-down, government-centered, technology-oriented approach.[812] Unlike the WCDMA and CDMA 2000 standards, the TD-SCDMA standard did not evolve from existing 2G standards.[813] Because of its indigenous origins, many Chinese enterprises were suspicious of the standard's potential and future success in the industry.[814] Initially, the standard could only rely on a narrow industry support base, consisting primarily of a handful of Chinese SOEs and research institutes.[815] Considering the issue of standard implementation and market development, the government sponsored the development of TDIA in order to commercialize the TD-SCDMA standard.[816] TDIA's formulation and development could to some extent demonstrate how the Chinese government

---

[806] *Id.*

[807] *Id*. CATR's predecessor was the China Academy of Posts and Telecommunications, established in 1957 and affiliated with MOPT. CATR later became affiliated with MIIT, which was when MII was renamed to MIIT in 2008. CATR was then renamed the China Academy of Information, Communications and Technology ("CAICT") in 2014. CATR or CAICT was founded to undertake research regarding China's communication policies, telecommunication standards, and communication industry development. *See* CHINA ACAD. OF INFO. COMMC'N & TECH., INTRODUCTION, *available at* http://www.catr.cn/yw/intro/201305/t20130522_923241.htm (last visit date: Apr. 4, 2016).

[808] *See* Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012), ZHANG JIHONG (张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 189-190 (2011), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 201-202 (2010).

[809] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825 (2012).

[810] *Id.*

[811] *Id.*

[812] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 72 (2011).

[813] *See* Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 823-824 (2012).

[814] *See id.*

[815] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 77 (2011).

[816] *See id.* at 72-73.

adjusted its standardization model after entering the globalization era and recognizing the complexity of forming indigenous standards.[817]

As a SOE and spin-off company from CATT, Datang was asked by the Chinese government to lead the formulation of TDIA with seven other domestic equipment manufacturers.[818] TDIA had close connections with the NDRC's Department of Hi-Tech Industry and possessed the mandate to define strategies and policies in developing TD-SCDMA standard.[819] Table 4-7 shows the evolution of TDIA. The member firms initially consisted of eight members in October 2002, and later to 14 members in December 2003, and then 25 members by the end of 2005.[820] Almost five years after TDIA's formation, a variety of corporations joined the industry alliance.[821] These 48 corporations formed a nascent TD-SCDMA value chain in 2007.[822] In July 2008, China Mobile became the first and the only telecommunication service provider member in the alliance, and the total members at the time had reached 58.[823] In February 2010, the first overseas service provider, SK Telcom from Korea, joined the alliance, and the total number of members reached 78.[824] In 2016, TDIA consisted of 90 members, which is composed of various device manufacturers, service providers, software firms, research institutes.[825]

Table 4-7:Evolution of TDIA and Its Value Chain

Time	No. of Members	Description
2002.10	8	These founding members consisted mainly of equipment manufacturers
2003.12	14	Several IC and intelligent antenna manufacturers joined TDIA
2005.4	21	Several handset manufacturers and measurement device firms joined TDIA
2005.11	25	Some handset manufacturers joined TDIA
2006.5	29	Some measurement device firms joined TDIA
2007.6	48	Various kinds of firms joined TDIA and a nascent TD-SCDMA value chain formed
2008.7	58	China Mobile joined TDIA and was the only service provider
2009.6	66	TD application software firms joined TDIA
2010.2	78	TDIA for the first time accepted a foreign service provider as a member
2011.1	84	TIDA for the first time accepted a research institute or university as a member

Source: Xudong Gao & Jianxin Liu, p.826

[817] *See id.* at 72, 77.
[818] *Id.* at 73.
[819] *Id.* at 77-78.
[820] Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825-826 (2012).
[821] *Id.* at 826.
[822] *Id.*
[823] *Id.* at 825-826.
[824] *Id.*
[825] *Id.* at 826, TELECOMM. DEV. INDUS. ALLIANCE, ABOUT US, *available at* http://www.tdia.cn/en/about.asp (last visit date: Apr. 4, 2016).

Most of TDIA members are Chinese domestic corporations, because TDIA requires its members to share IP.[826] Not many global multinational corporations ("GMNCs") joined and supported TDIA, which led the alliance to have a limited technological capacity to develop the TD-SCDMA standard.[827] More importantly, the decision power of TDIA appeared largely to have been shaped by the NDRC and MIIT agencies, together with China Mobile and a small group of SOEs, such as Datang and Potevio.[828] Under these circumstances, TDIA remains a relatively closed organization, with limited influence from outsiders, particularly from foreign corporations.[829]

C. Evaluation of the Indigenous Standard

It has been over 20 years since the Chinese government started developing the TD-SCDMA standard in 1995. The 4G network has also been around since 2010, and may soon replace 3G mobile services.[830] It is therefore now an appropriate opportunity to evaluate the performance and development of China's domestically developed TD-SCDMA.[831]

1. Indigenous Objective

One of the primary goals of developing the TD-SCDMA standard was to create indigenous technology that could then produce indigenous SEPs.[832] This objective could potentially free Chinese domestic firms from relying on foreign standards and their high SEP royalties.[833] Backed by the govnernment's near-maximum financial support, the TD-SCDMA standard is considered the most strategic of China's unique standards in safeguarding China's economic development and national security.[834] Interestingly though, Nokia, Ericsson, and Siemens respectively possess 32%, 23%, and 11% of the SEPs in the TD-SCDMA standard.[835] The leading developer, Datang, only

---

[826] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 78 (2011).

[827] GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 202 (2010).

[828] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 79 (2011).

[829] *Id.*

[830] *See* JUHA KORHONEN, INTRODUCTION TO 4G MOBILE COMMUNICATIONS 26 (2014).

[831] *See also* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 68-69 (2011), Pierre Vialle, Junjie Song & Jian Zhang, *Competing with Dominant Global Standards in a Catching-up Context. The Case of Mobile Standards in China,* Telecommunications Policy, 36(10-11) TELECOMM. POL'Y 832, 832 (2012).

[832] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 69 (2011).

[833] *See id.* at 69-70, DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 43 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 186 (2010).

[834] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 69 (2011), DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37-39 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[835] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit

possesses less than 9% of the SEPs.[836] As a result, the China-developed TD-SCDMA standard continues to embed large amounts of SEPs owned by foreign corporations.[837] Consequently, this project has not achieved its primary objective to diversify indigenous technology and increase domestically-held SEPs.

2. Quality of Technology

In addition, the TD-SCDMA standard was intended to function as a worldwide competitive standard, thereby helping China earn overseas revenues in the global market.[838] However, as with other China-developed standards, the TD-SCDMA standard has not been widely adopted outside the Chinese market or adopted at all in many cases.[839] Of graver consequence, China Mobile's implementation of the standard harms the firm's relative market position in telecommunication services.[840] China Mobile's market share in 3G services is far lower than its extremely dominant position in 2G services.[841] Chinese consumers perceive the 3G services provided by China Mobile's competitors as more reliable and less prone to bugs.[842] China Telecom and China Unicom had adopted the CDMA 2000 and WCDMA standards respectively instead of the TD-SCDMA standard.[843] Were it not for the government's huge investment in the standard, the standard may have never pushed through to market.[844] Ironically, government officials that pushed the standard in the first

---

date: Sep. 27, 2014), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 216 (2010).

[836] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), GAO JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] 216 (2010).

[837] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[838] *Id.* at 43.

[839] *Id.* at 37. *See also* Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 400 (2011).

[840] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[841] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37, footnote 31 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[842] *Id.*, interview with CNUNI-6, 2015.

[843] Jooyoung Kwak, Heejin Lee & Do Bum Chung, *The Evolution of Alliance Structure in China's Mobile Telecommunication Industry and Implications for International Standardization*, 36(10-11) TELECOMM. POL'Y 966, 969 (2012), Nir Kshetri, Prashant Palvia & Hua Dai, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399, 399 (2011), ZHANG JIHONG (张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] 188 (2011).

[844] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37, footnote 32 (2013), *available at*

place now consider the efforts made in TD-SCDMA a huge waste of time and resources, as China moved to 4G services in 2013.[845] Many agenices and SOEs that used to support the TD-SCDMA standard now avoid the standard as much as possible.[846] Despite these negative responses to developing the TD-SCDMA standard, China still learned a lot from its work on developing its indigenous standard.[847] The accumulated experience afforded China a valuable and solid foundation for developing future technology standards, including its 4G telecommunication standards.[848]

3. State-led Benefit

China's standardization system operates on a top-down, government-centered model.[849] State-led standardization in theory seems efficient and may quickly improve the national economy.[850] However, in the case of the TD-SCDMA standard, the standard's development demonstrates the problems found in a traditional and typical Chinese standardization system. Table 4-8 describes the behavior of the Chinese government during three different periods. In the beginning when developing the standard, the Chinese government used a coalition of CATT and SOEs as main carriers.[851] Because of inter-agency rivalries within the government and conflicting interests of major stakeholders, the government had much ambiguity and intermittence in developing the standard.[852] It relied much on Datang's lobbies to the Chinese government and its top leaders so that the standard could eventually continue developing.[853]

Agency conflicts and the resulting policy intermittence may have been the reason why the TD-SCDMA standard took such a long time to develop, even though it received the ITU's approval in 1999.[854] It may also explain why the 3G services experienced such a delay before entering the Chinese market in 2009.[855] Given this case study of TD-SCDMA, it seems clear that state-led

---

http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014). *See also* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 76 (2011).

[845] DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 37, footnote 32 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[846] *Id*., interview with CNUNI-6, 2015.

[847] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 75-77, 85-86 (2011).

[848] *See id.* This development of telecommunication standards is similar with China's development of the national economy, both of which have the characteristic of "crossing the river by feeling the stones" (*mozhe shitou guohe* 摸着石头过河).*See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 5.

[849] DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 53-54, 72 (2011).

[850] *See also id.* at 13.

[851] *Id.* at 73.

[852] *See id.*, Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 825-828 (2012).

[853] *See* Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 817, 824-826 (2012).

[854] *See* DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 43 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).

[855] *See id.*

standardization was not very efficient. Rather, as highlighted in the case of TD-SCDMA's development, the conflict among different agencies and stakeholders only harmed standardization development and consumer welfare.

Table 4-8:Behavior of the Chinese Government in Developing the TD-SCDMA Standard

Timing	Decision context and characteristics
1997-2000	1. MII was a key decision maker 2. Indigenous Innovation had not yet become a national strategy 3. Most people were against proposing the TD-SCDMA standard to the ITU during the Xiangshan Mountain Meeting 4. China became strongly supportive of the TD-SCDMA standard after deciding to propose the standard to the ITU
2001-2005	1. More government ministries became involved in developing the TD-SCDMA standard; the NDRC, MII, and MOST were key decision makers and the NDRC assumed a leading role 2. China hotly debated the necessity of making Indigenous Innovation a national strategy 3. Different agencies held diverse perspectives; the NDRC was very supportive. 4. China had no systematic plan in developing the TD-SCDMA standard 5. China had limited experience and knowledge in supporting the standard
2006-2009	1. Upon Datang's lobby, China's top governmental leaders intervened and then various agencies took the TD-SCDMA development more seriously 2. Indigenous Innovation ultimately became China's national strategy, although it was problematic to implement, such as a lack of effective coordination among agencies 3. Developing the TD-SCDMA standard focused more on commercialization, rather than technology testing

Source: Xudong Gao & Jianxin Liu, p.828

As a whole, the Chinese government appears to have only limited success in developing the TD-SCDMA project, despite its incredible financial investment and efforts.[856] However, the project at least allows China to have a good foundation to transition from 3G to 4G technology, which may then help its industry and corporations to compete in 4G telecommunication services.[857] More importantly, the government has gained invaluable experience in developing the TD-SCDMA standard and recognizes the current problems existing in its standardization system. The experience and self-awareness of its problems may help China improve its standardization system, thereby increasing China's capacity to compete in global standard-setting.

VI. Conclusion

This chapter summarized China's standardization system and was followed by a case study of the TD-SCDMA standard. The discussion section provided historical background under which the system was established and later evolved to fit societal and economic development in China. After introducing China's standardization legislation, the chapter then discussed the primary standard-

[856] *See also* Pierre Vialle, Junjie Song & Jian Zhang, *Competing with Dominant Global Standards in a Catching-up Context. The Case of Mobile Standards in China,* Telecommunications Policy, 36(10-11) TELECOMM. POL'Y 832, 832 (2012).

[857] *See* DIETER ERNST, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY 72, 75-76 (2011).

setting institutions under the PRC central and local governments. The following section then described the ongoing reform of the country's existing standardization system. The final section used the TD-SCDMA standard as a case study to demonstrate how the Chinese homegrown standard was developed and evaluated, highlighting problems in China's current standardization system.

The PRC has had less than 70 years to develop its standardization system. The system was formulated under a planned economy and under the influence of the Soviet Union. China then experienced a series of developments in terms of modernization, open market reform, and participation in the WTO. Despite these developments, the Chinese standardization system retained characteristics of a planned economy, and these traits did not change significantly as time went by. The government tended to use the standardization system as the State's tool to strategically improve its national economy, domestic industry, and social environment. Using the standardization system as the State's machine, the government consequently recruited numerous employees and invested in enormous resources for standardization development. As of 2015, the government has developed over 100,000 national, industrial, and local standards in total.

Because standardization continues to resemble a system in a planned economy, China's standardization system remains highly centralized. The Chinese central and local governments lead standardization development. These central and local governments administer the standards, as well as formulate and research standards. Under China's standardization administration system, the SAC under AQSQI is the primary institute charged with the responsibility of developing national standards. Under State Council, different ministries develop industry standards in various industries. Local governments take primary responsibility for developing local standards. The SAC, ministries, and local governments mentioned above not only have their own affiliated standardization research institutes as their think-tanks, but also have their own TCs and STCs to help formulate standards. Despite the TCs and STCs aimed at diversity for innovation, TCs and STCs are now under the control of research institutes funded by the government. Because Chinese society still considers standards as public property and Chinese research institutes still own much more innovation capacity than the general private enterprise, the government controls this arena.

In recent years, the government has gradually come to the realization that its standardization system is not well suited for Chinese industries that are upgrading or domestic enterprises that are innovating. China also recognizes that because its standardization system is led by different levels of government that do not communicate with one another, these standards often engender problems in overlapping, conflicts, and low-quality standards. To remedy this, the government established the *Strengthening Standardization Reform* in 2015. The Reform both regulates and deregulates at the same time. On the one hand, the Reform reviews and refines current redundant standards in the Chinese standardization system. It also plans to simplify the standardization system to merely four categories of standards: national mandatory standards, national voluntary standards, industrial voluntary standards, and local voluntary standards. On the other hand, the Reform authorized industry associations to establish association standards. Given this new legal capacity, the private sector can now have greater access to participating in China's standard-setting. Moreover, the private sector is also expected to help the government develop voluntary industrial standards. Under these circumstances, the design of the association standards may potentially encourage more innovation by the market and the private sector, which benefits the development of Chinese standards and domestic industry.

The Chinese government invested many resources into developing its TD-SCDMA telecommunication standard in 1995. This process entailed a series of administrative, financial, and

technical supports to help the domestically developed standard become a globally competitive one. Recognizing the significance of market players and industrial value chains, the government funded and requested its SOEs to form an industrial alliance. Despite these efforts at the top and bottom, the government experienced limited success in its project with the TD-SCDMA standard, failing to achieve its indigenous objective. In addition, the project hardly provided satisfying technological performance, as well as confronted conflicts arising from the state-led standardization. The costs of this project made the government realize the challenges and complexity of developing a homegrown standard in such a competitive global market. In addition, the experience helped the government understand the difficulty and problems of ultilizing its traditional standardization system in its opening market economy.

On all accounts, the Chinese standardization system is moving towards a hybrid state-controlled/market-driven system. As of this writing, it remains uncertain whether the ongoing Reform will work well and whether the system will ultimately reach a final stage. However, the only certainty is that the Chinese standardization system will continue to evolve just as the current Chinese economy is evolving. How the reform impacts standardization in China deserves additional observation on its efficacy and future impact on global commerce. Chapter 7 discusses the impact of an evolving Chinese standardization system on market competition between Chinese and American economies.

Chapter 5 SEP Regulations in the United States

I. Introduction

This chapter will provide an overview of U.S. law applicable to standard essential patents ("SEPs"). U.S. law governing SEPs comes in a variety of forms including judicial decisions, administrative agency decisions, and administrative agency guidance. As of this writing, the United States Congress has not enacted any legislation concerning SEPs. However, some government agencies have established guidelines or policy statements on SEP. For example, in 2007, the United States Department of Justice ("DOJ") and Federal Trade Commission ("FTC") issued guidelines entitled Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition (hereafter "DOJ and FTC 2007 Guidelines").[858] In 2013, the DOJ and the United States Patent and Trademark Office ("USPTO") issued the Policy Statement for Standards-Essential Patents Subject to Voluntary F/RAND Commitments (hereinafter "DOJ and USPTO 2013 Policy Statement").[859] In many areas of economic activity, U.S. administrative agencies issue regulations, but this has not been done in the area of SEPs. In this area, U.S. administrative agencies have issued guidelines or policy statement providing information about enforcement policies, as opposed to an administrative decision for a specific case or a formal regulation. Although these guidelines or policy statement lack the authority of formal decisions or regulations, they still provide important information about how U.S. law governing SEPs will be applied.

The following Table 5-1 summarizes sequentially the recent regulations that exist concerning SEPs in the United States.

[858] U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION (2007).
[859] U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS (2013).

Table 5-1: Evolving SEP Regulations in the United States

Year	Name	Administrative		Legislative	Judicial Decision	Issue		
		Decision	Guideline			Antitrust	Injunction	Damages
1996.5	*In re Dell*[i]	X				X		
2005.7	*In re Union Oil Co. of Cal*[ii]	X				X		
2006.8	*In re Rambus*[iii]	X				X		
2006.10	VITA Business Review Letter[iv]	X				X		
2007.4	IEEE Business Review Letter[v]	X				X		
2007.4	DOJ and FTC 2007 Guidelines[vi]		X			X		
2007.9	*Broadcom v. Qualcomm*[vii]				X	X		
2008.4	*Rambus v. FTC*[viii]				X	X		
2008.12	*Qualcomm v. Broadcom*[ix]				X	X		
2009.3	*Hynix v. Rambus*[x]				X	X		
2012.6	FTC 2012 Statement[xi]	X					X	
2012.9 (2015.7)	*Microsoft v. Motorola*[xii]				X		X	
2013.1	DOJ and USPTO 2013 Policy Statement[xiii]		X				X	
2013.4 (2015.7)	*Microsoft v. Motorola*[xiv]				X			X
2013.5	*Realtek v. LSI*[xv]				X		X	
2013.8	Presidential Veto[xvi]	X					X	
2013.9	*In re Innovatio*[xvii]				X			X
2014.4	*Apple v. Motorola*[xviii]				X		X	
2014.12	*Ericsson v. D-Link*[xix]				X			X
2015.12	*CSIRO v. Cisco*[xx]				X			X

i. *In re Dell*, 121 F.T.C. 616 (1996) (No. C-3658), *available at* http://www.ftc.gov/system/files/documents/cases/960617dellconsentorder.pdf (last visit date: April 16, 2015).
ii. Decision and order, *In re Union Oil Co. of Cal.*, No. 9305 (F.T.C. July 27, 2005), *available at* http://www.ftc.gov/sites/default/files/documents/cases/2005/08/050802do.pdf (last visit date: April 16, 2015).
iii. 2006 FTC LEXIS 60 (F.T.C. Aug. 2, 2006).
iv. Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Robert A. Skitol, Drinker, Biddle & Reath, LLP (2006), *available at* http://www.justice.gov/atr/public/busreview/219380.pdf (last visit date: April 16, 2015).
v. Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Michael A. Lindsay, Dorsey & Whitney LLP (2007), *available at* http://www.justice.gov/atr/public/busreview/222978.pdf (last visit date: April 16, 2015).
vi. U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION (2007).
vii. Broadcom Corp. v. Qualcomm, Inc., 501 F.3d 297 (3rd Cir. 2007).
viii. Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).
ix. Qualcomm Inc. v. Broadcom, Corp., 548 F.3d 1004 (Fed. Cir. 2008).
x. Hynix Semiconductor, Inc. v. Rambus, Inc., 609 F. Supp. 2d 988 (N.D. Cal. 2009).
xi. U.S. FED. TRADE COMM'N, THIRD PARTY UNITED STATES FEDERAL TRADE COMMISSION'S STATEMENT ON THE PUBLIC INTEREST (2012), *available at* https://www.ftc.gov/sites/default/files/documents/advocacy_documents/ftc-comment-united-states-international-trade-commission-concerning-certain-wireless-communication/1206ftcwirelesscom.pdf (last visit date: April 16, 2015).
xii. Microsoft Corp. v. Motorola, Inc., 696 F.3d 872 (9th Cir. Wash. 2012), Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015).
xiii. U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO

VOLUNTARY F/RAND COMMITMENTS (2013).
xiv. Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015).
xv. Realtek Semiconductor Corp. v. LSI Corp., 946 F. Supp. 2d 998 (N.D. Cal. 2013).
xvi. THE U.S. TRADE REPRESENTATIVE, EXEC. OFFICE OF THE PRESIDENT, DISAPPROVAL OF THE U.S. INTERNATIONAL TRADE COMMISSION'S DETERMINATION IN THE MATTER OF CERTAIN ELECTRONIC DEVICES, INCLUDING WIRELESS COMMUNICATION DEVICES, PORTABLE MUSIC AND DATA PROCESSING DEVICES, AND TABLET COMPUTERS, INVESTIGATION NO. 337-TA-7941 (2013), *available at* https://ustr.gov/sites/default/files/08032013%20Letter_1.PDF (last visit date: April 16, 2015).
xvii. In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013).
xviii. Apple Inc. v. Motorola, Inc.,110 U.S.P.Q.2D 1695 (Fed. Cir. Apr. 25, 2014).
xix. Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014).
xx. Commonwealth Sci. & Indus. Research Organisation v. Cisco Sys., 809 F.3d 1295 (Fed. Cir. Dec. 3, 2015).

Source: Compiled by the author

As seen in Table 5-1, SEP disputes in the United States can generally be divided into two groups: one includes decisions made before 2010 and the other includes decisions made after 2010. Before 2010, most SEP disputes dealt with antitrust issues. Prior to the 2008 D.C. Circuit decision *Rambus v. FTC*,[860] the main issue was whether federal antitrust agencies could (or should) intervene in SEP disputes.[861] Before 2010, these disputes were generally treated as matters of public interest. However, following the D.C. Circuit decision rendered in *Rambus v. FTC*, the main issue shifted to whether antitrust claims can be argued in private patent infringement lawsuits.[862]

After 2010, the focus of SEP regulations changed to remedy issues in private patent litigation. The first remedy issue was whether courts would grant SEP holders injunctive relief against those implementing standards under the holder's fair, reasonable, and non-discriminatory ("FRAND") commitment to standard-setting organizations ("SSOs").[863] The dispute over injunctive relief also discussed in terms of whether the United States International Trade Commission ("ITC") would grant exclusionary orders to SEP holders.[864] The second remedy issue focused on damages. Many recent judicial decisions have addressed how courts should determine reasonable royalties because of the FRAND commitment.[865]

The following discussion will follow the historical progression of SEP issues—antitrust, injunction, calculation of damages—in analyzing the legal issues of SEPs.

- The first section will discuss the issue of public antitrust intervention. Because SEPs influence market competition by way of exploiting their exclusive rights, it is necessary to discuss in advance how governments use antitrust regulations to intervene in market competition.[866]

---

[860] Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).
[861] *See, e.g.,* 2006 FTC LEXIS 60 (F.T.C. Aug. 2, 2006), Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).
[862] *See, e.g.,* Qualcomm Inc. v. Broadcom, Corp., 548 F.3d 1004 (Fed. Cir. 2008), Hynix Semiconductor, Inc. v. Rambus, Inc., 609 F. Supp. 2d 988 (N.D. Cal. 2009).
[863] *See, e.g.,* Microsoft Corp. v. Motorola, Inc., 696 F.3d 872 (9th Cir. Wash. 2012), Apple Inc. v. Motorola, Inc., 110 U.S.P.Q.2D 1695 (Fed. Cir. Apr. 25, 2014).
[864] *See, e.g.,* THE U.S. TRADE REPRESENTATIVE, EXEC. OFFICE OF THE PRESIDENT, DISAPPROVAL OF THE U.S. INTERNATIONAL TRADE COMMISSION'S DETERMINATION IN THE MATTER OF CERTAIN ELECTRONIC DEVICES, INCLUDING WIRELESS COMMUNICATION DEVICES, PORTABLE MUSIC AND DATA PROCESSING DEVICES, AND TABLET COMPUTERS, INVESTIGATION NO. 337-TA-7941 1 (2013), *available at* https://ustr.gov/sites/default/files/08032013%20Letter_1.PDF (last visit date: April 16, 2015).
[865] *See, e.g.,* Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015), Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014).
[866] *See also* Research in Motion Ltd. v. Motorola, Inc., 644 F. Supp. 2d 788, 790-791 (N.D. Tex. 2008).

- The second section will analyze the issue of injunctive relief and exclusion orders in private patent disputes. Because injunctive relief and exclusion orders exclude infringers from making, using, and selling SEPs or any relevant products, they may be the most attractive remedy for SEP holders.[867]
- The final section focuses on the measure of damages issue in private patent infringement litigation. Unlike the antitrust and injunction issue which are now regarded as largely settled, the issue of the measure of damages has now become a widely debated issue. How the Court determines what reasonable royalties are will be an important indicator of SEP's value in the future.[868] Determining reasonable royalties for SEP is therefore significant to SEP holders, (potential) SEP infringers, and technology standard implementers.

II. Antitrust Intervention

Standard-setting organizations (SSOs) may request their members to disclose potential SEPs and commit FRAND licenses in order to alleviate the hold-up problem.[869] However, SSO members may intentionally deceive SSOs into incorporating their patented technology by making false representations about their patents. SSO members may then threaten patent infringement suits against those producing standard-compliant products after standard-specific investments are made.[870] Alternatively, SSO members may convince SSOs to adopt their patented technology by falsely promising that they will license on FRAND terms.[871] This deceptive practice regarding disclosure or FRAND commitment potentially excludes rivals from market competition and allows firms to unlawfully acquire monopoly power.[872] This deceptive practice raises significant antitrust challenges.

Antitrust law began in the United States with the *Sherman Act* which was first enacted in 1890.[873] In the beginning, U.S. antitrust laws arose under three short provisions from two federal statutes: Section 1 and 2 of the *Sherman Act*, and Section 7 of the *Clayton Act* enacted in 1914.[874] Section 1 of the *Sherman Act* prohibited unreasonable conspiracies, while Section 2 of the Act prohibited unreasonable monopolization.[875] Section 7 of the *Clayton Act* prohibited unreasonable trade-restraining acquisitions.[876] Since then, two other major antitrust statutes have been enacted: the *Federal Trade Commission Act* of 1913 and the *Robinson-Patman Act* of 1936.[877] The former created the FTC, an independent competition enforcement agency, and the latter limited the seller's freedom to discriminate against buyers.[878] Throughout its lengthy history, U.S. antitrust laws have

[867] *See* MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 834 (3d ed. 2009).
[868] *See Id.*
[869] U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 7, 36 (2007).
[870] AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING, 117-118 (2d ed. 2011).
[871] *Id.* at 118.
[872] *Id.*
[873] ELEANOR M. FOX, CASES AND MATERIALS ON U.S. ANTITRUST IN GLOBAL CONTEXT 6-8 (3d ed. 2012).
[874] CHRISTOPHER L. SAGERS, EXAMPLES AND EXPLANATIONS: ANTITRUST 3 (2d ed. 2014).
[875] *Id.* at 3-4.
[876] *Id.* at 4.
[877] *Id.*
[878] *Id.*

been enforced by both administrative agencies and private parties.[879] The antitrust enforcement agencies include two federal agencies (the FTC and the DOJ) and state governments.[880]

The intersection of antitrust law and intellectual property law has been controversial almost since the beginning of antitrust law.[881] To clarify the law in this area, U.S. antitrust enforcers have issued guidelines to explain their enforcement policies to interested parties. In addition to the DOJ and FTC 2007 Guidelines mentioned above, the DOJ and FTC issued the Antitrust Guidelines for the Licensing of Intellectual Property in 1995.[882] U.S. courts have also dealt with IP issues in key antitrust cases.[883] The impact of these agency guidelines and judicial decisions has been to prevent IP owners from monopolizing markets. In other words, acquiring patent protection does not necessarily mean conferring market dominance to patentees.[884]

In that vein, the United States government generally does not intervene in SEP disputes through its antitrust laws. As seen in Table 5-2, this approach in SEP disputes has developed slowly over time. From 1996 to 2009, the government moved towards a hands-off approach with antitrust intervention in SEP disputes. In addition, since the initial antitrust regulations were administrative, the regulations were developed by federal antitrust agencies (i.e. the FTC or DOJ). Eleven years after the first SEP administrative decision in 1996, the DOJ and FTC issued their 2007 Guidelines. These guidelines were so influential that they resembled an administrative agency regulation in impact. After that, most antitrust disputes moved to the courts, and antitrust agencies issued no further guidance concerning SEP issues.

Table 5-2: Evolving Antitrust Disputes in SEP in the United States

Year	Name	Administrative		Legislative	Judicial Decision
		Decision	Guideline (statement)		
1996.5	*In re Dell*	X			
2005.7	*In re Union Oil Co. of Cal*	X			
2006.8	*In re Rambus*	X			
2006.10	VITA Business Review Letter	X			
2007.4	IEEE Business Review Letter	X			
2007.4	DOJ and FTC 2007 Guidelines		X		
2007.9	*Broadcom v. Qualcomm*				X
2008.4	*Rambus v. FTC*				X
2008.12	*Qualcomm v. Broadcom*				X
2009.3	*Hynix v. Rambus*				X

Source: Compiled by the author

[879] CHRISTOPHER L. SAGERS, EXAMPLES AND EXPLANATIONS: ANTITRUST 4, 8, 9 (2d ed. 2014), ELEANOR M. FOX, CASES AND MATERIALS ON U.S. ANTITRUST IN GLOBAL CONTEXT 57 (3d ed. 2012).
[880] CHRISTOPHER L. SAGERS, EXAMPLES AND EXPLANATIONS: ANTITRUST 9 (2d ed. 2014), ELEANOR M. FOX, CASES AND MATERIALS ON U.S. ANTITRUST IN GLOBAL CONTEXT 57 (3d ed. 2012).
[881] *See, e.g.,* Richard A. Posner, *Antitrust in the New Economy*, 68, ANTITRUST L.J. 925 (2001).
[882] U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINE FOR THE LICENSING OF INTELLECTUAL PROPERTY (1995).
[883] *See, e.g.,* Image Tech. Serv. v. Eastman Kodak Co., 125 F.3d 1195 (9th Cir. Cal. 1997), CSU, L.L.C. v. Xerox Corp. (In re Independent Serv. Orgs. Antitrust Litig.), 203 F.3d 1322 (Fed. Cir. 2000), Tool Works Inc. v. Indep. Ink, Inc., 126 S. Ct. 1281 (U.S. 2006).
[884] *See* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINE FOR THE LICENSING OF INTELLECTUAL PROPERTY 4 (1995).

The following subsection reviews these evolving administrative agency decisions, administrative agency guidance, and judicial decisions. The final subsection summarizes the recent developments in these evolving antitrust regulations in the United States.

A. Administrative Agency Decisions, Guidance

1. In re Dell (1996)

The FTC issued its first administrative decision in 1996. *In re Dell* involved an abuse of the standards-setting process by patent holder, Dell Corporation.[885] In February of 1992, Dell participated in the Video Electronics Standards Association ("VESA"), an SSO composed of computer hardware and software manufacturers.[886] In 1991 and 1992, VESA developed a standard for VESA Local Bus ("VL-bus"), a mechanism to transfer instructions between a computer's central processing unit and its peripherals.[887] During the standard-setting process, VESA asked its members to certify whether they had any intellectual property rights ("IPRs") conflicting with the proposed VL-bus standard; Dell certified twice that it had no such IPRs.[888]

The FTC filed a complaint asserting that after VESA adopted the standard, Dell subsequently claimed that VESA's implementation violated Dell's 5,036,481 (the "'481 patent").[889] Dell received the '481 patent in July 1991, just seven months before it joined VESA.[890] At no time during the standard-setting activities did Dell disclose the existence of the '481 patent.[891] The FTC consequently alleged in the complaint that Dell had unreasonably restrained competition, violating Section 5 of the *FTC Act*.[892]

Dell ultimately entered into a consent agreement with the FTC.[893] The FTC then issued a consent order that prohibited Dell from enforcing its '481 patent against any computer manufacturers using the VL-bus standard.[894] The FTC stated this remedy was consistent with cases decided under equitable estoppel theories in which courts precluded patent-holders from enforcing patents when they failed to disclose the existence of the patent.[895] Even though this equitable estoppel issue could have been resolved by way of private litigation alone, the FTC asserted that

---

[885] *In re Dell*, 121 F.T.C. 616, 627 (1996) (No. C-3658), *available at* http://www.ftc.gov/system/files/documents/cases/960617dellconsentorder.pdf (last visit date: April 16, 2015).

[886] *Id.* at 617.

[887] *Id.* at 616, 624, 627.

[888] *Id.* at 624.

[889] *Id.* at 617, 628.

[890] *Id.* at 617.

[891] *Id.*

[892] The FTC alleged that Dell had restrained competition in the following ways: "(a) Industry acceptance of the VL-bus design standard was hindered because some computer manufacturers delayed their use of the design standard until the patent issue was clarified. (b) Systems utilizing the VL-bus design standard were avoided due to concerns that patent issues would affect the VL-bus' success as an industry design standard. (c) The uncertainty concerning the acceptance of the VL-bus design standard raised the costs of implementing the VL-bus design as well as the costs of developing competing bus designs. (d) Willingness to participate in industry standard-setting efforts have been chilled." *Id.* at 618.

[893] *Id.* at 623.

[894] *Id.* at 616.

[895] *Id.* at 624-625.

based on Section 5 of the *FTC Act*, there were sufficient grounds to find that Dell's activities caused a likelihood of consumer harm.[896]

2. In re Union Oil Co. of Cal. (2005)

The *In re Union Oil Co. of Cal. ("Unocal")* case is another FTC case resulting in a consent order. The case involved Unocal's subversion of low-emissions, reformulated gasoline standards in state regulatory standard-setting proceedings.[897] These gasoline standards were initiated by the California Air Resources Board ("CARB") in the late 1980s to address the state's serious air pollution problems.[898] In 2003, the FTC complained that Unocal actively participated in the CARB rulemaking process and engaged in a pattern of bad-faith, deceptive conduct and exclusivity, and that this conduct undermined competition and harmed consumers, violating Section 5 of the *FTC Act*.[899]

The FTC complained that Unocal, through its willful misrepresentations and other deceptive conduct, had created and maintained a materially false and misleading impression that it did not possess, or would not enforce, any relevant IPRs that could undermine the CARB reformulated gasoline standards.[900] But for this fraud, CARB would not have adopted the eventual standards that substantially overlapped with Unocal's concealed patents, and the terms on which the Unocal could later enforce its proprietary interests would have been substantially different.[901] Moreover, Unocal did not announce its existing proprietary interests and patents relevant to the standards until shortly before CARB's Phase 2 regulations were to go into effect.[902] By that time, the refining industry had spent billions of dollars in modifying their refineries to comply with the standards.[903] Thus, Unocal's deception was alleged to have threatened or caused actual anticompetitive effects.[904]

After a dismissal by the administrative law judge and then a reversal by the full Commission, the *Unocal* case was finally settled as part of a larger dual consent agreement that allowed Chevron Corporation to acquire Unocal.[905] Entering the same settlement terms in the *Dell* case, the *Unocal* case ultimately resulted in enforcement of Unocal's patents related to the CARB reformulated gasoline standards being blocked.[906]

---

[896] *Id.* at 626.

[897] Complaint, *In re Union Oil Co. of Cal.*, p.1, No. 9305 (F.T.C. Mar. 4, 2003), *available at* http://www.ftc.gov/sites/default/files/documents/cases/2003/03/030304unocaladmincmplt.pdf (last visit date: April 16, 2015).

[898] *Id.*

[899] *Id.*

[900] *Id.* at 2.

[901] *Id.*

[902] *Id*. at 3.

[903] *Id.*

[904] The FTC alleged that Unocal's deception caused the following anticompetitive effects: "(a) increased royalties (or other payments) associated with the use of technology to refine, produce, and supply low emissions, reformulated gasoline for the California market; (b) increases in the price of low emissions, reformulated gasoline . . . ; (c)reductions in the manufacture, output, and supply of low emissions, reformulated gasoline . . . ; and (d)decreased incentives, on the part of refiners, blenders, and importers, to produce and supply low emissions, reformulated gasoline . . ." *Id.*

[905] U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 45 (2007).

[906] Decision and order, *In re Union Oil Co. of Cal.*, p.3, No. 9305 (F.T.C. July 27, 2005), *available at* http://www.ftc.gov/sites/default/files/documents/cases/2005/08/050802do.pdf (last visit date: April 16, 2015).

3. In re Rambus (2006)

In re Rambus is the FTC's most important SEP case to date, entered on the docket by a unanimous FTC.[907] Rambus Corporation is a developer and licensor of dynamic random access memory ("DRAM") technologies.[908] For more than four years during the 1990s, Rambus participated as a member of the Joint Electron Device Engineering Council ("JEDEC") SSO.[909] Rambus was accused of deceiving the other JEDEC members through a course of deceptive conduct.[910]

Specifically, Rambus was accused of having refused to disclose its existing patents and pending applications, depriving the other JEDEC members of important information necessary to evaluate potential standards.[911] The corporation also misled other members into believing that it did not seek patents that would cover implementation of the standards considered by JEDEC.[912] Through its participation in JEDEC, Rambus obtained information regarding the pending standard, amending its patent applications to ensure that subsequently-issued patents would cover the ultimate standard.[913] Thus, Rambus could strategically (even opportunistically) conceal its patents and applications until after the standards were adopted and the market was locked in.[914] Rambus was eventually accused of distorting the standard-setting process of the JEDEC organization and engaging in the anticompetitive "hold-up" of the DRAM industry.[915]

The FTC concluded that Rambus engaged in exclusionary conduct that significantly contributed to its acquisition of monopoly power in four relevant technology markets (latency, burst length, data acceleration, and clock synchronization technology).[916] By hiding the potential that Rambus could impose royalty obligations of its own choosing, and by silently using the JEDEC to assemble a patent portfolio to cover the ultimate SDRAM and DDR SDRAM standards, Rambus's deceptive conduct significantly contributed to JEDEC's choice of Rambus's technologies.[917] Since JEDEC incorporated Rambus's technology into its DRAM standards and failed to secure assurances regarding future royalty rates, these factors significantly contributed to Rambus's acquisition of monopoly power.[918] As a result, the FTC decided that Rambus' deceptive conduct constituted exclusionary conduct under Section 2 of the *Sherman Act*, and that Rambus unlawfully monopolized the markets for the four technologies incorporated into the JEDEC DRAM standards in violation of Section 5 of the *FTC Act*.[919]

The 120-page *In re Rambus* opinion was a landmark decision where the FTC intervened to respond to the "hold-up problem."[920] However, in 2008, this decision was reversed by the D.C.

---

[907] Broadcom Corp. v. Qualcomm, Inc., 501 F.3d 297, 311 (3rd Cir. 2007).
[908] 2006 FTC LEXIS 60, 1 (F.T.C. Aug. 2, 2006).
[909] *Id.* at 2.
[910] *Id.* at 2, 5.
[911] *Id.* at 5.
[912] *Id.* at 5, 6.
[913] *Id.* at 6.
[914] *Id.*
[915] *Id.* at 2.
[916] *Id.* at 284.
[917] *Id.*
[918] *Id.*
[919] *Id.* at 2.
[920] Broadcom Corp. v. Qualcomm, Inc., 501 F.3d 297, 311 (3rd Cir. 2007). *See* Chapter 2 for further discussion of the hold-up problem.

Circuit in *Rambus v. FTC*.[921] The circuit court concluded that Rambus' deceptive conduct was insufficient to cause an exclusionary impact because the FTC could not show that Rambus' deception caused the JEDEC to adopt Rambus's technology as opposed to any other technology.[922] Thus, the only loss associated with Rambus' deceptive conduct was the failure to secure a FRAND commitment.[923] This failure only raised the price of license fees but did not diminish competition, so it was beyond the reach of antitrust law.[924] Therefore, after *Rambus v. FTC*, the FTC faced greater difficulty in addressing "hold-up problems" by using the *Sherman Act* or the *FTC Act*.

4. VITA Business Review Letter (2006)

In addition to the three FTC administrative decisions mentioned above, the Department of Justice (DOJ) also issued two landmark decisions in 2006 and 2007. As opposed to the FTC's active investigation and strict antitrust enforcement, the DOJ passively approved the SSOs' proposed patent policy with a less rigorous analysis of the antitrust issues. The DOJ's first decision was its business review letter to the VMEbus International Trade Association ("VITA") SSO, which was accredited by the American National Standards Institute ("ANSI").[925]

The SSO is composed of vendors and users of real-time modular embedded computing systems based on the VME computer architecture (a standard set of physical plugs and logical protocols).[926] It requested a statement of the DOJ's antitrust enforcement intentions with respect to VITA's proposed patent policy. The policy was designed to ensure that participants in the standard-setting process disclosed patents that were essential to implementing a new standard and declaring the most restrictive licensing terms that would be required to license any such patents.[927] These licensing terms included the maximum royalty rates and the most restrictive non-royalty terms.[928]

Responding to VITA's request, the DOJ concluded that unless the standard-setting process is used as a sham to cloak naked price-fixing or bid rigging, it would analyze actions taken during the standard-setting process under rule of reason.[929] The DOJ analyzed VITA's proposed patent policy under rule of reason, examining both the policy's expected competitive benefits and its potential to restrain competition.[930] The DOJ eventually approved the license terms (with the maximum royalty rates and most restrictive non-royalty terms) in VITA's proposed patent policy.[931] In the history of

---

[921] Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).
[922] *Id.* at 466.
[923] *Id.*
[924] *Id.* at 464.
[925] *See* Chapter 3 for further discussion regarding the ANSI's accreditation.
[926] Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Robert A. Skitol, Drinker, Biddle & Reath, LLP (2006), p.1-2, *available at* http://www.justice.gov/atr/public/busreview/219380.pdf (last visit date: April 16, 2015).
[927] *Id.* at 1.
[928] *Id.* at 4.
[929] *Id.* at 8.
[930] *Id.*
[931] In the VITA business review letter, the DOJ held that: "The disclosure of each patent holder's most restrictive licensing terms would allow working group members to evaluate substitute technologies on both technical merit and licensing terms. Working group members are likely to use this information when deciding which technologies to include in the standard. This use likely will create incentives for each patent holder to compete by submitting declarations that will increase the chances that its patented technology will be selected. The proposed policy should not permit licensees to depress the price of licenses for patented technologies through joint action because it prohibited any joint negotiation or discussion of licensing terms among the working group members or with third parties at all VSO and working group meetings. Moreover,

U.S. antitrust enforcement, the DOJ and FTC have generally been quite sensitive and cautious about issues related to pricing. Thus, the approval of the license terms (particularly the maximum royalty rates) in the letter can be considered a milestone, where the agencies started to relax their antitrust scrutiny of SSOs and SEPs. This lower level of intervention may lead SSOs and their members to have greater discretionary power inside organizations and may reduce concerns about government intervention.

5. IEEE Business Review Letter (2007)

In 2007, the DOJ issued a similar administrative decision to its VITA business review letter with another SSO, the Institute of Electrical and Electronics Engineers, Inc. ("IEEE"). The IEEE's technical interests cover the fields of aerospace systems, computers, telecommunications, biomedical engineering, electric power, and consumer electronics.[932] In the case, IEEE decided to change its policy to give patent holders the option of publicly disclosing and committing to the most restrictive licensing terms (which may include the maximum royalty rate) they would offer for patent claims found to be essential to the standard.[933] Under this change, IEEE working group members would also be allowed to discuss within certain limits the relative costs and benefits of alternative technologies within technical standard-setting meetings.[934] In preparation, IEEE requested a statement of the DOJ's antitrust enforcement intentions with respect to a proposed patent information policy.[935]

Once again, the DOJ analyzed and considered whether the competitive effects of standard-setting activities were reasonable, considering whether the standard-setting process was used as a sham to cloak price fixing or bid rigging.[936] The DOJ examined both the expected competitive benefits of the proposed policy and its potential to restrain competition.[937] It eventually approved the license terms in IEEE's proposed patent policy.

Regarding the expected benefits of the policy, the DOJ stated that disclosing and committing to the most restrictive licensing terms would allow SSO members to make more informed decisions during the standard-setting process because the members could compare alternative technologies based on differences in cost and technical merit.[938] The increased predictability of licensing terms could also lead to faster development, implementation, and adoption of a standard, as well as fewer litigated disputes after a standard was set.[939] But, considering the potential restraint in competition, the DOJ indicated that the proposed policy prohibited discussion of specific licensing terms within standards development meetings, even though it permitted voluntary commitments to the most

---

working group members will not set actual licensing terms. The patent holder and each prospective licensee will negotiate separately, subject only to the restrictions imposed by the patent holder's unilateral declaration of its most restrictive terms. . . Any efforts to reduce competition by using the declaration process as a cover to fix downstream prices of VME products would be a *per se* violation of section 1 of the Sherman Act, . . . The same would be true of efforts by patent owners to rig their declarations of licensing terms." *Id.* at 9-10.

[932] Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Michael A. Lindsay, Dorsey & Whitney LLP (2007), p.1, *available at* http://www.justice.gov/atr/public/busreview/222978.pdf (last visit date: April 16, 2015).

[933] *Id.* at 4.

[934] *Id.* at 4-5.

[935] *Id.* at 1.

[936] *Id.* at 9.

[937] *Id.*

[938] *Id.* at 10.

[939] *Id.*

restrictive licensing terms.[940] The DOJ also emphasized that it would challenge under Section 1 of the *Sherman Act* any effort to use the proposed policy as a cover to fix downstream pricing, as well as any efforts to rig the declarations of licensing terms.[941]

6. DOJ and FTC 2007 Guidelines (2007)

In 2007, the DOJ and FTC issued their guidelines, entitled Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition. The Guidelines are based on the Antitrust Guidelines for the Licensing of Intellectual Property issued in 1995.[942] Chapter 2 of the Guidelines addresses the "patent hold-up" competition concern, which is when patents are incorporated into collaboratively developed standards. The Guidelines inform interested parties of the enforcement policies of the agencies. In the absence of formal administrative agency regulations issued after notice-and-comment rulemaking, the Guidelines have been used by interested parties as a de facto substitute for formal administrative agency regulations.

The Guidelines begin by stating that the DOJ's and FTC's intention is to decrease their antitrust intervention in the IP field. The introduction emphasizes the same fundamental and compatible goals of IP and antitrust law.[943] According to the Guidelines, these two laws should be perceived as complementary bodies that work together to benefit consumers.[944] Because of the existence of substitutive technology and products, IP does not necessarily create monopolies, and the antitrust doctrine should not presume the existence of market power relating to IP.[945] Under these circumstances, the government should shift away from and stop using antitrust intervention to mediate or balance IP's exclusive rights.[946]

In Chapter 2, the DOJ and FTC describe their anti-competition concerns, indicating that SSO members may fail to disclose their SEPs during the standard-setting process. They reiterate their antitrust concerns as well. The position iterated is consistent with the FTC's decision in *In re Union Oil* and *In re Rambus*.[947] Chapter 2 next addresses *ex ante* negotiation of licensing terms by SSO

---

[940] *Id.* at 11. The proposed policy also prohibited standard setters from discussing the price at which standardized products would be sold. *Id.*

[941] *Id.*

[942] U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 3 (2007).

[943] *Id.* at 1.

[944] *Id.*

[945] *Id.* at 2. *See also* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINE FOR THE LICENSING OF INTELLECTUAL PROPERTY 4 (1995).

[946] The Guideline's beginning statement writes: "Over the past several decades, antitrust enforcers and the courts have come to recognize that intellectual property laws and antitrust laws share the same fundamental goals of enhancing consumer welfare and promoting innovation. This recognition signaled a significant shift from the view that prevailed earlier in the twentieth century, when the goals of antitrust and intellectual property law were viewed as incompatible: intellectual property law's grant of exclusivity was seen as creating monopolies that were in tension with antitrust law's attack on monopoly power. Such generalizations are relegated to the past. Modern understanding of these two disciplines is that intellectual property and antitrust laws work in tandem to bring new and better technologies, products, and services to consumers at lower prices." U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 1 (2007).

[947] Chapter 2 states: ". . . whether an SSO member harms competition by failing to disclose, or by engaging in deceptive conduct regarding, the existence of intellectual property rights during the standard-setting process and later alleging that implementation of the standard infringes that member's IP, and thus, requires a license and the payment of royalties. The FTC has alleged violations of section 5 of the Federal Trade Commission Act

participants. In the Guidelines, the DOJ and FTC hold positions consistent with the DOJ's business review letters in 2006 and 2007. The position holds that *ex ante* negotiation may have potential procompetitive benefits and that the DOJ and FTC will evaluate this conduct under rule of reason. However, the Guidelines mention that the *ex ante* negotiation raises much greater anti-competition concerns, even *per se* condemnation, because this negotiation might relate to price-fixing and might change (non-)price information.[948] In the history of the *Sherman Act*, it is clear that all negotiations related to price are highly sensitive and may be considered *per se* unlawful.[949] Therefore, under the Guidelines, it seems clear that the DOJ and FTC have decreased their antitrust intervention policies regarding price-fixing in the standard-setting process.[950]

Finally, except for disclosure and *ex ante* negotiation issues, the Guidelines did not discuss antitrust liability when SSO members fail to license SEPs on FRAND license terms. Consequently, FRAND license commitments were later addressed by the following judicial decisions.

B. Judicial Decisions

1. Broadcom v. Qualcomm (3rd Circuit 2007)

The *Broadcom v. Qualcomm* case broke new ground because no court or agency had decided before whether the breach of FRAND commitments violated antitrust law.[951] In the case, Broadcom alleged that Qualcomm (patentee) induced the European Telecommunications Standards Institute ("ETSI") and other SSOs to include its proprietary technology in the Universal Mobile Telecommunications System ("UMTS") standard by falsely agreeing to abide by the SSOs' IP policies, but then intentionally breaching that agreement by licensing its technology on non-FRAND terms.[952] Broadcom alleged that the intentional acquisition of monopoly power through deception of an SSO violated Section 2 of the *Sherman Act*.[953]

In the decision, the court reiterated the previous three FTC decisions regarding the breach of the duty of disclosure.[954] The court relied heavily on the FTC's analysis in *In re Rambus*, emphasizing the notion that deception is a traditional and conventional antitrust concern, and

---

in three matters involving such conduct in different factual settings, and the Commission recently found a violation of section 5 in one of these proceedings, following a full adjudicative trial." *Id.* at 36-37.

[948] *Id.* at 53, AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING, 105 (2d ed. 2011).

[949] *See, e.g.,* United States v. Socony-Vacuum Oil Co., 310 U.S. 150 (U.S. 1940).

[950] In the Guidelines, the DOJ and FTC clearly state that: ". . . whether *ex ante* negotiation of licensing terms by SSO participants constitutes a *per se* violation of section 1 of the Sherman Act because competitors would be acting jointly to negotiate licensing terms with each of the firms whose technology may be considered for inclusion in the SSO's standard. In the Agencies' view, a *per se* approach fails to recognize that negotiating licensing terms during the standard-setting process may increase competition between technologies that are being considered for inclusion in a standard. In light of these potential procompetitive benefits, the Agencies would generally expect to apply the rule of reason to evaluate conduct such as multilateral *ex ante* licensing negotiations or SSO requirements to disclose model licensing terms." U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 37 (2007), ". . . joint *ex ante* activity to establish licensing terms as part of the standard-setting process will not warrant per se condemnation. Such activity might mitigate the potential for IP holders to hold up those seeking to use a standard by demanding licensing terms greater than they would have received before their proprietary technology was included in the standard. Given the strong potential for procompetitive benefits, the Agencies will evaluate joint ex ante negotiation of licensing terms pursuant to the rule of reason." *Id.* at 55-56.

[951] Broadcom Corp. v. Qualcomm, Inc., 501 F.3d 297, 313 (3rd Cir. 2007).

[952] *Id.* at 304.

[953] *Id.*

[954] *Id.* at 310-312.

equating the intentional creation of deceptive FRAND commitments with deceptive nondisclosure of IPRs.[955] The court eventually ruled that Qualcomm had violated the Section 2 of the *Sherman Act*.[956]

2. Rambus v. FTC (D.C. Circuit 2008)

In 2008, the D.C. Circuit reversed the FTC decision in *In re Rambus*, relying heavily on *Broadcom v. Qualcomm* as precedent.[957] The Court reversed the decision because Rambus' deceptive conduct was not significant enough to have an exclusionary impact.[958] The FTC also conceded in its remedial opinion that there was insufficient evidence that JEDEC would have standardized other technologies had it known the full scope of Rambus's patents.[959] The D.C. Circuit emphasized that the critical question was whether Rambus engaged in exclusionary conduct, and thereby acquired its monopoly power in the relevant markets unlawfully.[960] Because of this, the focus of the antitrust scrutiny changed, placing focus on the resulting harms to competition instead of the deception itself.[961] The FTC's decision was ultimately reversed because the FTC failed to demonstrate that Rambus' conduct was exclusionary.

The court noted that Rambus' deception merely caused the JEDEC to fail to obtain Rambus' FRAND license commitment.[962] This failure only resulted in higher prices (rather than exclusionary impact), which did not violate antitrust law. The D.C. Circuit ruled that "even if deception raises the price secured by a seller, but does so without harming competition, it is beyond the antitrust laws' reach."[963] Relying on *NYNEX v. Discon*,[964] the Court also stated that "an otherwise lawful monopolist's use of deception simply to obtain higher prices normally has no particular tendency to exclude rivals and thus to diminish competition."[965] The D.C. Circuit emphasized the distinction between deception that results in higher prices but not exclusion on the one hand (actions which is immunized under *NYNEX v. Discon*) and deception that harms competition by excluding rivals and results in the acquisition of monopoly power over the other.[966]

---

[955] AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING, 120 (2d ed. 2011).
[956] The court held that: "(1) in a consensus-oriented private standard-setting environment, (2) a patent holder's intentionally false promise to license essential proprietary technology on FRAND terms, (3) coupled with an SDO's reliance on that promise when including the technology in a standard, and (4) the patent holder's subsequent breach of that promise, is actionable anticompetitive conduct. This holding follows directly from established principles of antitrust law and represents the emerging view of enforcement authorities and commentators, alike. Deception in a consensus-driven private standard-setting environment harms the competitive process by obscuring the costs of including proprietary technology in a standard and increasing the likelihood that patent rights will confer monopoly power on the patent holder. *See Rambus, No. 9302, 2006 FTC LEXIS 60 at *161* (holding that 'distorting [the SDO's] technology choices and undermining [SDO] members' ability to protect themselves against patent hold-up . . . caused harm to competition'). Deceptive FRAND commitments, no less than deceptive nondisclosure of IPRs, may result in such harm." Broadcom Corp. v. Qualcomm, Inc., 501 F.3d 297, 314 (3rd Cir. 2007).
[957] Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).
[958] AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING, 121 (2d ed. 2011).
[959] Rambus, Inc. v. FTC, 522 F.3d 456, 464 (D.C. Cir. 2008), AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING, 121 (2d ed. 2011).
[960] Rambus, Inc. v. FTC, 522 F.3d 456, 463 (D.C. Cir. 2008).
[961] *Id.* at 464.
[962] *Id.*
[963] *Id.,* AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING, 121 (2d ed. 2011).
[964] NYNEX Corp. v. Discon, Inc., 525 U.S. 128 (1998).
[965] Rambus, Inc. v. FTC, 522 F.3d 456, 464 (D.C. Cir. 2008).
[966] AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING, 121 (2d ed. 2011).

This rationale also led the D.C. Circuit to highlight a possible tension between its view of *NYNEX v. Discon* and that of the Third Circuit in *Broadcom v. Qualcomm*.[967] Even if *Broadcom v. Qualcomm* was not the case at issue, the Third Circuit in *Broadcom v. Qualcomm* relied heavily on the FTC's *In re Rambus* decision (FTC's landmark decision).[968] In *Rambus v. FTC*, the D.C. Circuit reversed the FTC's *In re Rambus* decision, and made clear its view that antitrust law would not extend to deceptive conduct that merely raises prices.[969] After this case, the validity and applicability of *Broadcom v. Qualcomm* was significantly undermined.[970]

Finally, the D.C. Circuit also reviewed the evidence supporting the FTC's complaint under Section 5 of the *FTC Act*.[971] The court expressed serious concerns about the strength of the evidence that the FTC relied on to support some of its crucial findings on the scope of JEDEC's patent disclosure policies and Rambus's alleged violation of those policies.[972] The court stated that the FTC should not take an aggressive interpretation of what was rather weak evidence in *In re Rambus*.[973] As a result, the standard of proof to intervene in SEP disputes increased for the FTC.

Rambus v. FTC was the beginning of the United States government's hands-off approach towards intervention in SEP disputes based on antitrust concerns. Before *Rambus v. FTC*, SEP disputes in courts or the FTC were concerned with antitrust enforcement. Prior to 2008, the FTC tended to intervene in SEP disputes through its antitrust regulation, and the court tended to favor the FTC's decision. However, in *Rambus v. FTC*, the D.C. Circuit raised the standard of proof for the FTC to apply antitrust law to SEP disputes, requesting substantial evidence to support the FTC's antitrust intervention. Thus, it would become more difficult for the antitrust agencies to intervene in SEP disputes related to standard-setting processes.

After *Rambus v. FTC,* the focus of SEP disputes has turned to the breach of disclosure duties as a defense in private patent infringement lawsuits, as it has become difficult to argue antitrust complaints and request that antitrust agencies mediate SEP disputes. A representative case is the following *Qualcomm v. Broadcom*, a decision made after *Rambus v. FTC*.[974] Similar to the *Rambus* situation, Qualcomm breached its duty to disclose its patents in the standard-setting process. Broadcom successfully argued in defense that Qualcomm's breach was an implied waiver and equitable estoppel, rather than an antitrust violation.

---

[967] *Id.*
[968] *Id.* at 120.
[969] *Id.* at 122.
[970] The court mentioned in the decision that: "While the Commission's brief doesn't mention *NYNEX*, much less try to distinguish it, it does cite *Broadcom Corp. v. Qualcomm Inc., 501 F.3d 297 (3d Cir. 2007)*, which in turn had cited the Commission's own 'landmark' decision in the case under review here, . . . To the extent that the ruling (which simply reversed a grant of dismissal) rested on the argument that deceit lured the SSO away from non-proprietary technology, . . . it cannot help the Commission in view of its inability to find that Rambus's behavior caused JEDEC's choice; to the extent that it may have rested on a supposition that there is a cognizable violation of the Sherman Act when a lawful monopolist's deceit has the effect of raising prices (without an effect on competitive structure), it conflicts with *NYNEX."* Rambus, Inc. v. FTC, 522 F.3d 456, 464 (D.C. Cir. 2008).
[971] *Id.* at 467.
[972] *Id.*
[973] *Id.*
[974] Qualcomm Inc. v. Broadcom, Corp., 548 F.3d 1004 (Fed. Cir. 2008).

3. Qualcomm v. Broadcom (Federal Circuit 2008)

This patent infringement case involved the consequence of silence in the face of a duty to disclose patents in an SSO.[975] The district court concluded that Qualcomm breached its duty to disclose U.S. Patent Nos. 5,452,104 ("'104 Patent") and 5,576,767 ("'767 Patent") to the Joint Video Team ("JVT") SSO.[976] The district court ruled that Qualcomm impliedly waived these patents, and Broadcom could argue equitable estoppel.[977] As a remedy, the district court ordered the '104 and '767 Patents (and related patents) unenforceable against the world.[978]

On appeal, the Federal Circuit affirmed that Qualcomm had breached its duty to disclose the patents.[979] The Court also affirmed that it was within the district court's authority, sitting as a court of equity, to determine that Qualcomm's misconduct fell within the doctrine of waiver.[980] It also agreed that Broadcom was entitled to a remand with respect to equitable estoppel.[981] However, the scope of the remedy for unenforceability as applied to the world was too broad.[982] Thus, the Federal Circuit vacated the unenforceability judgment and remanded with instructions to enter an unenforceability remedy limited in scope to standard-compliant products.[983]

The case affirmed that breaching the duty to disclose SEPs may be used by defendants as a defense in patent infringement cases. However, the court may restrict this defense's impact on the SEP holder to balance the SEP holder's benefits. In the following case of *Hynix v. Rambus*, the ruling court limited the circumstances in which this defense could be raised.[984] The court raised the standard of proof for the defendant (Hynix), so that the defendant could not easily raise the defense in a patent infringement case.

4. Hynix v. Rambus (N.D. Cal. 2009)

This patent and antitrust litigation involved DRAM interface technology patented by Rambus and incorporated into DRAM standards.[985] Rambus attempted to assert its patent claims against manufacturers of DRAMs that complied with the JEDEC standard.[986] Hynix alleged that Rambus obtained its patents in violation of a disclosure obligation to members of the JEDEC SSO.[987] In addition to its antitrust complaints, Hynix also raised a number of defenses for infringement, based on Rambus' holdup conduct.[988]

---

[975] *Id.* at 1008.
[976] *Id.*
[977] *See Id.* at 1019-1024.
[978] *Id.* at 1008.
[979] *Id.* at 1008, 1027.
[980] *Id.* at 1022.
[981] *Id.* at 1024.
[982] *Id.* at 1027.
[983] *Id.* at 1008. The court held that: "Accordingly, based on the district court's findings, the broadest permissible unenforceability remedy in the circumstances of the present case would be to render the '104 and '767 Patents (and their continuations, continuations-in-part, divisions, reissues, and any other derivatives thereof) unenforceable against all H.264-compliant products (including the accused products in this case, as well as any other current or future H.264-compliant products). Accordingly, we vacate the unenforceability remedy and remand with instructions to enter an unenforceability remedy limited in scope to any H.264-compliant products." *Id.* at 1026.
[984] Hynix Semiconductor, Inc. v. Rambus, Inc., 609 F. Supp. 2d 988 (N.D. Cal. 2009).
[985] *Id.* at 990.
[986] *Id.*
[987] *Id.*
[988] *Id.*

By distinguishing the case-at-issue from *Qualcomm v. Broadcom,* the court discussed a strict standard of proof for the alleged defendant (Hynix) to raise its defenses with success.[989] And only when the defendant meets this strict standard (i.e. clear disclosure policy in SSO, clear expectation among SSO members, intentionally concealing conduct of SEP holder) can the company successfully raise the defense in its infringement case. To some extent, this standard of proof restricts the success of defenses such as implied waiver, equitable estoppel, and unenforceability. Even though the standard of proof regarding the defense is evolving, it seems clear that the focus of SEP disputes is moving from antitrust allegations to patent infringement defenses.

C. Antitrsut Intervention Summary

From 1996 to 2009, the law governing SEP contained in administrative agency decisions and judicial decisions changed significantly. Generally speaking, the United States government's antitrust regulations can be divided into the following three periods.

(1) Strong Intervention Period (1996-2006)

During this period, the FTC actively intervened in SEP disputes. The changing FTC administrative decisions (*In re Dell, In re Unocal, In re Rambus*) analyzed whether SEP holders violated their disclosure obligations rather than whether they violated their FRAND license commitments. The rationale in these decisions suggests that the FTC may intervene in FRAND license issues to maintain market competition and consumer protection.

(2) Limited Intervention Period (2006-2007)

From 2006, the DOJ started to loosen its position on intervening in SEP disputes through antitrust regulations. In its VITA and IEEE business review letters, the DOJ considered under the rule of reason these two SSOs' IPR policies that requested SSO members to declare their maximum royalty rates, even though price-fixing had been considered *per se* illegal in the context of the United States' antitrust enforcement history.[990] This loose position was confirmed in the DOJ and FTC 2007 guidelines.[991] The United States federal antitrust agencies began to treat antitrust and IP as complementary forces, not forces in tension.[992]

(3) Hands-off Approach Period (2008 to the Present)

After *Rambus v. FTC* in 2008, the United States government's hands-off position regarding SEP antitrust issues began. The government's position allowed the market to lead, reducing the use of antitrust regulation to interfere with the market's operation. Since 2008, most SEP disputes have

---

[989] The court stated in the decision that: "The instant case is distinguishable from *Qualcomm* in the following material ways. First, the written JEDEC disclosure policies did not clearly require members to disclose information about patent applications and the intent to file applications in the future and there is no indication that members ever legally agreed to do so. . . Second, the jury in this case expressly found that JEDEC members did not share a clearly defined expectation that members would disclose relevant knowledge they had about patent applications or the intent to file patent applications on technology being considered for adoption as a JEDEC standard. . . Third, Qualcomm failed to disclose existing patents which it intentionally concealed. The patent-at-issue in this case had not even been applied for during Rambus's membership in JEDEC." *Id.* at 1026-1027.

[990] *See, e.g.,* United States v. Socony-Vacuum Oil Co., 310 U.S. 150 (U.S. 1940).

[991] *See* U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 1-5 (2007).

[992] ELEANOR M. FOX, CASES AND MATERIALS ON U.S. ANTITRUST IN GLOBAL CONTEXT 554 (3d ed. 2012).

consequently changed from public disputes (against antitrust agencies) to private disputes (against possible patent infringers).

During the period from 1996 to the present, the American government's general position started with strong antitrust intervention with SEP issues, then transitioned to a an approach where intervention was progressively more limited. Under these circumstances, the SEP problem gradually shifted from the main issue being in public antitrust disputes to ones in defense methods within private patent infringement disputes. Later, after the defense standard of proof enhanced in the still evolving *Hynix v. Rambus* case, the focus of most SEP private disputes turned to patent remedy issues. This development might be the primary reason that most damage and injunction decisions (either administrative or judicial) were made after the year 2012.

III. Patent Remedies

A. Injunctive Relief

Since 1952, the United States patent law has been codified as Title 35 of the United States Code.[993] However, the historical antecedent of the United States patent system can be traced back to the seventeenth-century English tradition of granting patents to inventors, a practice which continued in colonial America.[994] The framers of the Constitution gave Congress, in Article I, Section 8, Clause 8, the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[995] This Patent (and Copyright) Clause is the source of patent (and copyright) law in the United States.[996] Besides Congress, which creates laws governing patent rights and enforcement, the United States federal courts also play a significant role in interpreting, supplementing, and rewriting the rules established by Congress.[997]

An injunction is an order by the court commanding the infringer to cease any further infringement (direct, inducing, or contributory) in the United States during the term of the patent.[998] Without this injunctive power of the courts, the right to exclude granted by the patent would be diminished, and the express purpose of the United States Constitution and Congress to promote the progress of the useful arts would be seriously undermined.[999] Prior to the Supreme Court's decision in *eBay v. MercExchange*,[1000] federal courts essentially always granted permanent injunctive relief as a standard part of the final judgment when patent owners prevailed.[1001]

---

[993] MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 1 (3d ed. 2009).
[994] ALAN L. DURHAM, PATENT LAW ESSENTIALS: A CONCISE GUIDE 1 (4th ed. 2013). *See also* MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 9-19 (3d ed. 2009), ROBERT P. MERGES, PETER S. MENELL & MARK A. LEMLEY, INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE 125-130 (5th ed. 2009).
[995] ALAN L. DURHAM, PATENT LAW ESSENTIALS: A CONCISE GUIDE 1 (4th ed. 2013), Bonito Boats v. Thunder Craft Boats, 489 U.S. 141, 146 (U.S. 1989).
[996] ALAN L. DURHAM, PATENT LAW ESSENTIALS: A CONCISE GUIDE 1-2 (4th ed. 2013).
[997] *Id.* at 2.
[998] JANICE M. MUELLER, PATENT LAW 610 (4th ed. 2012). 35 U.S.C. § 283 provides that: "The several courts having jurisdiction of cases under this title may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable."
[999] Smith Int'l, Inc. v. Hughes Tool Co., 718 F.2d 1573, 1578-1579 (Fed. Cir. 1983).
[1000] eBay, Inc. v. MercExchange, L.L.C., 547 U.S. 388 (2006).
[1001] JANICE M. MUELLER, PATENT LAW 611-612 (4th ed. 2012). Because the "right to exclude recognized in a patent is but the essence of the concept of property," the general rule is that a permanent injunction will be

However, in *eBay v. MercExchange*, the Court announced that a permanent injunction was not to be automatically awarded in every case, and a district court's decision to impose or deny a permanent injunction should be made only after consideration of traditional equitable principles.[1002] Thus, in order for a court to grant injunctive relief, a plaintiff must satisfy a four-factor test by demonstrating:

(1) that it has suffered an irreparable injury;
(2) that remedies available at law, such as monetary damages, are inadequate to compensate for the injury;
(3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and
(4) that the public interest would not be disserved by a permanent injunction.[1003]

In addition to the federal courts, the United States International Trade Commission ("ITC") is another institute patent holders can bring patent lawsuits to.[1004] The authority given to the ITC by Section 337 of the Tariff Act of 1930 provides an alternative or complement to traditional patent litigation.[1005] The ITC is an independent, nonpartisan, quasi-judicial federal agency that provides trade expertise to both the legislative and executive branches of the government, determines the impact of imports on the United States' industries, and directs actions against unfair trade practices.[1006] The exclusionary order remedy and the cease-and-desist order remedy—the remedies available to the ITC—are specifically designed to effectively stop unfair acts or methods of competition caused by importers.[1007] These remedies available under Section 337 conceptually resemble the permanent injunctive relief available through the federal district court system.[1008] By statute, the ITC is required to issue an exclusion order upon the finding of a Section 337 violation absent a finding that the effects of one of the statutorily-enumerated public interest factors (the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in United States) counsel otherwise.[1009]

The American systems of permanent injunctions and exclusionary orders was thus established long before the SEP issue arose. The relevant factors to be considered have evolved through court

---

issued once infringement and validity have been adjudged. MercExchange, L.L.C. v. eBay, Inc., 401 F.3d 1323, 1338 (Fed. Cir. 2005).

[1002] JANICE M. MUELLER, PATENT LAW 613 (4th ed. 2012).

[1003] eBay, Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391 (2006).

[1004] Section 337 of the Tariff Act of 1930 (19 U.S.C. §1337) forbids the unlawful "importation into the United States … of articles that … infringe a valid and enforceable United States patent."

[1005] Charles F. Schill, *Chapter 20. Section 337 Litigation Strategies*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 719, 722 (Barry L. Grossman & Gary M. Hoffman ed., 2010).

[1006] *Id.* at 724.

[1007] *Id.* at 732.

[1008] *Id.* at 733. However, *Spansion v. ITC* indicates that: "given the different statutory underpinnings for relief before the Commission in Section 337 actions and before the district courts in suits for patent infringement, this court holds that *eBay* does not apply to Commission remedy determinations under Section 337. The Commission is not required to apply the traditional four-factor test for injunctive relief used by district courts when deciding whether to issue the equitable remedy of a permanent injunction. Unlike the equitable concerns at issue in *eBay,* the Commission's issuance of an exclusion order is based on the statutory criteria set forth in Section 337." Spansion, Inc. v. ITC, 629 F.3d 1331, 1359 (Fed. Cir. 2010). *See also* U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS footnote 1 (2013).

[1009] Spansion, Inc. v. ITC, 629 F.3d 1331, 1358 (Fed. Cir. 2010). *See* Charles F. Schill, *Chapter 20. Section 337 Litigation Strategies*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 719, 733 (Barry L. Grossman & Gary M. Hoffman ed., 2010).

decisions or provided for in legislation. However, when the SEP issue began to arise in private disputes rather than public antitrust disputes and to injunctions and exclusion orders, the question of whether the established system (including its rules, such as Section 337 and *eBay* four-factor test) would still be applied in SEP problems became controversial. During the period from 2012 to 2014, both government agencies and courts considered the specific issue of whether to grant SEP holders injunctive relief or an exclusionary order. *See* Table 5-3. Although the first FTC administrative decision was issued in 2012, the first judicial decision issued at approximately the same time.

Table 5-3: Evolving SEP Dispute concerning Injunction (Exclusion Order)

Year	Name	Administrative		Legislative	Judicial Decision
		Decision	Guideline		
2012.6	FTC 2012 Statement	X			
2012.9 (2015.7)	*Microsoft v. Motorola*				X
2013.1	DOJ and USPTO 2013 Policy Statement		X		
2013.5	*Realtek v. LSI*				X
2013.8	Presidential Veto	X			
2014.4	*Apple v. Motorola*				X

Source: Compiled by the author

The following subsections will review these evolving administrative agency decisions, administrative agency guidance, and judicial decisions.

1. Administrative Agency Decision, Guidance

a FTC 2012 Statement (2012)

On June 6, 2012, the FTC submitted a statement in response to the ITC's Notices of Request for Statements on the Public Interest in Investigation Nos. 337-TA-745 and 337-TA-752.1.[1010] The FTC submitted this statement to explain the potential economic and competitive impact of injunctive relief on disputes involving SEPs.[1011] In the statement, the FTC was concerned that a patentee could make a FRAND commitment as part of the standard setting process, and then seek an exclusion order for infringement of the FRAND-encumbered SEP as a way of securing royalties that may be inconsistent with that FRAND commitment.[1012] Thus, even though the FTC recognized the

[1010] U.S. FED. TRADE COMM'N, THIRD PARTY UNITED STATES FEDERAL TRADE COMMISSION'S STATEMENT ON THE PUBLIC INTEREST, 1 (2012), *available at* https://www.ftc.gov/sites/default/files/documents/advocacy_documents/ftc-comment-united-states-international-trade-commission-concerning-certain-wireless-communication/1206ftcwirelesscom.pdf (last visit date: April 16, 2015).

[1011] *Id.* at 2.

[1012] *Id.* The statement indicates that: "After a RAND commitment is made, the patentee and the implementer will typically negotiate a royalty or, in the event they are unable to agree, may seek a judicial determination of a reasonable rate. However, a royalty negotiation that occurs under threat of an exclusion order may be weighted heavily in favor of the patentee in a way that is in tension with the RAND commitment. High switching costs combined with the threat of an exclusion order could allow a patentee to obtain unreasonable licensing terms despite its RAND commitment, not because its invention is valuable, but because implementers are locked in to practicing the standard. . . In these ways, the threat of an exclusion order may allow the holder of a RAND-encumbered SEP to realize royalty rates that reflect patent hold-up, rather than the value of the patent relative to alternatives, which could raise prices to consumers while undermining the standard setting process." *Id.* at 3.

importance of an exclusion order in the patent system, the FTC considered FRAND-encumbered SEPs as a separate issue to that of general patent law and policy, and recommended treating the exclusion order issue in a different way.[1013]

b DOJ and USPTO 2013 Policy Statement (2013)

On January 8, 2013, two executive-branch agencies, the DOJ and the USPTO, issued the *Policy Statement for Standards-essential Patents Subject to Voluntary F/RAND Commitments.* This Policy Statement possessed both legislative and administrative characteristics, in a manner similar to the DOJ and FTC 2007 Guidelines (discussed *supra* ⍰. A. 6). The Policy Statement has a legislative character because it was composed of general principles. The Policy Statement also resembles an administrative regulation, because it was issued by government agencies. The Policy Statement discussed "whether injunctive relief in judicial proceedings or exclusion orders in investigations under Section 337 are properly issued when a patent holder seeking such a remedy asserts SEPs that are encumbered by a RAND or FRAND licensing commitment."[1014] In this Policy Statement, the DOJ and USPTO were concerned that granting an exclusion order to holders of F/RAND-encumbered SEPs might go against the public interest, particularly when considering United States competition conditions and United States consumers. Thus, these two agencies appeared to propose that exclusion orders might not be an appropriate remedy for SEP infringement in ITC proceedings.[1015]

In the 2013 Policy Statement, the DOJ and USPTO took the general position that exclusion orders should not be overused in cases involving SEPs. However, the Policy Statement also illustrated some circumstances where issuing exclusion orders may be appropriate. These circumstances include when putative licensees:

[1013] The statement indicates that "We agree that an appropriately granted exclusion order preserves the exclusivity that forms the foundation of the patent system's incentives to innovate, and the threat of an exclusion order can provide a significant deterrent to infringement. . . RAND-encumbered SEPs present considerably different issues. A RAND commitment provides evidence that the SEP owner planned to monetize its IP through broad licensing on reasonable terms rather than through exclusive use. Consistent with the proper role of the patent system, remedies that reduce the chance of patent hold-up associated with RAND encumbered SEPs can encourage innovation by increasing certainty for firms investing in standards-compliant products and complementary technologies. Such remedies may also prevent the price increases associated with patent hold-up without necessarily reducing incentives to innovate." *Id.* at 5.

[1014] U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS footnote 1 (2013).

[1015] The policy statement states: "A patent owner's voluntary F/RAND commitments may also affect the appropriate choice of remedy for infringement of a valid and enforceable standards-essential patent. In some circumstances, the remedy of an injunction or exclusion order may be inconsistent with the public interest. . . Such an order may harm competition and consumers by degrading one of the tools SDOs employ to mitigate the threat of such opportunistic actions by the holders of F/RAND-encumbered patents that are essential to their standards." *Id.* at 6, "The DOJ and USPTO are concerned about the potential impact of exclusion orders on 'competitive conditions in the United States' and 'United States consumers' in some cases involving F/RAND-encumbered patents that are essential to a standard, and the conditions under which they may be denied. Although, . . . , an exclusion order for infringement of F/RAND-encumbered patents essential to a standard may be appropriate in some circumstances, we believe that, depending on the facts of individual cases, the public interest may preclude the issuance of an exclusion order in cases where the infringer is acting within the scope of the patent holder's F/RAND commitment and is able, and has not refused, to license on F/RAND terms." *Id.* at 8-9, "In an era where competition and consumer welfare thrive on interconnected, interoperable network platforms, the DOJ and USPTO urge the USITC to consider whether a patent holder has acknowledged voluntarily through a commitment to license its patents on F/RAND terms that money damages, rather than injunctive or exclusionary relief, is the appropriate remedy for infringement." *Id.* at 9.

- Are unable or refuse to take F/RAND licenses;
- Refuse to pay what has been determined to be F/RAND royalties;
- Refuse to engage in negotiations to determine F/RAND terms; or
- Are not subject to a courts' jurisdiction that could award damages.[1016]

These examples represent exceptions to the two agencies' general position. Therefore, even though the agencies disfavored the issuance of exclusion orders, this position was not absolute. The agencies recommended that exclusion orders should be limited when it was clear that patentees' interests and innovators' incentives are appropriately protected.[1017]

c Presidential Veto (2013)

On August 3, 2013, President Barack Obama, acting through the United States Trade Representative ("USTR"), disapproved of the ITC's decision to issue an exclusion order and cease-and-desist order in a case involving certain electronic devices, including wireless communication devices, portable music and data processing devices, and tablet computers.[1018] In the ITC's determination, the ITC decided that Apple had violated Section 337 when it had imported electronic devices that infringed a United States patent owned by Samsung so it issued exclusion and cease-and-desist orders.[1019] The exclusion order stopped the unlicensed import of infringing devices manufactured for or on behalf of Apple.[1020] The cease-and-desist order prohibited Apple from engaging in certain activities, such as the sale of these products in the American market.[1021] However, the President vetoed these two orders when considering the public interest impact the orders would cause.[1022] This is the first instance of presidential disapproval of an ITC exclusion order since 1987.

The presidential veto affirmed the policies set forth in the DOJ and USPTO 2013 Policy Statement, including the importance of having technologically advanced standards the substantive concern of patent hold-up and hold-out, and the balance between IP protection and economic progress.[1023] As the Policy Statement makes clear, whether public interest considerations counsel against a particular exclusion order depends on the specific circumstances at issue.[1024] In this case, the President thought that the ITC's exclusion and cease-and-desist orders would be harmful to the U.S. economy and U.S. consumers. Based on public interest concerns, the President disapproved of the ITC's determination.[1025]

[1016] *Id.* at 7.

[1017] The end of the statement reads: "Finally, determinations on the appropriate remedy in cases involving F/RAND- encumbered, standards-essential patents should be made against the backdrop of promoting both appropriate compensation to patent holders and strong incentives for innovators to participate in standards-setting activities." *Id.* at 10.

[1018] THE U.S. TRADE REPRESENTATIVE, EXEC. OFFICE OF THE PRESIDENT, DISAPPROVAL OF THE U.S. INTERNATIONAL TRADE COMMISSION'S DETERMINATION IN THE MATTER OF CERTAIN ELECTRONIC DEVICES, INCLUDING WIRELESS COMMUNICATION DEVICES, PORTABLE MUSIC AND DATA PROCESSING DEVICES, AND TABLET COMPUTERS, INVESTIGATION NO. 337-TA-7941 1 (2013), *available at* https://ustr.gov/sites/default/files/08032013%20Letter_1.PDF (last visit date: April 16, 2015).

[1019] *Id.*

[1020] *Id.*

[1021] *Id.*

[1022] *Id.* at 3.

[1023] *Id.* at 2-3.

[1024] *Id.* at 2.

[1025] The veto stated that: "After extensive consultations with the agencies of the Trade Policy Staff Committee and the Trade Policy Review Group, as well as other interested agencies and persons, I have decided to

The ITC's power to issue exclusion order was the primary subject matter for the three administrative decisions and guidance discussed above. While this was happening, the cases in the following subsections dealt with a similar subject matter, injunctive relief in patent remedy. The Unites States courts appeared to take the same general stance as the government agencies. The courts' and agencies' general position was not to grant SEP holders either injunctive relief or exclusionary orders due to the patentees' FRAND commitment to SSOs.

2. Judicial Decisions

a Microsoft v. Motorola (9th Circuit 2012, 2015)

On September 11, 2012, the Ninth Circuit reviewed and affirmed the foreign anti-suit injunction granted by the District Court for the Western District of Washington.[1026] In this case, Motorola (SEP holder) appealed the district court's preliminary injunction that temporarily enjoined Motorola from enforcing a patent injunction that it obtained against Microsoft in Germany.[1027] This case primarily implicated two patents (European Patent Nos. 0615384 and 0538667), essential to the H.264 video coding standard ("H.264 Standard") set by ITU.[1028] The Ninth Circuit stated in its decision that granting injunctive relief to an SEP holder was inconsistent with the FRAND commitment, and that the FRAND license commitment precludes injunctive relief.[1029] On July 30, 2015, the Ninth Circuit reiterated the decision that the FRAND commitment arguably guarantees that the SEP holder will not take steps in keeping would-be users from using the patented technology, such as seeking injunctive relief.[1030]

In addition, on November 29, 2012, the District Court again dismissed Motorola's request for injunctive relief for patent infringement of Motorola's asserted patents (U.S. Patent Nos. 7,310,374, 7,310,375, and 7,310,376).[1031] In the case, Motorola alleged that Microsoft's Windows 7 operating system infringed these three SEPs, which were essential to the H.264 Standard.[1032] This case presented many SEP issues that were at issue between Motorola and Microsoft. In addition to the injunction issue, the case also addressed whether Motorola's FRAND license commitment to SSO

---

disapprove the USITC's determination to issue an exclusion order and cease and desist order. This decision is based on my review of the various policy considerations discussed above as they relate to the effect on competitive conditions in the U.S. economy and the effect on U.S. consumers." *Id.* at 3.

[1026] Microsoft Corp. v. Motorola, Inc., 696 F.3d 872 (9th Cir. Wash. 2012).

[1027] *Id.* at 875.

[1028] *Id.* at 875-876, Microsoft Corp. v. Motorola, Inc., 871 F. Supp. 2d 1089, 1096 (W.D. Wash. 2012).

[1029] The Ninth Circuit held that: "Motorola, in its declarations to the ITU, promised to 'grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to use the patented material necessary' to practice the ITU standards. . . Implicit in such a sweeping promise is, at least arguably, a guarantee that the patent-holder will not take steps to keep would-be users from using the patented material, such as seeking an injunction, but will instead proffer licenses consistent with the commitment made. . . Moreover, even if Motorola did not breach its contract, then, *however* the RAND rate is to be determined under the ITU standards, injunctive relief against infringement is arguably a remedy inconsistent with the licensing commitment. . . We conclude that the district court did not abuse its discretion in determining that Microsoft's contract-based claims, including its claim that the RAND commitment precludes injunctive relief, would, if decided in favor of Microsoft, determine the propriety of the enforcement by Motorola of the injunctive relief obtained in Germany." Microsoft Corp. v. Motorola, Inc., 696 F.3d 872, 884-885 (9th Cir. Wash. 2012).

[1030] Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024, 1030 (9th Cir. Wash. 2015).

[1031] Microsoft Corp. v. Motorola, Inc., 2012 U.S. Dist. LEXIS 170587 19, 25 (W.D. Wash. Nov. 29, 2012).

[1032] *Id.* at 19.

was an enforceable contract or a third-party beneficiary contract.[1033] More importantly, the court determined the FRAND royalty rate and FRAND royalty range for Motorola's SEP portfolios.[1034] Because the royalty decision was pending decision in the District Court as well, the court held that Motorola could not show irreparable harm.[1035] Consequently, the court concluded that injunctive relief would be improper. [1036] The court reiterated the *eBay* four-factor test to justify denying the injunction.[1037]

b Realtek v. LSI (N.D. Cal. 2013)

In this case, the standard at issue was the IEEE 802.11 WiFi standard for wireless Internet connectivity.[1038] Corporation LSI owned two patents, U.S. Patent Nos. 6,452,958 and 6,707,867 that they designated as essential to the 802.11 standard.[1039] This case involved simultaneous actions that proceeded parallel to one another. In March 2012, LSI initiated an ITC Section 337 action in order to obtain both exclusion and cease-and-desist orders against Realtek.[1040] In June 2012, Realtek then filed the case of *Realtek v. LSI*, asserting that LSI breached the FRAND license obligations by initiating the ITC proceeding before approaching Realtek with a FRAND license offer.[1041] The court ultimately held that the LSI' initiation of Section 337 was aimed to gain leverage in future licensing negotiations and was therefore inappropriate.[1042] The court indicated that the act of seeking injunctive relief was inherently inconsistent with and thus a breach of the LSI' promise to license under FRAND terms.[1043]

[1033] *Id.* at 19-20. The decision did not offer any clear or detailed rationale as to why the FRAND license commitment is considered an enforceable contract or a third-party beneficiary contract. Meanwhile, German and Chinese jurisdictions both had different opinions on the same FRAND commitment issue. It is therefore predicted that U.S. courts in the future will further interpret and discuss these issues in arising SEP disputes.

[1034] *Id.* at 22-25.

[1035] *Id.* at 25, 30.

[1036] *Id.*

[1037] The Washington District Court held that " 'According to well-established principles of equity, a plaintiff seeking a permanent injunction must satisfy a four-factor test before a court may grant such relief.' *eBay Inc. v. MercExchange, L.L.C.* . . . 1. Irreparable Harm. . . As Microsoft has committed to accept a license on RAND terms for Motorola's entire H.264 standard essential patent portfolio, and the litigation is continuing to determine the details of such a license, it is now clear that at some point in the future (either by agreement of the parties or by court adjudication) a license agreement for the Motorola Asserted Patents will become a reality. Because Microsoft will pay royalties under any license agreement from the time of infringement within the statute of limitations, this license agreement will constitute Motorola's remedy for Microsoft's use of Motorola's H.264 standard essential patent portfolio to include the Motorola Asserted Patents. Accordingly, Motorola cannot demonstrate that it has been irreparably harmed. 2. Adequate Remedy at Law. . . Motorola's obligation to grant such a RAND license to Microsoft far preceded the onset of this litigation, meaning that at all times during this litigation, the issue was not if, but when and under what terms, a license agreement would be established between Microsoft and Motorola. Thus, because Motorola has always been required to grant Microsoft a RAND license agreement for its H.264 standard essential patents, as a matter of logic, the impending license agreement will adequately remedy Motorola as a matter of law." *Id.* at 25-30.

[1038] Realtek Semiconductor Corp. v. LSI Corp., 946 F. Supp. 2d 998, 1001 (N.D. Cal. 2013).

[1039] *Id.*

[1040] *Id.* at 1002.

[1041] *Id. at* 1002-1003.

[1042] The court held that: "... defendants breached their contractual obligations to IEEE and to Realtek as a third-party beneficiary of that contract by seeking injunctive relief against Realtek before offering Realtek a license. The court's breach of contract holding is limited to the situation here, where defendants did not even attempt to offer a license, on 'RAND' terms or otherwise, until after seeking injunctive relief. This conduct is a clear attempt to gain leverage in future licensing negotiations and is improper." *Id.* at 1008.

[1043] The court stated: "In promising to license on RAND terms, defendants here admit that monetary damages, namely a RAND royalty, would be adequate compensation for any injury it has suffered as a result of Realtek's

In addition, the court also granted Realtek's motion for a preliminary injunction enjoining the LSI from enforcing any exclusion order or injunctive relief by the ITC that they might obtain against Realtek with respect to the SEPs at issue.[1044] The court held that the preliminary injunction should remain in effect until the court determined that the LSI's FRAND obligations and LSI had complied therewith.[1045] When making this decision, the Court considered both appropriateness and the public interest as reasons to deny injunctive relief to FRAND-encumbered SEP owners.[1046]

c Apple v. Motorola (Federal Circuit 2014)

In the case, Apple filed a complaint against Motorola on October 29, 2010, asserting infringement of three patents.[1047] Motorola counterclaimed, asserting six of its own patents.[1048] After Motorola's counterclaim, Apple then amended its complaint to include an additional twelve patents.[1049] One of Motorola's six patents (U.S. Patent Nos. 6,359,898) was an SEP, and thus Motorola had agreed to license it on FRAND license terms.[1050] In the district court decision, Judge Posner, sitting by designation, rejected Motorola's injunctive relief claim for this SEP.[1051]

---

allegedly infringing conduct . . . Moreover, Realtek is harmed as a result of the breach because the pending threat of an exclusion order gives defendants inherent bargaining power in any RAND licensing negotiation that may now take place." *Id.* at 1006-1007, "The court has already determined that defendant's act of seeking an exclusion order or injunctive relief by the ITC is inconsistent with defendants' RAND obligations at this time. . . Unless and until Realtek were to refuse a license under the court's-determined RAND terms (which Realtek indicates it will not do), then any exclusion order or injunctive relief is inconsistent with defendants' RAND obligations . . . After this court has determined defendants' RAND obligations and defendants have complied with those obligations, defendants may then pursue any injunctive relief that may become appropriate at that time." *Id.* at 1008-1009.

[1044] *Id.* at 1009.

[1045] *Id.* at 1010.

[1046] The court applied the *Winter* test in the case: "(a) Likelihood of success on the merits: The court has already determined that defendant's act of seeking an exclusion order or injunctive relief by the ITC is inconsistent with defendants' RAND obligations at this time. . . Unless and until Realtek were to refuse a license under the court's-determined RAND terms (which Realtek indicates it will not do), then any exclusion order or injunctive relief is inconsistent with defendants' RAND obligations. (b) Likelihood of irreparable harm: Realtek has shown that the threat of an exclusion order has harmed its reputation and poses an imminent threat of customer and revenue loss. . . (c) Balancing of equities: The court concludes that the balancing of equities also weighs in favor of a preliminary injunction. . . After this court has determined defendants' RAND obligations and defendants have complied with those obligations, defendants may then pursue any injunctive relief that may become appropriate at that time. (d) Public interest: Finally, the preliminary injunction serves the public interest by 'mak[ing] clear that commitments to make patents available on reasonable terms matter.' . . . the preliminary injunction here 'ensur[es] standard essential patents are accessible to all comers under RAND terms' and 'permit[s] [Realtek's] customers, who rely on [Realtek's Wi-Fi component parts], to conduct business uninterrupted. . .' " *Id.* at 1008-1009.

[1047] Apple initially filed its complaint in the United States District Court for the Western District of Wisconsin. After claim construction began in Wisconsin, the case was transferred to the United States District Court for the Northern District of Illinois, where Judge Posner sat by designation. Apple Inc. v. Motorola, Inc., 110 U.S.P.Q.2D 1695, 1700 (Fed. Cir. Apr. 25, 2014).

[1048] *Id.*

[1049] *Id.*

[1050] *Id.* at 1726.

[1051] Judge Posner stated in the decision that: "I don't see how, given FRAND, I would be justified in enjoining Apple from infringing the '898 unless Apple refuses to pay a royalty that meets the FRAND requirement. By committing to license its patents on FRAND terms, Motorola committed to license the '898 to anyone willing to pay a FRAND royalty and thus implicitly acknowledged that a royalty is adequate compensation for a license to use that patent. How could it do otherwise? How could it be permitted to enjoin Apple from using

Two years later, the Federal Circuit affirmed the district court's decision that Motorola was not entitled to an injunction for infringement of the FRAND-committed patent.[1052] However, Judge Posner's *per se* rule on FRAND-encumbered patents was reversed by the Federal Circuit.[1053] The Federal Circuit eventually turned to the *eBay* four factors to decide whether to issue a permanent injunction.[1054] Furthermore, the Federal Circuit stated that irreparable harm (the first factor in *eBay* factors) would be hard to prove when an SEP is committed to FRAND license terms.[1055] As a result, it would be a rare case where the SEP owner would be entitled to a permanent injunction, prohibiting the infringers from practicing the SEP. In other words, because of the FRAND commitment, money damages (not injunctive relief) may be adequate relief to fully compensate the SEP owner from any further infringement.[1056]

Thus it is clear that a trend is now emerging in U.S. courts to rarely grant permanent injunctions to FRAND-encumbered patent owners. As illustrated in this *Apple v. Motorola* decision, a rare exception may occur when the alleged infringer unilaterally refuses a FRAND royalty or unreasonably delays negotiations to the same effect.[1057] An SEP holder may also prove irreparable harm and prevail under the *eBay* four-factor test. However, like the *eBay* four-factor test, both FRAND terms and (un)reasonableness review are somewhat ambiguous. This uncertainty and ambiguity leave courts substantial discretion in making determinations on a case by case basis.

---

an invention that it contends Apple *must* use if it wants to make a cell phone with UMTS telecommunications capability—without which it would not be a cell *phone*." Apple, Inc. v. Motorola, Inc., 869 F.Supp.2d 901, 913-914 (2012).

[1052] Apple Inc. v. Motorola, Inc., 110 U.S.P.Q.2D 1695, 1700 (Fed. Cir. Apr. 25, 2014).

[1053] The Federal Circuit ruled that "To the extent that the district court applied a *per se* rule that injunctions are unavailable for SEPs, it erred. While Motorola's FRAND commitments are certainly criteria relevant to its entitlement to an injunction, we see no reason to create, as some *amici* urge, a separate rule or analytical framework for addressing injunctions for FRAND-committed patents. The framework laid out by the Supreme Court in *eBay*, as interpreted by subsequent decisions of this court, provides ample strength and flexibility for addressing the unique aspects of FRAND committed patents and industry standards in general." *Id.* at 1726.

[1054] *Id.*

[1055] The Federal Circuit held that: "A patentee subject to FRAND commitments may have difficulty establishing irreparable harm. On the other hand, an injunction may be justified where an infringer unilaterally refuses a FRAND royalty or unreasonably delays negotiations to the same effect. . . To be clear, this does not mean that an alleged infringer's refusal to accept any license offer necessarily justifies issuing an injunction. For example, the license offered may not be on FRAND terms. In addition, the public has an interest in encouraging participation in standard-setting organizations but also in ensuring that SEPs are not overvalued. While these are important concerns, the district courts are more than capable of considering these factual issues when deciding whether to issue an injunction under the principles in eBay." *Id.* at 1726.

[1056] The Federal Circuit held that: "Applying those principles here, we agree with the district court that Motorola is not entitled to an injunction for infringement of the '898 patent. Motorola's FRAND commitments, which have yielded many license agreements encompassing the '898 patent, strongly suggest that money damages are adequate to fully compensate Motorola for any infringement. Similarly, Motorola has not demonstrated that Apple's infringement has caused it irreparable harm. Considering the large number of industry participants that are already using the system claimed in the '898 patent, including competitors, Motorola has not provided any evidence that adding one more user would create such harm. Again, Motorola has agreed to add as many market participants as are willing to pay a FRAND royalty. Motorola argues that Apple has refused to accept its initial licensing offer and stalled negotiations. However, the record reflects that negotiations have been ongoing, and there is no evidence that Apple has been, for example, unilaterally refusing to agree to a deal. Consequently, we affirm the district court's grant of summary judgment that Motorola is not entitled to an injunction for infringement of the '898 patent." *Id.* at 1726-1727.

[1057] *Id.* at 1726.

3. Injunctive Relief Summary

After ending its policy of intervening in SEP disputes through public antitrust regulation, the United States government began to respond to private SEP disputes on permanent injunctions (exclusion orders). In the beginning, the courts debated how best to handle this SEP injunction issue. However, beginning in 2012, a new doctrine has begun to emerge through administrative agencies' guidance and judicial decisions.

The first position is that the established rules and factors still operate in the administrative agencies or courts addressing SEP injunction issues. *Apple v. Motorola* in 2014 confirmed that a court still considers the *eBay* factors when deciding whether to impose a permanent injunction. Likewise, as indicated in the Presidential Veto in 2013, the ITC considers the public interest as a factor in Section 337.

The second general position is a policy of not granting permanent injunctions or exclusion orders. Permanent injunctions are not favored because a FRAND commitment would make money damages appropriate and would make it impossible to demonstrate irreparable harm (the *eBay* factors). Exclusion orders are not favored because the United States economy and consumers may be harmed by them (the Section 337 factors).

Finally, despite this general position not to grant exclusion orders or permanent injunctions, administrative agencies and courts have recognized some exceptions as illustrated in *Apple v. Motorola* and the DOJ and USPTO 2013 Policy Statement. These exceptions occur when:

(1) standard implementers unilaterally refuse to pay already determined FRAND royalties;
(2) standard implementers refuse or unreasonably delay negotiating FRAND terms;
(3) standard implementers are not subject to the jurisdiction of courts that could award damages; or
(4) SEP holders can prevail on the four *eBay* factors or Section 337 public interest factors.

B. Calculation of Damages

When a court determines a patent has been infringed, the remedies available to a patentee are money damages in compensation for past infringement or an injunction to stop infringers from making, using, and selling the invention.[1058] While the judge has discretion whether to grant an injunction, the calculation of damages is a question of fact for the jury.[1059] With regard to damages, 35 U.S.C. § 284 provides that a patentee can elect to pursue damages in either of two forms: lost profits attributable to the patent infringement; or reasonable royalties as the measure of damages.[1060] The basic goal of this statute is to restore the patentee to the financial position the patentee would have been in but for the patent infringement.[1061] Causation is a key element in attaining a recovery of lost profits.[1062] The most common method of establishing "but-for" causation of lost profits is to satisfy the elements set forth in *Panduit v. Stahlin Brothers Fibre Works* (the

---

[1058] MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 834 (3d ed. 2009), ALAN L. DURHAM, PATENT LAW ESSENTIALS: A CONCISE GUIDE 223-224 (4th ed. 2013), JANICE M. MUELLER, PATENT LAW 624 (4th ed. 2012).

[1059] ALAN L. DURHAM, PATENT LAW ESSENTIALS: A CONCISE GUIDE 224 (4th ed. 2013).

[1060] *Id.* at 224, 226. 35 U.S.C. § 284 provides that: "Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court."

[1061] JANICE M. MUELLER, PATENT LAW 625-626 (4th ed. 2012).

[1062] *Id.* at 626.

Panduit test or analysis).[1063] However, in many cases, causation is hard to prove or the amount of lost profits is difficult to calculate, which may motivate the patentee to choose instead to pursue reasonable royalty as the measure of damages.[1064] Under 35 U.S.C. § 284, this reasonable royalty is the minimum amount a patentee can be awarded.[1065]

To calculate a reasonable royalty, the best measure might refer to an established royalty.[1066] However, in the majority of cases, such an established royalty on the basis of an industry standard rate or prior license does not exist.[1067] In these cases, the court will determine what would have happened in a hypothetical negotiation between a willing licensor and a willing licensee at the time the infringement began.[1068] In determining the contours of the hypothetical negotiation, United States courts have traditionally considered evidence from an extensive list of factors as set forth in the leading case of *Georgia Pacific v. United States Plywood* (known as the "*Georgia Pacific* factors").[1069] The other common approach is the analytical method, which focuses on the infringer's

---

[1063] Barry L. Grossman, *Chapter 31. Patent Infringement Damages*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 1403, 1406-1407 (Barry L. Grossman & Gary M. Hoffman ed., 2010). Under the *Panduit* test, "to obtain as damages the profits on sales he would have made absent the infringement, i.e., the sales made by the infringer, a patent owner must prove: (1) demand for the patented product, (2) absence of acceptable noninfringing substitutes, (3) his manufacturing and marketing capability to exploit the demand, and (4) the amount of the profit he would have made." Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 575 F.2d 1152, 1156 (6th Cir. Mich. 1978).

[1064] ALAN L. DURHAM, PATENT LAW ESSENTIALS: A CONCISE GUIDE 226 (4th ed. 2013).

[1065] *Id.*, Barry L. Grossman, *Chapter 31. Patent Infringement Damages*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 1403, 1404 (Barry L. Grossman & Gary M. Hoffman ed., 2010), JANICE M. MUELLER, PATENT LAW 637 (4th ed. 2012).

[1066] Monsanto Co. v. McFarling, 488 F.3d 973, 978-979 (Fed. Cir. 2007).

[1067] JANICE M. MUELLER, PATENT LAW 637, 638 (4th ed. 2012).

[1068] Barry L. Grossman, *Chapter 31. Patent Infringement Damages*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 1403, 1420 (Barry L. Grossman & Gary M. Hoffman ed., 2010).

[1069] JANICE M. MUELLER, PATENT LAW 639 (4th ed. 2012). The *Georgia Pacific* factors are: "1.The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty. 2. The rates paid by the licensee for the use of other patents comparable to the patent in suit. 3. The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold. 4. The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly. 5. The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promotor. 6. The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales. 7. The duration of the patent and the term of the license. 8. The established profitability of the product made under the patent; its commercial success; and its current popularity. 9. The utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results. 10. The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention. 11. The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use. 12. The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions. 13. The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer. 14. The opinion testimony of qualified experts. 15. The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee -- who

projections of profit for the infringing product and then apportions the projected profits between the patentee and infringer.[1070]

Choosing an appropriate royalty base is always a major issue in determining reasonable royalty.[1071] The current trend in the United States is to focus on the true value of the patented invention.[1072] However, when recovery is sought on sales of unpatented components sold with patented components, *Rite-Hite v. Kelley* held that the unpatented and patented components must function together so as to produce a desired end product or result.[1073] In other words, "all the components together must be analogous to components of a single assembly or be parts of a complete machine, or they must constitute a functional unit."[1074] This ruling applies to both the lost profits and reasonable royalty approaches.[1075]

Table 5-4: Evolving SEP Dispute concerning FRAND Royalties

Year	Name	Administrative		Legislative	Judicial Decision
		Decision	Guideline		
2013.4 (2015.7)	*Microsoft v. Motorola*				X
2013.9	*In re Innovatio*				X
2014.12	*Ericsson v. D-Link*				X
2015.12	*CSIRO v. Cisco*				X

Source: Compiled by the author

As shown in Table 5-4, SEP disputes concerning FRAND royalties have only been discussed in judicial decisions. They have not been discussed in any administrative or legislative decisions. Thus, this situation differs significantly from the antitrust intervention and injunction issue within SEP disputes. The following subsection reviews these judicial decisions and then offers a summary of the cases as they have evolved.

1. Judicial Decisions

a Microsoft v. Motorola (W.D. Wash. 2013, 9th Circuit 2015)

In 2013, the United States District Court for the Western District of Washington made the first decision regarding an SEP's FRAND royalty.[1076] When Judge Robart first issued the decision for the case in 2013, this pioneer case, *Microsoft v. Motorola*, raised great attention and discussion in the legal community. While the case was being appealed and pending decision in the Ninth Circuit, subsequent FRAND disputes referred to the case's rationale and analysis framework, as seen in *In*

---

desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention -- would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license." Georgia-Pacific Corp. v. United States Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

[1070] Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1324 (Fed. Cir. 2009).

[1071] Barry L. Grossman, *Chapter 31. Patent Infringement Damages*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 1403, 1426 (Barry L. Grossman & Gary M. Hoffman ed., 2010).

[1072] *Id.* at 1404.

[1073] Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538, 1550 (Fed. Cir. 1995).

[1074] *Id.*

[1075] Barry L. Grossman, *Chapter 31. Patent Infringement Damages*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 1403, 1426 (Barry L. Grossman & Gary M. Hoffman ed., 2010).

[1076] Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013).

re Innovatio.[1077] The Ninth Circuit ultimately affirmed the decision on July 30, 2015.[1078] *Microsoft v. Motorola* serves as an important precedent for future FRAND royalty disputes.

On October 21, 2010, Motorola sent Microsoft a letter offering to license its SEPs on "Wi-Fi" or "802.11" (the "802.11 standard"); eight days later, Motorola sent Microsoft a similar letter offering to license its SEPs H.264 standard.[1079] In both letters, Motorola offered to license its 802.11 and H.264 SEPs at what it considered the FRAND rate of 2.25% of the price of the end product (e.g., Xbox 360, PC/laptop), and not on component software (e.g., Windows 7 software).[1080] Based on the offer letters, Microsoft claimed that Motorola had breached its FRAND commitment to the IEEE and International Telecommunication Union ("ITU").[1081] Microsoft contended that Motorola breached its FRAND obligations by making an unreasonable offer.[1082] Thus, the court was asked to decide the specific FRAND royalty rates and ranges, and to determine whether Motorola had breached its FRAND obligation.[1083]

The court developed a framework to assess FRAND royalties.[1084] The court adopted a modified version of the *Georgia-Pacific* factors to recreate a hypothetical negotiation between Motorola and Microsoft.[1085] Under the modified *Georgia-Pacific* framework, the first step was to examine

---

[1077] *See, e.g.,* Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014), In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013).

[1078] Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015). The Ninth Circuit concluded that: "With the parties' consent, the district court conducted a lengthy, thorough bench trial on the RAND rate and range. The court analyzed that evidence in its exhaustive findings of fact and conclusions of law, in a manner consistent with the Federal Circuit's recent approach to establishing damages in the RAND context. The court's factual findings were properly admitted at the jury trial. The jury's verdict was supported by substantial evidence, and its damages award was proper. The judgment of the district court is **AFFIRMED**." *Id.* at 1056-1057.

[1079] Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233, 13-14 (W.D. Wash. Apr. 25, 2013).

[1080] *Id.* at 14-15.

[1081] *Id.* at 15. In a previous decision, the court decided that Motorola's FRAND commitments were enforceable contracts between Motorola and its SSOs (i.e., IEEE and ITU). Microsoft therefore can enforce these contracts as a third-party beneficiary. *Id.*

[1082] *Id.* at 13.

[1083] *Id.* at 16.

[1084] *Id.* at 19.

[1085] *Id*. By eliminating three of the original *Georgia-Pacific* factors and modifying or combining other factors, the modified *Georgia-Pacific* factors could be summarized as follows: "G-P Factor 1: The royalties received by the patentee for the licensing of the patent-in-suit in other circumstances comparable to RAND-licensing circumstances. G-P Factor 2: The rates paid by the licensee for the use of other patents comparable to the patent-in-suit. G-P Factor 3: The nature and scope of the license. G-P Factor 6: The effect of the patented invention in promoting sales of other products of the licensee and the licensor, taking into account only the value of the patented technology and not the value associated with incorporating the patented technology into the standard. G-P Factor 8: The established profitability of the product made under the patent, its commercial success, and its current popularity, taking into account only the value of the patented technology and not the value associated with incorporating the patented technology into the standard. G-P Factor 9: The utility and advantages of the patent property over alternatives that could have been written into the standard instead of the patented technology in the period before the standard was adopted. G-P Factors 10-11: The contribution of the patent to the technical capabilities of the standard and also the contribution of those relevant technical capabilities to the licensee and the licensee's products, taking into account only the value of the patented technology and not the value associated with incorporating the patented technology into the standard. G-P Factor 12: The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions that are also covered by RAND-committed patents. G-P Factor 13: The portion of the realizable profit that

Motorola's H.264 and 802.11 SEP portfolios to determine each portfolio's importance to its respective standards, as well as the importance of these portfolios to Microsoft's standard-using products.[1086] The court held that Motorola's H.264 SEPs could be distributed among six patent families, and then discussed each family's technical value to the H.264 standard.[1087] The court ruled that Motorola's H.264 SEPs were only used in the Windows and Xbox products, and provided only minor importance to the overall functionality of these products.[1088] On the other hand, the court categorized Motorola's 802.11 SEPs into five technological areas.[1089] Because there was minimal evidence to demonstrate the essentiality, the court determined that Motorola's SEPs provided very little contribution to the 802.11 standard.[1090] Accordingly, Microsoft may disagree whether its Xbox products (its only products using the 802.11 standard) would require the license.[1091]

The second step was to determine FRAND royalty rates and ranges for Motorola's SEPs.[1092] The court considered the parties' proposed (and competing) comparable licensing agreements and patent pools.[1093] For Motorola's H.264 SEP portfolio, the court ruled that the royalty rate of the MPEG LA H.264 patent pool was a strong indicator, because the pool's characteristics closely aligned with the purpose of the FRAND commitment.[1094] However, unlike the MPEG LA H.264 patent pool, the Via Licensing 802.11 patent pool was not successful in encouraging widespread adoption of the 802.11 Standard.[1095] In determining the FRAND royalty of Motorola's 802.11 SEP portfolio, the court considered the Via Licensing 802.11 patent pool along with the Marvell Wi-Fi Chip and InteCap Analysis licensing agreements.[1096]

---

should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, significant features or improvements added by the infringer, or the value of the patent's incorporation into the standard. G-P Factor 14: The opinion testimony of qualified experts. G-P Factor 15: The amount that a licensor and a licensee would have agreed upon (at the time the infringement began) if both were considering the RAND commitment and its purposes, and had been reasonably and voluntarily trying to reach an agreement." In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061, 52-54 (N.D. Ill. Sept. 27, 2013).

[1086] Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233, 19, 65 (W.D. Wash. Apr. 25, 2013). The court held that "Factors 6, 8, 10, and 15 of the court's RAND-modified *Georgia-Pacific* analysis all require the court to examine the importance of Motorola's H.264 SEPs not only to the H.264 Standard itself, but also with respect to Microsoft's products. . . The court concludes that under a RAND obligation, reasonable parties in a hypothetical negotiation would not consider the value associated with incorporation of the patented technology into the standard. Instead, the negotiating parties would consider only the economic value of the patented technology—based on the technology's contribution to the standard and to the implementer's product itself—apart from the value associated with the standard." *Id.* at 122-123.

[1087] These six patent families were: Krause, Wu, Eifrig, MBAFF, PAFF, and Scan Families. In the decision, the court reasoned that the Krause, Wu, and Eifrig Families had technical value to the H.264 standard because they were directed at the core of H.264's feature of prediction. The MBAFF Family had technical value, because it was directed at the core of H.264 features- AFF coding and prediction. The PAFF Family had technical value, because it was directed at the core of H.264 features- coding and prediction. The Scan Family was technically valuable, because it was directed at the core of H.264 features- transform and quantization. *Id.* at 83-84, 88, 93, 99, 109, 115-116.

[1088] *Id.* at 135, 138.

[1089] The five 802.11 technology areas were channel access management, data modulation (a/g/n), network setup, data modulation (b/g), and security. *Id.* at 161.

[1090] *Id.* at 162-163, 166-167, 169-178, 180-181, 185-186, 189.

[1091] *See Id.* at 166-167, 170-174, 176-178, 180-181, 189.

[1092] *Id.* at 190.

[1093] *Id.* at 19-20, 65.

[1094] *Id.* at 242.

[1095] *Id.* at 267.

[1096] *Id.* at 294.

Finally, the court decided the FRAND royalty rate and range for Motorola's SEPs. For Motorola's H.264 SEP portfolio, the FRAND royalty rate was 0.555 cents per unit, with the upper bound at 16.389 cents and lower bound at 0.555 cents per unit.[1097] This result was only applicable to Microsoft's Windows and Xbox products.[1098] The royalty rate for the other products (using the H.264 standard) would be at the lower bound of 0.555 cents per unit.[1099] Regarding Motorola's 802.11 SEP portfolio, the FRAND royalty rate was 3.471 cents per unit, with the upper bound at 19.5 cents and the lower bound at 0.8 cents per unit.[1100] Likewise, this result was only applicable to Microsoft's Xbox products.[1101] The royalty rate of the other products (using the 802.11 standard) would be within the lower bound of 0.8 cents.[1102]

b In re Innovatio (N.D. Ill. 2013)

In the same year, the District Court for the Northern District of Illinois made the second decision on the same FRAND Royalty dispute in *In re Innovatio*.[1103] The determination of *In re Innovatio* followed the same reasoning as was set forth in *Microsoft v. Motorola*.[1104] In other words, the FRAND royalty determination based on modified *Georgia-Pacific* factors used to reconstruct a hypothetical negotiated result.

Innovatio brought a lawsuit against electronic device manufacturers (including Cisco, Motorola, HP), asserting that the manufacturers provided Wi-Fi equipped devices (e.g., the access point or terminal device) to coffee shops, hotels, restaurants, and other commercial users of wireless internet technology.[1105] Innovatio alleged that these Wi-Fi equipped devices had infringed various claims of Innovatio's twenty-three SEPs in the 802.11 standard.[1106] The parties agreed to analyze the patents in groups which the judge referred to as "families" of patents with similar functions (channel sharing, multi-transceiver and sleep). The parties also agreed to use the methodology set forth in *Microsoft v. Motorola* to determine the FRAND royalty rate the manufacturers needed to pay.[1107]

However, the court modified *Microsoft v. Motorola* method of calculating royalties because the circumstances of the Innovatio case were different.[1108] First, both parties in the case had waived their right to jury trial to determine the damages and FRAND obligation, and had consented to the court's determination of the disputed SEP damage questions.[1109] Accordingly, the court had to

---

[1097] *Id.* at 20, 303.
[1098] *Id.*
[1099] *Id.*
[1100] *Id.*
[1101] *Id.*
[1102] *Id.*
[1103] The court stated that: "To the best of the court's knowledge and that of the parties, only one other court has previously undertaken a judicial determination of a RAND licensing rate for standard-essential patents: *Microsoft Corp. v. Motorola, Inc., No. C10-1823, 2013 U.S. Dist. LEXIS 60233, 2013 WL 2111217 (W.D. Wash. Apr. 25, 2013)* (Robart, J.)." In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 49 (N.D. Ill. Sept. 27, 2013).
[1104] *Id.* at 49, 55-56.
[1105] *Id.* at 37-42.
[1106] *Id.*
[1107] *Id.* at 49.
[1108] *Id.* at 55-56.
[1109] *Id.* at 41.

determine a single FRAND rate to determine the damages, instead of a range.[1110] Secondly, Innovatio's asserted patent claims were determined essential to the 802.11 standard by the two parties' agreement and by the court's decision.[1111] There was no uncertainty about whether the patents were essential.[1112] So, unlike Judge Robart, the court did not adjust the FRAND rate in light of pre-litigation uncertainty regarding the essentiality.[1113] Finally, a Wi-Fi chip was to provide 802.11 functionality, so determining the importance of Innovatio's SEPs to the 802.11 standard also determined the importance of the SEPs to the Wi-Fi chip.[1114] The court's analysis therefore did not include a separate section evaluating the importance of Innovatio's SEPs to the allegedly infringing final products, but instead merged that analysis into an inquiry about the importance of Innovatio's SEPs to the 802.11 standard.[1115] As a result, the appropriate royalty base in the case was the small module Wi-Fi chip.[1116]

Following the framework in *Microsoft v. Motorola*, the court first distributed Innovatio's SEPs into four patent families, each reflecting a set of functions relevant to one area of 802.11's operation.[1117] The court then determined the SEPs' importance to the 802.11 standard, and examined the alternative technologies that could have been adopted into the standard.[1118] The court eventually ruled that Innovatio's SEPs in channel sharing and multi-transceiver "families" were of moderate to high importance to the 802.11 standard.[1119] Innovatio's SEPs in the sleep "family" were of moderate importance.[1120]

Unlike *Microsoft v. Motorola*, the decision did not compare the Via Licensing 802.11 patent pool when determining the FRAND royalty rate.[1121] Instead, the court adopted a modified "Top Down" approach to calculate the FRAND rate.[1122] The "Top Down" approach started with the average price of a Wi-Fi chip.[1123] The next step was to calculate the average profit of each chip, thereby isolating the portion of the income (from the sale of the chip) available to pay SEP royalties.[1124] The final step was to multiply the available profit by a fraction calculated as the number of Innovatio's 802.11

[1110] *Id.* at 56.
[1111] *Id.* at 41.
[1112] *Id.* at 57-60.
[1113] *Id.* at 60.
[1114] *Id.*
[1115] *Id.*
[1116] *Id*. The court also stated that: "In sum, Innovatio has provided the court no legally sound and factually credible method to apportion the price of the accused end-products to the value of only Innovatio's patented features. The court therefore has no choice but to look to the manufacturers' proposed method of calculating a RAND royalty based on the price of a Wi-Fi chip. Accordingly, for purposes of this opinion the court will consider the price of a Wi-Fi chip to be the appropriate RAND royalty base." *Id.* at 95-96.
[1117] *Id.* at 107.
[1118] *Id.* at 96, 100.
[1119] *Id.* at 120, 129-130.
[1120] *Id.* at 139-140. As for the fourth patent family (Mesh family), the parties agreed that the court need not consider it. Because of this, the FRAND royalty rate in this decision did not reflect the value of Innovatio's SEPs in the Mesh patent family. *Id.* at 107.
[1121] The court held that: "Using the Via patent pool, which the evidence shows did not include high-value patents, to calculate a RAND rate for low-value patents may be appropriate. By contrast, this court has determined that Innovatio's patent portfolio is of moderate to moderate-high importance to the 802.11 standard. In that context, the Via patent pool is not an appropriate comparable license. Accordingly, the court will not consider the Via patent pool when determining a RAND rate in this case." *Id.* at 158-159.
[1122] *Id.* at 163.
[1123] *Id.*
[1124] *Id.*

SEPs divided by the total number of 802.11 SEPs.[1125] In addition, the court agreed with the findings that "the top 10% of all electronics patents account for 84% of the value in all electronics patents."[1126] The court therefore agreed to adjust the value attributable to Innovatio's SEPs in the decision.[1127] In the end, the "Top Down" approach yielded a FRAND royalty rate of 9.56 cents per Wi-Fi chip.[1128]

In *Microsoft v. Motorola* and *In re Innovatio*, the United States district courts applied a similar analytical frameworks and procedures to determine FRAND royalty disputes. In December 2014, the Federal Circuit made its first decision in *Ericsson v. D-Link* about a FRAND royalty dispute. This Federal Circuit's decision affirmed some rules and reserved other rules as seen in *Microsoft v. Motorola* and *In re Innovatio.* The following subsection discusses *Ericsson v. D-Link*.

c Ericsson v. D-Link (Federal Circuit 2014)

On December 4, 2014, the Federal Circuit issued its first decision regarding a FRAND royalty dispute. *Ericsson v. D-Link* was also the first time a United States appellate court made a decision regarding a FRAND royalty. This decision offers important guidance for the future of SEP royalty disputes.

In the case, Ericsson brought an infringement action against D-Link, Acer, Toshiba, and other electronics manufacturers (collectively, "D-Link") in the District Court for the Eastern District of Texas.[1129] Ericsson alleged D-Link infringed its five patents essential to the 802.11 standard.[1130] The case was tried to a jury which found that D-Link had infringed the asserted three patents (Patent Nos. 6,424,625, 6,466,568, and 6,772,215).[1131] The jury eventually awarded roughly $10 million in damages—approximately 15 cents per infringing electronic device (such as Wi-Fi equipped laptops and routers). [1132] On appeal, D-Link raised two issues concerning FRAND royalty: (1) whether admitting evidence of a prior license to the jury had violated the entire market value rule ("EMVR"), and (2) whether the jury was instructed properly regarding Ericsson's FRAND obligations.[1133] The Federal Circuit ruled that the district court properly admitted the evidence of the prior license.[1134] However, the Federal Circuit vacated the jury's damages award because the district court incorrectly instructed the jury to consider irrelevant *Georgia-Pacific* factors. The court also vacated

---

[1125] *Id.*
[1126] *Id.* at 181.
[1127] *See Id.* at 163-164, 181-182.
[1128] *Id.* at 43-44, 183. For the precise calculation, the court stated that: "Multiplying the average Wi-Fi chip price of $14.85 by a profit margin of 12.1% yields an average profit of $1.80 on each chip. That $1.80 represents the total profit available to a chipmaker out of which to pay royalties for intellectual property. Next, the court multiplies $1.80 by 84%, the value attributable to the top 10% of 802.11 standard-essential patents, to obtain $1.51, the value attributable to the top 10% of all 802.11 standard-essential patents. Finally, the court multiples $1.51 by 19/300 to determine the pro rata share of the value in the top 10% of all 802.11 standard-essential patents attributable to Innovatio's nineteen-patent portfolio. The result is 9.56 cents. Accordingly, Dr. Leonard's Top Down method yields a RAND rate of 9.56 cents per Wi-Fi chip, which the court adopts as a RAND rate for licensing Innoatio's 802.11 patent portfolio." *Id.* at 182-183.
[1129] Ericsson Inc. v. D-Link Sys., 2013 U.S. Dist. LEXIS 110585 8 (E.D. Tex. Aug. 6, 2013).
[1130] Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 4 (Fed. Cir. Dec. 4, 2014).
[1131] *Id.*
[1132] *Id.*, Ericsson Inc. v. D-Link Sys., 2013 U.S. Dist. LEXIS 110585 9-10, 79 (E.D. Tex. Aug. 6, 2013).
[1133] Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 21, 50-51 (Fed. Cir. Dec. 4, 2014).
[1134] *Id.* at 53.

the damages award because it failed to instruct the jury that the FRAND royalty should be apportioned from the whole standard's value and should only be based on the invention's value.[1135]

The Federal Circuit confirmed the admissibility of evidence for the prior license, ruling that it was just the starting point for calculating a reasonable royalty award.[1136] An appropriately apportioned royalty award could be fashioned by starting with the entire market value of a multi-component product.[1137] However, to calculate the SEP royalty, the ultimate royalty award must be based on the incremental value that the patented technology adds to the end product.[1138] Thus, when the prior license (tied in multiple-component products) was admitted in a jury trial, the court should have given a cautionary instruction regarding the limited purpose of this evidence.[1139] Care should be taken to avoid misleading the jury by placing undue emphasis on the value of the entire product.[1140] In other words, the Federal Circuit held that the final determination of an SEP royalty should not merely be based on the entire final product. The court also indicated that the initial discussion can start with the value of the final product. Thus, one possible method to calculate an SEP's incremental value would be to consider the smallest salable unit.[1141]

The Federal Court held that no modified version of the *Georgia-Pacific* factors may be used in any FRAND-encumbered patents.[1142] The court therefore rejected D-Link's argument that the trial court should give instructions mirroring the analysis in *Innovatio* and *Microsoft*.[1143] The court stated it was unwise to create a new set of *Georgia-Pacific*-like factors for SEP cases to calculate FRAND royalties.[1144] Even though the court recognized the desire for a bright line rule and clear instructions, the court must instead consider the facts on the record when instructing the jury and should avoid rote reference to any particular damages formula.[1145] Even though *Ericsson v. D-Link* overturned the modified *Georgia-Pacific* factors as decided in the District Courts (i.e., along the lines of the reasoning in *Microsoft v. Motorola* and *In re Innovatio)*, the Federal Circuit at least confirmed the feasibility of the *Georgia-Pacific* factors in reconstructing the hypothetical negotiation over a

---

[1135] *Id.* at 78.

[1136] *Id.* at 53. The Federal Circuit held that: "While a number of our cases have referred to the concept of an entire market value 'rule,' the legal standard actually has two parts, which are different in character. There is one substantive legal rule, and there is a separate evidentiary principle; the latter assisting in reliably implementing the rule when—in a case involving a perunit royalty—the jury is asked to choose a royalty base as the starting point for calculating a reasonable royalty award. . ." *Id.*

[1137] *Id.* at 55.

[1138] *Id.* at 54.

[1139] *Id.* at 59. The Federal Circuit held that: ". . . We do conclude, however, that, when licenses based on the value of a multi-component product are admitted, or even referenced in expert testimony, the court should give a cautionary instruction regarding the limited purposes for which such testimony is proffered if the accused infringer requests the instruction. The court should also ensure that the instructions fully explain the need to apportion the ultimate royalty award to the incremental value of the patented feature from the overall product." *Id.*

[1140] *Id.* at 55.

[1141] *See Id.* at 56.

[1142] *Id.* at 68. The court held that: "In a case involving RAND-encumbered patents, many of the *Georgia-Pacific* factors simply are not relevant; many are even contrary to RAND principles. . . Consequently, the trial court must carefully consider the evidence presented in the case when crafting an appropriate jury instruction. In this case, the district court erred by instructing the jury on multiple *Georgia-Pacific* factors that are not relevant, or are misleading, on the record before it, including, at least, factors 4, 5, 8, 9, and 10 of the *Georgia-Pacific* factors." *Id.* at 66-67.

[1143] *Id.* at 68.

[1144] *Id.*

[1145] *Id.* at 68-69.

FRAND rate and range. Following this line of thinking, trial courts should focus on the actual FRAND commitment in crafting jury instructions.[1146]

Finally, the decision discussed guidelines on the apportionment analysis for SEPs. It stated that the FRAND royalty must be apportioned according to the value of the patented technology, not the value of the standard as a whole or any increased value the patented feature gains from its inclusion in the standard.[1147] That is, the FRAND royalty should be based on the incremental value the patented technology adds to the product, not any value added by the standardization of that technology.[1148] Therefore, the patented feature must be apportioned from all of the unpatented features reflected in the standard.[1149] In addition, the Federal Circuit appears to be requiring that the patentee's royalty must be premised on some measure of value that differs from the value added by the standard's adoption of the patented technology.[1150] The because the guidance provided by the Federal Circuit in this area remains unclear, it will be difficult for lower courts and parties to follow it in the future.

d CSIRO v. Cisco (Federal Circuit 2015)

On December 3, 2015, the Federal Circuit issued its second decision regarding SEP reasonable royalties in *Commonwealth Sci. & Indus. Research Organisation ("CSIRO") v. Cisco*.[1151] The Federal Circuit rendered a decision in *CSIRO v. Cisco* after its *Ericsson v. D-Link* in 2014 and the Ninth Circuit's *Microsoft v. Motorola* in 2015.[1152] *CSIRO v. Cisco* is expected to further illustrate how SEP reasonable royalties are determined in the United States.

CSIRO filed a lawsuit against Cisco for infringement of its SEP (U.S. Patent No. 5,487,069).[1153] The CSIRO SEP is essential to different revisions of 802.11 standards, including 802.11a, g, n, and ac, whereas IEEE only obtained CSIRO's FRAND commitment in 802.11a.[1154] Since early 2001, Cisco used the patented technology according to its technology license agreement with CSIRO.[1155] In 2004 though, CSIRO started to license the SEP to other Wi-Fi industry players based on its "Rate

---

[1146] *Id.* at 67, 77. The court held that: "In sum, we hold that, in all cases, a district court must instruct the jury only on factors that are relevant to the specific case at issue. There is no *Georgia-Pacific*-like list of factors that district courts can parrot for every case involving RAND-encumbered patents. The court should instruct the jury on the actual RAND commitment at issue and must be cautious not to instruct the jury on any factors that are not relevant to the record developed at trial." *Id.* at 77.

[1147] *Id.* at 69, 71, 77.

[1148] *Id.* at 69-70. The court further held that: "We merely hold that the royalty for SEPs should reflect the approximate value of that technological contribution, not the value of its widespread adoption due to standardization. Because SEP holders should only be compensated for the added benefit of their inventions, the jury must be told to differentiate the added benefit from any value the innovation gains because it has become standard essential. Although the jury, as the fact finder, should determine the appropriate value for that added benefit and may do so with some level of imprecision, we conclude that they must be told to consider the difference between the added value of the technological invention and the added value of that invention's standardization." *Id.* at 73.

[1149] *Id.* at 69.

[1150] *Id.*

[1151] Commonwealth Sci. & Indus. Research Organisation v. Cisco Sys., 809 F.3d 1295 (Fed. Cir. Dec. 3, 2015).

[1152] *See also* Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014). Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015).

[1153] Commonwealth Sci. & Indus. Research Organisation v. Cisco Sys., 809 F.3d 1295, 1297 (Fed. Cir. Dec. 3, 2015).

[1154] *Id.* at 1298.

[1155] *Id.*

Card."[1156] The Rate Card consisted of various royalties per product sold based on the sales amount and period from offer to acceptance; the royalties varied from $1.40 to $3.80 per unit.[1157] When CSIRO approached Cisco with this Rate Card rate in 2004, Cisco did not accept CSIRO's offer.[1158] CSIRO and Cisco failed to reach an agreement on the license rate, so CSIRO eventually filed the suit against Cisco.[1159] The Eastern District of Texas determined that the license rate should be $0.90 to $1.90 primarily based on CSIRO's 2004 Rate Card offer without adjustments in light of the *Georgia-Pacific* factors.[1160] Cisco then appealed the decision and alleged that the district court erred in the following ways:[1161]

(1) The District Court failed to conduct is damages analysis by first looking at the Wi-Fi chip, the smallest salable patent-practicing unit ("SSPPU");
(2) The District Court failed to apply the *Georgia-Pacific* factors in adjusting license rates to account for the SEP's essentiality.

With regard to the first allegation, the Federal Circuit ruled that the district court did not violate apportionment principles in employing a damages model that took into account each party's informal negotiations with respect to the end product.[1162] The court indicated that different cases present different facts and that damages models are fact-dependent; therefore, it is necessary to utilize more than one reliable method to calculate reasonable royalties for SEPs.[1163] Among the methods, the court held that the SSPPU principle was inapplicable in the case, as the District Court did not apportion from a royalty base at all.[1164] Instead, the District Court began its analysis with the parties' negotiations, which had centered on a license rate for the SEP.[1165] This analysis built in apportionment at the outset.[1166] In addition, it is untenable that Cisco require all damages models to begin with the SSPPU, because this allegation conflicts with the Federal Circuit's prior approvals of a methodology that values the asserted patent based on comparable licenses.[1167] The Federal Circuit therefore held that the District Court did not err in valuing the asserted patent with reference to end product licensing negotiations despite finding that the District Court may still need to adjust the negotiated royalty rates to account for other factors.[1168]

However, with regard to the adjustment in Cisco's second allegation, the Federal Court held that the District Court erred in failing to account for extra value accruing to the SEP from the standardization.[1169] Regardless of whether the SEP is under the FRAND commitment, SEPs' reasonable royalties generally must not include any value flowing to the patent from the standard's adoption.[1170] The adjustments to the *Georgia-Pacific* factors should equally apply to FRAND-

[1156] *Id.*
[1157] *Id.* at 1298-1299.
[1158] *Id.* at 1299.
[1159] *Id.*
[1160] *Id.* at 1300.
[1161] *Id.* at 1300-1301.
[1162] *Id.* at 1304.
[1163] *Id.* at 1301-1302.
[1164] *Id.* at 1302.
[1165] *Id.* at 1302-1303.
[1166] *Id.* at 1303.
[1167] *Id.*
[1168] *Id.*
[1169] *Id.* at 1304, 1306.
[1170] *Id.* at 1305.

encumbered SEPs and ordinary SEPs.[1171] Where the FRAND commitment differs in adjustments is in how the need to adjust the *Georgia-Pacific* factors is explained.[1172] The District Court erred in evaluating the *Georgia-Pacific* factors, and in not accounting for extra value caused by the standardization.[1173] The Federal Circuit therefore vacated the district court's damages award and remanded for a new determination of a reasonable royalty.[1174]

This recent decision in *CSIRO v. Cisco* allows for another method of calculating reasonable royalties for SEPs, which permits adopting specific facts in different cases. The case also reaffirmed the applicability of hypothetical negotiations and *Georgia-Pacific* factors in treating problems that arise in reasonable royalties for SEPs.[1175] However, the calculation method in *CSIRO v. Cisco* differs greatly from *Microsoft v. Motorola* and *In re Innovatio*, both of which determined that reasonable royalties are based on Wi-Fi chips.[1176] This decision therefore added to the uncertainty in how reasonable royalties for SEPs are calculated in U.S. litigation.

2. Damages Calculation Summary

American courts have a well-established infrastructure to handle SEP royalty issues. Their SEP royalty determinations have often been based on the courts' precedent. Since 2013, American courts have adjudicated a few cases concerning SEP royalty disputes, and some decisions were affirmed by appellate courts, either the Federal Circuit or Ninth Circuit in 2015. In accordance with these decisions, the following conclusions may be drawn.

Firstly, courts rely on the *Georgia Pacific* factors to calculate SEP royalty rates and range, reconstructing a hypothetical negotiation over licensing SEPs to make this determination. The court should consider only the specific and relevant factors in the case. Even though the SEP is not FRAND-encumbered, the *Georgia-Pacific* factors still should apply in the determinination with different considerations and explanations.

Secondly, in *In re Innovatio* and *Microsoft v. Motorola*, the courts developed a clear step-by-step framework to determine the SEP royalty:

(1) distribute the patents-at-issue into different families (categories), and determine whether the patents-at-issue are "essential patents";
(2) decide the importance (contribution) of the patents-at-issue to the technology standard, and examine the alternative technologies that could have been adopted into the standard;
(3) decide the importance (application) of the patents-at-issue to the accused final products;
(4) compare with a similar patent pool or license agreement base, or use a "Top Down" analytical method.

While the conclusions and rules mentioned above appear to clear, they may be too simple to be effective when used in other cases. It seems likely that more cases will occur regarding SEP royalty

---

[1171] *Id.* at 1304.
[1172] *Id.*
[1173] *Id.* at 1305-1306.
[1174] *Id.* at 1297, 1306.
[1175] *See also* Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013), Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014).
[1176] *See* Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013).

disputes. These upcoming cases will further develop the rules on what is feasible in SEP damage calculations. Particularly, the final SEP royalty tend to be based on the SSPPU (e.g. IC chips in electronic devices), as illustrated in *In re Innovatio* and *Microsoft v. Motorola*. However, the recent *CSIRO v. Cisco* is not determined on the basis of the SSPPU. How these calculations are determined continues to be an area of development and debate as courts decide how to apportion the FRAND royalty merely based on the value of the patented feature (technology), mentioned in *Ericsson v. D-Link*.

IV. Conclusion

This chapter discusses antirust and patent remedies, including injunctive relief and money damages in SEP disputes.

In antitrust enforcement, the United States government's enforcement policy has evolved between 1996 to 2009. The government's general position started with strict antitrust enforcement, and then later changed to greater tolerance. Its most recent position has been a "hands-off" approach for SEP disputes. In 2008, the court in *Rambus v. FTC* ruled that an SEP dispute was just a private dispute regarding license royalties. It was therefore inappropriate for the government to intervene in this private dispute by means of antirust enforcement actions. Under these circumstances, SEP holders may have less concerns and fewer restrictions to exploit their exclusive rights in American jurisdictions.

In addition, the United States disfavors granting SEP holders injunctive relief or exclusionary order. However, to balance the interests of patentees and SEP holders, federal agencies and the courts have permitted a few exceptions to their general position by creating new exceptions within their administrative regulations (i.e. the DOJ and USPTO 2013 Policy Statement) and judicial decisions (i.e. *Apple v. Motorola* in 2014). Despite these examples, the government's general position restrains SEP holders' exclusive rights, allowing standard implementers to face fewer threats of injunction.

Finally, the method of deciding FRAND royalties remains an issue of public debate and is being slowly developed in the courts. The recent *Microsoft v. Motorola* and *In re Innovatio* cases illustrate an evolving framework of determining FRAND royalty rates and ranges. Under this developing framework, the courts first determine the essentiality and related families of the patents-at-issue, then discuss the families' importance to the technology standard (and the final products), and finally compare them with other patent pools or license agreements. Thus, the calculation is always based on the patented feature of the technology, and the royalty base is often the SSPPU (e.g. IC chips) of the final product. Despite this seemingly clear rule, the methodology for applying it remains unclear, and some other alternative method remains existing to calculate reasonable royalties for SEPs. More cases will be needed to reach clearer rules that would work in a wide variety of situations. Time will tell how the courts ultimately calculate FRAND royalties.

The next chapter (Chapter 6) will examine Chinese SEP regulations. The United States and China have distinct historical backgrounds, cultural development, and economic situations. Unlike the United States, China is an IPR-importing country and its corporations are often standard-receivers. Furthermore, it has been fewer than 35 years since China has established its patent and antitrust system. These differences in law and legal institutions will be discussed in the following chapter, Chapter 6.

Chapter 6 SEP Regulations in China

I. Introduction

This chapter will provide an overview of current Chinese laws on standard essential patents ("SEPs"). Current laws governing SEPs in China come in a variety of forms, including administrative agency decisions, administrative agency guidelines administrative regulations, legislation, judicial decisions, and judicial interpretations (as shown in Table 6-1). China is a civil law country. As a result, many of the Chinese laws governing SEPs are based on general principles as opposed to specific facts in case law. For example, the Standardization Administration of China ("SAC") and the State Intellectual Property Office ("SIPO") issued the *Regulatory Measures on National Standards Involving Patents (Interim)* (hereinafter "SAC and SIPO Measures on National Standards Involving Patents").[1177] The State Administration for Industry and Commerce ("SAIC") also issued *Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property ("IP") to Preclude or Restrict Competition* (hereinafter "SAIC Provisions on Prohibiting IP Abuse").[1178] In contrast, the United States merely uses administrative guidelines issued by federal agencies to address SEPs. Neither Congress nor the administrative agencies in the United States have established laws or regulations to govern SEP disputes. Because the Chinese government applies different general principles derived from existing and proposed legislation, administrative regulations and guidelines, and judicial interpretations, China offers an interesting contrast to the United States in how to handle the SEP problem.

Table 6-1: Evolving SEP Regulations in China

Year.Mo	Name	Administrative			Legislative	Judicial		Issue	
		Decision	Regulation	Guideline		Interpretation	Decision	Remedy	Antitrust
1997.2	*Tianjin Harbour Engineering Research Institute v. Comprehensive Institute of Geotechnical Investigation & Surveying* [i]						X	X	
2008.7	*Ji Qiang, Liu Hui v. Chaoyang Xingnuo* [ii]						X	X	
2009.10	Patent Law 3rd Reform (in Chapter 6) [iii]				X				X
2013.10	*Huawei v. InterDigital* [iv]						X	X	X
2014.1	SAC and SIPO Measures on National Standards Involving Patents [v]		X					X	
2014.1	*Zhang Jingting v. Hengshui Ziyahe* [vi]						X	X	
2015.2	*In re Qualcomm* [vii]	X							X
2015.2	Supreme People's Court 2015 Judicial Interpretation (drafted) [viii]					X		X	
2015.4	Patent Law 4th Reform (drafted) (in Article 85) [ix]				X			X	
2015.8	SAIC Provisions on Prohibiting IP Abuse [x]		X						X
2015.10	Antimonopoly Guidelines for IP Abuse (drafted) [xi]			X					X

[1177] WANG YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 25, 105 (2014).

[1178] *See* Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3, Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 43.

i. Tianjin Gangwan Gongcheng Yanjiusuo Su Zonghe Kancha Yanjiu Shejiyuan (天津港湾工程研究所诉综合勘察研究设计院) [Tianjin Harbour Engineering Research Institute v. Comprehensive Institute of Geotechnical Investigation & Surveying] ((1996)二中知初字第 49 号)[No. 49 (1996) of the Beijing No.2 Intermediate People's Court](Beijing No.2 Interm. People's Ct. Feb. 18, 1997).

ii. Ji Qiang yu Liu Hui Su Chaoyang Xingnuo Jianzhu Gongcheng Youxian Gongsi (季强与刘辉诉朝阳兴诺建筑工程有限公司)[Ji Qiang, Liu Hui v. Chaoyang Xingnuo Constr. Ltd.] (最高人民法院(2008)民三他字第 4 号) [No. 4 (2008) of the Supreme People's Court) (Sup. People's Ct. Jul. 8, 2008).

iii. Zhuanli Fa (专利法) [Patent Law] (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008, effective Oct. 1, 2009) 2009 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 27 (China).

iv. Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013), Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).

v. Guojia Biaozhun Sheji Zhuanli de Guanli Guiding (国家标准涉及专利的管理规定 (暂行))[Regulatory Measures on National Standards Involving Patents (Interim)] (promulgated by the Standardization Admin. China & St. Intell. Prop. Off., Dec. 19, 2013, effective Jan. 1, 2014), http://www.sipo.gov.cn/zcfg/flfg/zl/bmgfxwj/201401/t20140103_894910.html (China).

vi. Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (最高人民法院(2012)民提字第 125 号) [No. 125 (2012) of the Supreme People's Court] (Sup. People's Ct. Jan. 2, 2014).

vii. Gaotong Gongsi Feifa Longduan An (高通公司非法垄断案) [In re Qualcomm Inc. Unlawful Antimonopoly] (发改办价监处罚[2015] 1 号) [No. 1 [2015] of the National Development and Reform Commission] (Nat'l Dev. & Reform Comm'n Feb. 9, 2015).

viii. Zuigao Renmin Fayuan Guanyu Shenli Qinfan Zhuanliquan Jiufen Anjian Yingyong Falv Ruogan Wenti de Jieshi Er Zhengqiu Yijian Gao (最高人民法院关于审理侵犯专利权纠纷案件应用法律若干问题的解释(二)(征求意见稿)) [Interpretation of the Supreme People's Court on Several Issues concerning the Application of Law in the Trial of Patent Infringement Dispute Cases (Part Two)(Draft for Asking Comments)], http://www.hfiplaw.cn/?p=2809 (China).

ix. Zhonghua Renmin Gongheguo Zhuanli Fa Xiuding Caoan Songshen Gao (中华人民共和国专利法修订草案(送审稿)) [Drafted Amendment of Patent Law of People's Republic of China (Draft for Approval)], http://www.chinalaw.gov.cn/article/cazjgg/201512/20151200479591.shtml (China).

x. Guojia Gongshang Xingzheng Guanli Zongju Guanyu Jinzhi Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei de Guiding (国家工商行政管理总局关于禁止滥用知识产权排除、限制竞争行为的规定) [Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition] (promulgated by the St. Admin. Indus. & Com., Apr. 7, 2015, effective Aug. 1, 2015) ST. COUNCIL GAZ., Jun. 20, 2015, at 11 (China).

xi. Guanyu Lanyong Zhishichanquan de Fanlongduan Zhinan Zhengqiu Yijian Gao (关于滥用知识产权的反垄断指南(征求意见稿)) [Antimonopoly Guidelines for the Abuse of Intellectual Property (Draft for Asking Comments)], http://www.sdpc.gov.cn/gzdt/201512/t20151231_770313.html (China).

Source: Compiled by the author

In addition, Chinese SEP regulations evolved in a different order from the United States. As discussed in Chapter 5, American SEP regulations started with public antitrust disputes and later transitioned into private patent infringement disputes. In China though, SEP regulations began with

private patent disputes.[1179] It was not until the Chinese government issued its *Antimonopoly Law* in 2008 that SEP antitrust issues began to appear in different Chinese jurisdictions.[1180]

Unlike the United States, China did not experience a transition from public to private disputes in regulating SEPs. Because China lacks an independent judiciary, the court's resolution of both public antitrust and private patent remedy issues are subject to oversight by the Chinese Communist Party ("CCP"). These policies on public antitrust and private patent remedy are still being developed. Since the National Development and Reform Commission ("NDRC") issued the *In re Qualcomm* decision in February of 2015, Chinese governance of SEPs has been moving towards a stronger emphasis on antimonopoly instead of private property rights.[1181] Many of the rules developed since *In re Qualcomm* are simply drafts, though they may shed light on the Chinese government's current position on SEPs.[1182]

The following section will discuss by category these evolving Chinese SEP regulations. Patent infringement disputes first emerged in Chinese courts. The first part will discuss the issue of remedy, how courts decide damages and how courts decide whether to grant an injunction. The second part will then discuss the antitrust issue, which began to emerge after China issued its *Antimonopoly Law* in 2008. This part will discuss the government's criteria for intervention in SEP disputes through an analysis of antitrust regulations. The last part will draw conclusions about China's SEP regulations, even though the issue of remedy and antitrust are still developing in China.

II. **Patent Remedies**

[1179] Tianjin Gangwan Gongcheng Yanjiusuo Su Zonghe Kancha Yanjiu Shejiyuan (天津港湾工程研究所诉综合勘察研究设计院) [Tianjin Harbour Engineering Research Institute v. Comprehensive Institute of Geotechnical Investigation & Surveying] ((1996)二中知初字第 49 号)[No. 49 (1996) of the Beijing No.2 Intermediate People's Court](Beijing No.2 Interm. People's Ct. Feb. 18, 1997).

[1180] Fanlongduan Fa (反垄断法) [Antimonopoly Law] (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 30, 2007, effective Aug. 1, 2008) 2007 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 517 (China).

[1181] *See*, *e.g.*, Guojia Gongshang Xingzheng Guanli Zongju Guanyu Jinzhi Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei de Guiding (国家工商行政管理总局关于禁止滥用知识产权排除、限制竞争行为的规定) [Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition] (promulgated by the St. Admin. Indus. & Com., Apr. 7, 2015, effective Aug. 1, 2015) ST. COUNCIL GAZ., Jun. 20, 2015, at 11 (China), Guanyu Lanyong Zhishichanquan de Fanlongduan Zhinan Zhengqiu Yijian Gao (关于滥用知识产权的反垄断指南(征求意见稿)) [Antimonopoly Guidelines for the Abuse of Intellectual Property (Draft for Asking Comments)], http://www.sdpc.gov.cn/gzdt/201512/t20151231_770313.html (China). The National Development and Reform Commission ("NDRC") is currently one of the key ministries under State Council. The NDRC's primary functions include: developing and implementing macroeconomic policies, monitoring the national economy, approving major construction projects impacting the economy, guiding and promoting economic restructuring, managing the readjustment of China's industrial structure, promoting the development of agriculture and rural economy, developing plans for the energy sector and managing national oil reserves, promoting investment in the western, central, and northeast regoins of China, and submitting a national economic plan annually to the National People's Congress ("NPC"). JAMES M. ZIMMERMAN, CHINA LAW DESKBOOK: A LEGAL GUIDE FOR FOREIGN-INVESTED ENTERPRISES 67, footnote 32 (4th ed. 2014).

[1182] *See*, *e.g.*, Guanyu Lanyong Zhishichanquan de Fanlongduan Zhinan Zhengqiu Yijian Gao (关于滥用知识产权的反垄断指南(征求意见稿)) [Antimonopoly Guidelines for the Abuse of Intellectual Property (Draft for Asking Comments)], http://www.sdpc.gov.cn/gzdt/201512/t20151231_770313.html (China).

China first established its *Patent La*w in 1984, and then revised the *Patent Law* in 1992, 2000, and 2008.[1183] Despite these changes, many aspects of patent protection and enforcement in China are still widely criticized by foreign enterprises and foreign governments.[1184] The governance of SEPs raises many complex and challenging problems. Since the Chinese government still struggles to deal with basic patent law problems, it is unclear how the Chinese government will be able to handle issues raised by SEPs. In addition, as a late-comer to the technological field, China has become an IP-importing, standard-receiving nation.[1185] Consequently, some Chinese academies and companies regard SEPs as "technology traps" or "patent traps."[1186] When balancing its patent system with standardization policies, the Chinese government often faces a dilemma of whether to protect its domestic industries or harmonize its patent system with international standards.[1187]

Unlike the United States, China's *Patent Law* has only existed for approximately 30 years. China did not offer damage provisions in its *Patent Law* when the law was first enacted in 1984.[1188] It was not until the year 2000 that China implemented damage provisions.[1189] Since 2000, and in light of Article 60, damage calculations have been based on the patentee's lost profits or infringer's earned

---

[1183] *See* ZHANG CHU & XU XINGXIANG, CHINA PATENT LEGAL SYSTEM AND PRACTICE 5, 6, 8, 12 (2010).

[1184] *See* U.S. CHAMBER OF COMMERCE, CHINA'S WTO IMPLEMENTATION AND OTHER ISSUES OF IMPORTANCE TO AMERICAN BUSINESS IN THE U.S.-CHINA COMMERCIAL RELATIONSHIP 4 (2005), Alan Zimmerman & Peggy E. Chaudhry, *Protecting Intellectual Property: The Special Case of China*, 10 J. ASIA-PAC. BUS. 308, 308 (2009), U.S. TRADE REPRESENTATIVE, 2014 SPECIAL 301 REPORT 2 (2014), NAT'L BUREAU OF ASIAN RESEARCH, THE IP COMMISSION REPORT: THE REPORT OF THE COMMISSION ON THE THEFT OF AMERICAN INTELLECTUAL PROPERTY 1-2 (2013).

[1185] *See* ZHU GUOHUA (朱国华), GAOXIN JISHU CHANYEHUA DE ZHUANLI, BIAOZHUN YU RENCAI ZHANLUE (高新技术产业化的专利,标准与人才战略) [STRATEGY OF PATENT, STANDARD, AND COMPETENT PERSON IN HIGH-TECH INDUSTRIALIZATION] 159 (2010).

[1186] *See* RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 10-12 (2006), RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM 4, 11, 12(2004).

[1187] *See* Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 69, Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013).

[1188] Liu Yuanshan, Yu Xiubao & Li Chuanwen (刘远山, 余秀宝, 李伟文), *Woguo Zhuanli Qinquan Sunhai Peichange Jisuan Fangfa Shiyong Lunyao* (我国专利侵权损害赔偿额计算方法适用论要) [*Some Mainly Discusses about the Applicable of Calculation Methods of Patent Infringement Damages*], XINGZHENG YU FA (行政与法) [PUB. ADMIN. & LAW], no.1, 2011, at 115, 115.

[1189] Prior to 2000, the Chinese courts followed the Guanyu Shenli Zhuanli Jiufen Anjian Ruogan Wenti de Jieda (关于审理专利纠纷案件若干问题的解答) [Answers to Several Issues Concerning the Adjudication of Patent Dispute Cases] to handle the issue of patent damages. The guidelines were issued by the Supreme People's Court ("SPC") in 1992. In light of the 1992 guidelines, the patent damage calculation could be based on: (1) the patentee's lost profits caused by the patent infringement, (2) the infringer's earned profits due to the patent infringement, and (3) reasonable royalties. Courts had discretion to use any of these three considerations to calculate damages. In 2000, the Chinese government codified the SPC's guidelines mentioned above. After the Chinese government codified the guidelines, these provisions became the damage provisions of China's Patent Law. *See id.*, Zheng Wenyan(郑文艳), *Zhongguo Zhuanli Qinquan Sunhai Peichang Guiding de Lishi Huigu he Fazhan Jianyi* (中国专利侵权损害赔偿规定的历史回顾和发展建议) [*The History Review of and Development Suggestion on China's Patent Damage Provisions*], FAZHI YU SHEHUI (法制与社会) [LEGAL SYS. & SOC'Y], no.6, 2009, at 349, 349.

profits as a result of the infringement. When the lost profits or earned profits are too difficult to determine, the calculation can be decided on the basis of a multiple on royalties.[1190] Even though China has made progress in implementing this new provision in its *Patent Law*, Article 60 has still been criticized for its application sequence and ambiguity.[1191] Fortunately, when China revised its *Patent Law* in 2008, China also revised its damages provision.[1192] The 2008 damages provision in the *Patent Law* is the most recent change to the law.

Article 65 of China's *Patent Law* provides four methods and the order in which these methods are applied to calculate damage compensation for patent infringement. The methodology is as follows:[1193]

(1) the damage calculation is based on the patentee's actual losses caused by the infringement;
(2) if the actual losses are hard to determine, the compensation amount may be determined according to the benefits the infringer acquired through the infringement;
(3) if the patentee's losses and infringer's benefits are both hard to determine, the compensation amount may be determined according to a reasonable, multiplied amount of the patent's royalties;
(4) if the patentee's losses, infringer's benefits, patent's royalties are all too difficult to determine, courts may award damages within the statutory range of 10,000 RMB to 1,000,000 RMB.

While the Chinese government has made progress in improving its patent law system, actual enforcement of damages awards is still problematic and has been criticized by patentees.

- The most common criticism is that when Chinese courts calculate the damage compensation in actual cases, 95% of the time the court will employ the statutory damage

---

[1190] *Available at* http://www.sipo.gov.cn/ztzl/zxhd/ayyip/gfwj/fl/200804/t20080417_382708.html (last visit date: April 8, 2015).

[1191] Liu Yuanshan, Yu Xiubao & Li Chuanwen (刘远山, 余秀宝, 李伟文), *Woguo Zhuanli Qinquan Sunhai Peichange Jisuan Fangfa Shiyong Lunyao* (我国专利侵权损害赔偿额计算方法适用论要) [*Some Mainly Discusses about the Applicable of Calculation Methods of Patent Infringement Damages*], XINGZHENG YU FA (行政与法) [PUB. ADMIN. & LAW], no.1, 2011, at 115, 115.

[1192] In 2001, the SPC also issued guidelines to clarify Art. 60. The SPC's guidelines were called Guanyu Shenli Zhuanli Jiufen Anjian Shiyong Falü Wenti de Ruogan Guiding (关于审理专利纠纷案件适用法律问题的若干规定) [Several Provisions Regarding the Issues Concerning the Application of Law in the Trial of Patent Dispute Cases]. In the guidelines, the SPC added a new method to decide damage compensation. The 2001 guidelines required the courts to first consider the patentee's lost profits or infringer's acquired profits as a result of the infringement. When these two (i.e. patentee's loss and infringer's benefit) are too difficult to determine, the court may determine the compensation amount based on one to three times the patent royalties. However, if the patent's royalty has no comparable reference or the royalty is not reasonable, courts may determine the compensation within the range of 5,000 RMB to 300,000 RMB, not to exceed 500,000 RMB. *See id.*

[1193] In 2001, the SPC also issued guidelines to clarify Art. 60. The SPC's guidelines were called Guanyu Shenli Zhuanli Jiufen Anjian Shiyong Falü Wenti de Ruogan Guiding (关于审理专利纠纷案件适用法律问题的若干规定) [Several Provisions Regarding the Issues Concerning the Application of Law in the Trial of Patent Dispute Cases]. In the guidelines, the SPC added a new method to decide damage compensation. The 2001 guidelines required the courts to first consider the patentee's lost profits or infringer's acquired profits as a result of the infringement. When these two (i.e. patentee's loss and infringer's benefit) are too difficult to determine, the court may determine the compensation amount based on one to three times the patent royalties. However, if the patent's royalty has no comparable reference or the royalty is not reasonable, courts may determine the compensation within the range of 5,000 RMB to 300,000 RMB, not to exceed 500,000 RMB. *See id.*

method described in Article 65(4).[1194] In practice, the other three calculation methods described in Article 65 (1), (2), and (3) do not play important roles in Chinese courts.

- In addition, patentees criticize the court's calculation of damages because courts seldom include a written rationale for their decisions and fail to explain their use of the statutory damage method in deciding compensation.[1195] Under Article 65, the key factors a court should consider when calculating damages are the type of patent rights, nature of the infringement, and seriousness of the case. However, since the courts rarely record the specific factors or standards that contribute to their decisions, this results in unpredictability for future cases.[1196]
- Finally, about 91.8% of damage compensation awards result in an award of less than 200,000 RMB.[1197] Patentees believe this does not compensate them actual damages and may not even be enough to cover litigation costs.[1198] Critics find enforcement of the law ineffective in compensating losses and deterring future infringement.

In addition to its system for calculating damages for infringement, China's system of injunction relief also faces serious criticism. When China's *Patent Law* was first enacted in 1984, the law did not offer injunctions as a form of relief. It was not until 2000 when China included Article 61 did injunctions become incorporated into patent infringement relief.[1199] In 2008, China revised its *Patent Law* again and provided more detail on injunctions in Article 66.[1200] However, under both the 2000 and 2008 versions of the Chinese *Patent Law*, the patentee can only file for an injunction before litigation begins.[1201] At present, it is unclear whether a patentee may file for an injunction

---

[1194] Liu Qiang, Shen Lihua & Ma Deshuai (刘强, 沈立华, 马德帅), *Woguo Zhuanli Qinquan Sunhai Peichang Shue Shizheng Yanjiu* (我国专利侵权损害赔偿数额实证研究) [*Empirical Study of the Patent Infringement Damage in China*], WULING XUEKAN (武陵学刊) [J. WULING], no.5, 2014, at 78, 81, Yin Zongping(殷宗萍), *Zhuanli Qinquan Sunhai Peichang de Lifa ji Sifa Shijian Yanjiu- Cong Zhongguo yu Meiguo Bijiao de Shijiao* (专利侵权损害赔偿的立法及司法实践研究- 从中国与美国比较的视角) [*Legislative and Judicial Research of Patent Infringement Damage- China and United States Comparison*], ZHONGGUO GAOXIN JISHU QIYE (中国高新技术企业) [CHINA HIGH-TECH ENTERPRISES], no.27, 2012, at 145, 146, Liu Yunyun (刘筠筠), *Zhuanli Qinquan Sunhai Peichang Wenti de Tansuo yu Bijiao Yanjiu* (专利侵权损害赔偿问题的探索与比较研究) [*Exploration and Comparative Study of Patent Infringement Damage*], SHANGYE SHIDAI (商业时代) [COM. TIMES], no.14, 2014, at 124, 124.

[1195] Liu Qiang, Shen Lihua & Ma Deshuai (刘强, 沈立华, 马德帅), *Woguo Zhuanli Qinquan Sunhai Peichang Shue Shizheng Yanjiu* (我国专利侵权损害赔偿数额实证研究) [*Empirical Study of the Patent Infringement Damage in China*], WULING XUEKAN (武陵学刊) [J. WULING], no.5, 2014, at 78, 81.

[1196] *See id.*, Yin Zongping(殷宗萍), *Zhuanli Qinquan Sunhai Peichang de Lifa ji Sifa Shijian Yanjiu- Cong Zhongguo yu Meiguo Bijiao de Shijiao* (专利侵权损害赔偿的立法及司法实践研究- 从中国与美国比较的视角) [*Legislative and Judicial Research of Patent Infringement Damage- China and United States Comparison*], ZHONGGUO GAOXIN JISHU QIYE (中国高新技术企业) [CHINA HIGH-TECH ENTERPRISES], no.27, 2012, at 145, 146.

[1197] Liu Qiang, Shen Lihua & Ma Deshuai (刘强, 沈立华, 马德帅), *Woguo Zhuanli Qinquan Sunhai Peichang Shue Shizheng Yanjiu* (我国专利侵权损害赔偿数额实证研究) [*Empirical Study of the Patent Infringement Damage in China*], WULING XUEKAN (武陵学刊) [J. WULING], no.5, 2014, at 78, 81.

[1198] *Id.* at 83.

[1199] Sun Hailong & Yao Jianjun, *A Comparative Study of System of Patent Preliminary Injunction in China and United States,* 3 CHINA PAT. & TRADEMARKS 28, 30 (2008).

[1200] Art. 66 of the Patent Law.

[1201] *See* Deng Zhuo(邓卓), *Lun Woguo Zhishichanquan Jinling Zhidu de Wanshan* (论我国知识产权禁令制度的完善) [*On Perfection of IP Injunction of China*], ZHISHICHANQUAN (知识产权) [INTELL. PROP.], no.9, 2013, at 47, 48-49.

while the litigation is ongoing or even after judgment.[1202] Patentees criticize the injunction system as incomplete, with vague standards when a court may grant an injunction.[1203] Given this situation, SEP holders have grave concerns as to whether they can protect their rights through injunctive relief.

China's patent remedy system and its enforcement mechanisms remain nascent, so it will take time for the system to mature. The Chinese government is still developing its patent remedy system. It is therefore difficult to predict how the Chinese government will protect SEPs, particularly SEPs that have great impact on China's domestic industry. Despite this uncertainty, SEP disputes continue to be litigated in Chinese courts. China needs to make a decision now about how best to handle patent remedies in SEP disputes, even though it has not yet completed the development of the whole patent law system.

Table 6-2 offers a summary of Chinese regulations relevant to SEP remedies as they have been developed so far. Most of the development of SEP remedies analysis has taken place in the Chinese courts. SEP disputes have been litigated in Chinese courts from as early as 1997. Yet this field is still developing in China's courts today. The leading case *Huawei v. InterDigital* is still pending a decision in the Supreme People's Court ("SPC"). In addition to relying on judicial decisions and interpretation of the court's intent to resolve SEP's remedy problem, the Chinese government also relies on its administrative regulations to decide remedies. These judicial decisions, drafted judicial interpretations, administrative regulations, and proposed *Patent Law* reform are discussed in more detail below, followed by a summary of these developing SEP regulations.

Table 6-2: Evolving SEP Remedy Regulations in China

Year.Mo	Name	Administrative			Legislative	Judicial	
		Decision	Regulation	Guideline		Interpretation	Decision
1997.2	*Tianjin Harbour Engineering Research Institute ("THEIR") v. Comprehensive Institute of Geotechnical Investigation & Surveying ("CIGIS")*						X
2008.7	*Ji Qiang, Liu Hui v. Chaoyang Xingnuo*						X
2013.10	*Huawei v. InterDigital*						X
2014.1	SAC and SIPO Measures on National Standards Involving Patents		X				
2014.1	*Zhang Jingting v. Hengshui Ziyahe*						X
2015.2	SPC 2015 Judicial Interpretation (drafted)					X	
2015.4	Patent Law 4th Reform (drafted) (in Article 85)				X		

[1202] *See id.*, Xue Lin (薛林), *Lun Zhuanli Qinquan Jiuji zhong de Tingzhi Qinhai Zhidu* (论专利侵权救济中的停止侵害制度) [*Cessation of Infringement in Patent Law System*], ZHONGGONG YINCHUAN SHIWEI DANGXIAO XUEBAO (中共银川市委党校学报), [J. YINCHUAN MUN. PARTY C. C.P.C], no.4, 2011, at 71, 71-72, Xu Jianchu (须建楚), *Zhishichanquan Shenpan zhong Jinling de Shiyong* (知识产权审判中禁令的适用) [*Applying Injunction in Intellectual Property Trials*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2003, at 46, 46.

[1203] *See* Sun Hailong & Yao Jianjun, *A Comparative Study of System of Patent Preliminary Injunction in China and United States,* 3 CHINA PAT. & TRADEMARKS 28, 31-32 (2008), Deng Zhuo(邓卓), *Lun Woguo Zhishichanquan Jinling Zhidu de Wanshan* (论我国知识产权禁令制度的完善) [*On Perfection of IP Injunction of China*], ZHISHICHANQUAN (知识产权) [INTELL. PROP.], no.9, 2013, at 47, 48-50, 59, Xu Jianchu (须建楚), *Zhishichanquan Shenpan zhong Jinling de Shiyong* (知识产权审判中禁令的适用) [*Applying Injunction in Intellectual Property Trials*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2003, at 46, 49, 6

Source: Compiled by the author

A. Judicial Decisions, Interpretation

1. THERI v. CIGIS (Beijing No.2 Interm. People's Ct. 1997)

The SEP owner ultimately was prohibited from asking for relief through the judicial system. In this case, the patented technology at issue was a "method of vacuum preloading," used to consolidate soft soils (Patent No. 85,108,820) ("820 Patent").[1204] The patentee was Tianjin Harbour Engineering Research Institute ("THERI").[1205] In July 1996, THERI brought a lawsuit to Beijing No.2 Intermediate People's Court, arguing that its patent was infringed by the Comprehensive Institute of Geotechnical Investigation & Surveying ("CIGIS").[1206] CIGIS argued that (1) the court should invalidate the 820 Patent due to lack of novelty, and (2) that the court should suspend the proceedings because the 820 Patent was already incorporated into mandatory standards.[1207] The court ultimately found that the 820 Patent was invalid because the patented technology had been published and used before the 820 Patent was even filed.[1208] This was the first PRC court ruling related to SEP disputes. Issuing the decision in 1997, the Chinese court suspended the proceedings partly because the issue of validity had been argued previously.

More importantly though, the court highlighted that even if the 820 Patent remained valid, the court would have still suspended proceedings.[1209] The court reasoned that because the 820 Patent was incorporated into mandatory technical specifications, rendering a decision would be moot.[1210] In this case, the patented technology was incorporated into two construction standards issued by the Ministry of Construction ("MoC").[1211] These construction standards were mandatory standards under the *Standardization Law* and *Regulations for the Implementation of the Standardization Law,* requiring compliance as if China's administrative regulations.[1212] Before the lawsuit had even been initiated, numerous other enterprises were already constructing their products using these

[1204] Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 75.
[1205] *Id.*
[1206] *See Id.*
[1207] *See* BEIJINGSHI ZHISHICHANQUAN JU (北京市知识产权局) [BEIJING INTELLECTUAL PROPERTY OFFICE], ZHUANLI JIUFEN ANJIAN PINGXI (专利纠纷案件评析)[ANALYZING PATENT DISPUTE CASES] 50-52 (2005).
[1208] *See id.* at 50-51.
[1209] *See id.* at 52, Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 75.
[1210] *See* Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 75. *See* Chapter 4 for further discussion regarding the mandatory technical specifications.
[1211] *Id.*
[1212] *Id.*, BEIJINGSHI ZHISHICHANQUAN JU (北京市知识产权局) [BEIJING INTELLECTUAL PROPERTY OFFICE], ZHUANLI JIUFEN ANJIAN PINGXI (专利纠纷案件评析)[ANALYZING PATENT DISPUTE CASES] 51 (2005).

mandatory technical specifications.[1213] Had THERI been able to successfully argue the 820 Patent, the interests of an indefinite number of third parties would have been involved.[1214]

The court noted another problematic issue with the 820 Patent. When the MoC first drafted the at-issue standard, THERI had participated in the standard-seting process yet never disclosed its interest in the 820 Patent.[1215] THERI's arguement of the 820 Patent only after the standards were put into force violate the principles of "fairness" and "honesty and credibility" as provided by the General Principles of the *Civil Law.*[1216]

Under these circumstances, the court did not treat *THERI v. CIGIS* as a general patent infringement case.[1217] Rather, the court considered the case as an example of a special condition for patents to be incorporated into mandatory standards.[1218] As a result, the patentee THERI was unable to protect its rights through the courts.

2. Ji Qiang, Liu Hui v. Chaoyang Xingnuo (Sup. People's Ct. 2008)

Ji Qiang, Liu Hui v. Chaoyang Xingnuo was the first SEP infringement case involving the SPC. When the Liaoning High People's Court referred the SEP issue to the SPC,[1219] the SPC issued a judicial reply.[1220] Although the SPC's judicial reply was written for this specific case, the judicial reply included many instructions for reference in future cases concerning SEP disputes.[1221]

The at-issue patented technology in *Ji Qiang, Liu Hui v. Chaoyang Xingnuo* was concerning a design for ram-compaction piles with a composite bearing base.[1222] This technology was incorporated into a specification—an industry standard issued by the Ministry of Construction.[1223] Chaoyang Xingnuo Corporation conducted its designs and constructions in light of the industry

---

[1213] *See id*. at 51-52.

[1214] *See id*. at 51, Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 75.

[1215] *See* BEIJINGSHI ZHISHICHANQUAN JU (北京市知识产权局) [BEIJING INTELLECTUAL PROPERTY OFFICE], ZHUANLI JIUFEN ANJIAN PINGXI (专利纠纷案件评析)[ANALYZING PATENT DISPUTE CASES] 53 (2005).

[1216] *See id.*

[1217] Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 75.

[1218] *Id.*

[1219] Ji Qiang yu Liu Hui Su Chaoyang Xingnuo Jianzhu Gongcheng Youxian Gongsi (季强与刘辉诉朝阳兴诺建筑工程有限公司)[Ji Qiang, Liu Hui v. Chaoyang Xingnuo Constr. Ltd.] (最高人民法院(2008)民三他字第 4 号) [No. 4 (2008) of the Supreme People's Court) (Sup. People's Ct. Jul. 8, 2008).

[1220] In PRC jurisdiction, "a judicial reply is a reply issued by a higher court in response to inquiries from a lower court regarding the handling of specific legal issues. A judicial reply is generally binding on lower courts." D. Daniel Sokol & Wentong Zheng, *FRAND in China*, 22 TEX. INTELL. PROP. L. J. 71, footnote 110 (2013).

[1221] Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 76.

[1222] Ji Qiang yu Liu Hui Su Chaoyang Xingnuo Jianzhu Gongcheng Youxian Gongsi (季强与刘辉诉朝阳兴诺建筑工程有限公司)[Ji Qiang, Liu Hui v. Chaoyang Xingnuo Constr. Ltd.] (最高人民法院(2008)民三他字第 4 号) [No. 4 (2008) of the Supreme People's Court) (Sup. People's Ct. Jul. 8, 2008).

[1223] *Id.*

standard.[1224] Later, Ji Qiang and Liu Hui alleged that Chaoyang Xingnuo infringed the patent when implementing the industry standard. Chaoyang Xingnuo then raised an SEP defense in the proceedings, and the Liaoning High People's Court referred this question to the SPC.

The SPC held that the activity involved did not constitute a patent infringement. The SPC stated in the judicial reply that: "In view of the actual situation that the standard-setting bodies in China have not established the relevant rules on the public disclosure and use of patent information in a relevant standard, if a patentee has participated in setting a standard or has agreed to bring his patent into a state, industry or local standard, it shall be deemed that the patentee has permitted others to exploit such a patent while implementing the standard, and therefore that the relevant exploitation by others shall not constitute the patent infringement prescribed in Article 11 of the *Patent Law*. The patentee may require the person exploiting the patent to pay a certain royalty, which, however, shall be evidently less than the normal royalty; if the patentee agrees to give up royalties, his agreement shall be followed."[1225] In light of the judicial reply, the Liaoning High People's Court ultimately ruled that Chaoyang Xingnuo did not infringe the at-issue SEP, though they were required to pay 40,000 RMB as a royalty fee.[1226]

Even though the SPC's judicial reply has great impact on subsequent SEP disputes, scholars criticize the judicial reply for its ambiguity.[1227] For example, it is ambiguous what "participation in standard-setting" means.[1228] The phrase "the royalty should be evidently less than the normal royalty" is also unclear.[1229] Scholars are uncertain as to how the courts decide whether the SEP royalty was "evidently less than" the normal royalty. Despite the ambiguity, the SPC's judicial reply marks a milestone for SEP protections in China. In 1997, the *THERI v. CIGIS* decision deprived SEP holders of their litigation rights. In 2008, the *Ji Qiang, Liu Hui v. Chaoyang Xingnuo* case signified that SEP holders could at least protect their rights through the courts, even though the protection is still incomplete.

3. Huawei v. InterDigital (Guangdong High People's Ct. 2013)

As of this writing, the *Huawei v. InterDigital* case is referred to as the top SEP case in China.[1230] This was the first time that a Chinese court officially used the term "standard essential patent ('SEP')" in a decision.[1231] Because of its significance and influence, the case was selected by the SPC

[1224] *Id.*

[1225] *Id.* The letter's translation is *available at* http://www.lawinfochina.com/display.aspx?lib=law&id=7154&CGid= (last visit date: Mar. 19, 2015).

[1226] Li Jiang et al. (李江等), *Zhongguo Zhuanli Moshi Xuke Shijian Tanjiu* (中国专利默示许可实践探究) [*Probing into Practice Relevant to Implied Patent License in China*], ZHONGGUO ZHUANLI YU SHANGBIAO (中国专利与商标) [CHINA PATENTS & TRADEMARKS], no.4, 2014, at 67, 69.

[1227] *See* Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 76.

[1228] *See id.*

[1229] *See id.*

[1230] Zhang Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3, 4 (2014).

[1231] *See* Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013), Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v.

as one of the "Top 10 IP cases in China in Year 2013."[1232] The case marked the first time that a Chinese court applied the rule of "fair, reasonable, and non-discriminatory ('FRAND')" to decide the reasonable royalty rate of SEPs.[1233]

Huawei Corporation is the main telecommunication equipment provider in China. InterDigital Corporation ("IDC") owns SEPs of telecommunication standards (including 2G, 3G, and 4G) in both the United States and China.[1234] InterDigital does not manufacture products, and the corporation's business model is only to license its patents.[1235] Joining the European Telecommunications Standards Institute ("ETSI") in September 2009, InterDigital promised to grant licenses its SEPs to standard implementers on the basis of FRAND principles.[1236] As of 2008, Huawei and InterDigital had already held four negotiations with regard to licensing InterDigital's SEPs.[1237] The license fee InterDigital charged Huawei was much higher than InterDigital charged Apple or Samsung.[1238] In the first and second negotiations, InterDigital charged Huawei a license fee as much as 100 times what it charged Apple, and as much as 10 times what it charged Samsung.[1239] In the third negotiation, InterDigital charged Huawei a licensing fee as much as 35 times what it charged Apple.[1240] In the fourth negotiation, InterDigital still charged Huawei a license fee as much

---

InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).

[1232] Zhang Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3, 5 (2014).

[1233] Hu Hong (胡洪), *Sifa Shiye xia de FRAND Yuanze- JianPing Huawei Su IDC An* (司法视野下的 FRAND 原则-兼评华为诉 IDC 案) [*Analysis of the Principle of FRAND from Judicial Perspective Review of Huawei v. IDC Case*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 884, footnote 5.

[1234] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).

[1235] Ye Ruosi, Zhu Jianjun & Chen Wenquan (叶若思,祝建军,陈文全), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan de Rending- Ping Huawei Gongsi Su Meiguo IDC Gongsi Longduan Jiufen An* (标准必要专利权人滥用市场支配地位构成垄断的认定-评华为公司诉美国 IDC 公司垄断纠纷案) [*Determining Monopolization when Standard-essential-patent Holders Abuse their Market Dominance – Commenting the Huawei v. IDC Monopoly Dispute*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.3, 2013, at 46, 46. In *Huawei v. InterDigital*, the judges reasoned that InterDigital did not engage in any substantive production activities. The court relied heavily on this fact in its decision that InterDigital did not have a production business. D. Daniel Sokol & Wentong Zheng, *FRAND in China*, 22 TEX. INTELL. PROP. L. J. 71, 90-91 (2013).

[1236] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).

[1237] *See* Li Yang & Liu Ying (李扬&刘影), *FRAND Biaozhun Biyao Zhuanli Xuke Shiyongfei de Jisuan- Yi Zhongmei Xiangguan Anjian Bijiao wei Shijiao* (FRAND 标准必要专利许可使用费的计算- 以中美相关案件比较为视角) [*The Calculation of FRAND SEPs Licensing Royalty: A Comparison of Related Cases in China and U.S.A*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 866, footnote 4.

[1238] Zhang Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3, 7 (2014).

[1239] Li Yang & Liu Ying (李扬&刘影), *FRAND Biaozhun Biyao Zhuanli Xuke Shiyongfei de Jisuan- Yi Zhongmei Xiangguan Anjian Bijiao wei Shijiao* (FRAND 标准必要专利许可使用费的计算- 以中美相关案件比较为视角) [*The Calculation of FRAND SEPs Licensing Royalty: A Comparison of Related Cases in China and U.S.A*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 866, footnote 4.

[1240] *Id.*

as 19 times what it charged Apple.[1241] In the offer, InterDigital was to license Huawei a package of all its telecommunication patents, including SEPs and non-SEPs.[1242] InterDigital did not distinguish between SEPs and non-SEPs.[1243] InterDigital planned to offer Huawei a global, non-exclusive, and non-free license.[1244] InterDigital also required Huawei to provide a free license regarding all Huawei's patents.[1245]

In July 2011, InterDigital brought a lawsuit against Huawei in the Delaware District Court of the United States.[1246] InterDigital then requested the International Trade Commission ("ITC") to initiate a 337 investigation, and requested the ITC to grant an exclusion order against Huawei.[1247] In December 2011, Huawei brought a lawsuit against InterDigital in Guangdong Shenzhen Intermediate People's Court.[1248] In addition to its antitrust claim (discussed in the subsequent antitrust section of this chapter), Huawei asked the court to determine the SEP royalty rate and its range according to the FRAND rule.[1249] In the decision, the court held that InterDigital should license its SEPs based on the FRAND rule.[1250] This obligation would cover the whole licensing process, including negotiation, signing, and performance.[1251] To determine the FRAND royalties, the court considered factors including:[1252]

(1) the quantity, quality, and value of InterDigital's SEPs;

[1241] *Id.* The license fee charged by InterDigital, either calculated by lump-sum payments or royalty rate of involved patents, was much higher than what InterDigital charged Apple or Samsung. Zhang Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3, 7 (2014).

[1242] Ye Ruosi, Zhu Jianjun & Chen Wenquan (叶若思,祝建军,陈文全), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan de Rending- Ping Huawei Gongsi Su Meiguo IDC Gongsi Longduan Jiufen An* (标准必要专利权人滥用市场支配地位构成垄断的认定-评华为公司诉美国 IDC 公司垄断纠纷案) [*Determining Monopolization when Standard-essential-patent Holders Abuse their Market Dominance – Commenting the Huawei v. IDC Monopoly Dispute*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.3, 2013, at 46, 47.

[1243] Li Yang & Liu Ying (李扬&刘影), *FRAND Biaozhun Biyao Zhuanli Xuke Shiyongfei de Jisuan- Yi Zhongmei Xiangguan Anjian Bijiao wei Shijiao* (FRAND 标准必要专利许可使用费的计算- 以中美相关案件比较为视角) [*The Calculation of FRAND SEPs Licensing Royalty: A Comparison of Related Cases in China and U.S.A*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 866, footnote 4.

[1244] Ye Ruosi, Zhu Jianjun & Chen Wenquan (叶若思,祝建军,陈文全), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan de Rending- Ping Huawei Gongsi Su Meiguo IDC Gongsi Longduan Jiufen An* (标准必要专利权人滥用市场支配地位构成垄断的认定-评华为公司诉美国 IDC 公司垄断纠纷案) [*Determining Monopolization when Standard-essential-patent Holders Abuse their Market Dominance – Commenting the Huawei v. IDC Monopoly Dispute*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.3, 2013, at 46, 47.

[1245] *Id.*

[1246] *Id.*

[1247] *Id.*

[1248] *Id.* at 47-48.

[1249] Zhang Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3, 7 (2014), Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013) 粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013).

[1250] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013).

[1251] *Id.*

[1252] *Id.*

(2) the general license practices of the industry;
(3) the proportion of InterDigital's Chinese SEPs to InterDigital's worldwide SEPs.

In light of the principles of "fairness" and "honesty and credibility" as provided by the General Principles of the *Civil Law* and the *Contract Law*, the court eventually decided that InterDigital's SEP royalty rate should be calculated based on the final product's sale price. This royalty rate was not to exceed 0.019 percent.[1253] InterDigital appealed to the Guangdong High People's Court.[1254] The appellate court upheld the original judgment on appeal.[1255]

The judges in *Huawei v. InterDigital* also discussed several important issues regarding the FRAND commitment. The first issue was the contractual relationship between Huawei and InterDigital. The judges stated that InterDigital's FRAND commitment did not establish a contractual relationship; however, InterDigital owed Huawei FRAND obligations to license its patents.[1256] Regarding the availability of an injunction, the judges were reticent to impose an injunction if the licensee acted in "good faith" to implement the technology standard.[1257]

[1253] Zhang Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3, 9 (2014).
[1254] *Id.*
[1255] *Id.*
[1256] With regard to the issue of whether a contractual relationship exists or not, the judges in *Huawei v. IDC* held a different opinion on the FRAND disputes from other jurisdictions, including the United States and Germany. The Chinese judges indicated that in spite of the patentees' SSO participation and FRAND commitment, it was erroneous to decide that a contractual relationship had been established between the SEP holders (IDC in the case) and the standard implementers (Huawei in the case). Instead, an SEP holder owes the FRAND obligations to the potential standard implementers. This obligation resembles compulsory contracting obligations owed by such monopolistic enterprises as water, electricity, or gas supply undertakings. Zhu Jianjun & Chen Wenquan (祝建军&陈文全), *Biaozhun Biyao Zhuanli Shiyong Feilü Jiofen Juyou Kesuxing* (标准必要专利使用费率纠纷具有可诉性) [*Standard-essential-patent License Dispute Has Suability*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 4, 8. *See also* Hu Hong (胡洪), *Sifa Shiye xia de FRAND Yuanze- JianPing Huawei Su IDC An* (司法视野下的 FRAND 原则- 兼评华为诉 IDC 案) [*Analysis of the Principle of FRAND from Judicial Perspective Review of Huawei v. IDC Case*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 884, 895-896, Microsoft Corp. v. Motorola, Inc., 2012 U.S. Dist. LEXIS 170587 19-20 (W.D. Wash. Nov. 29, 2012), Microsoft Corp. v. Motorola, Inc., 696 F.3d 872, 879 (9th Cir. Wash. 2012).
[1257] In the judges' view, granting injunctions would exclude the standard implementer (or SEP user) from market competition. This exclusion would be harmful to those who relied on the standard and thus made investments, violating the theme of patent law and technology standards. The judges illustrated that it would not be considered good faith if the standard implementer drew out the negotiation process with regard to the FRAND royalty rate. However, the judges stated that a patentee's FRAND commitment does not exclude the availability of an injunction for an SEP holder. An injunction is particularly important when the standard implementer acts in bad faith. The judges proposed that Chinese courts should solve this problem on a case by case basis. Zhu Jianjun & Chen Wenquan (祝建军&陈文全), *Biaozhun Biyao Zhuanli Shiyong Feilü Jiofen Juyou Kesuxing* (标准必要专利使用费率纠纷具有可诉性) [*Standard-essential-patent License Dispute Has Suability*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 4, 8. *See also* Zhang Xuehong (张雪红), *Biaozhun Biyao Zhuanli Jinling Jiuji Zhengce zhi Gaige* (标准必要专利禁令救济政策之改革) [*Reforming the Policy of Standard-essential-patent Injunction*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.12, 2013, at 32, Shi Shaohua (史少华), *Biaozhun Biyao Zhuanli Susong Yinfa de Sikao- FRAND Yuanze yu Jinling* (标准必要专利诉讼引发的思考 FRAND 原则与禁令) [*Considerations Caused by Standard-essential-patent Litigations- FRAND Rule and Injunction*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.1, 2014, at 76, Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及

The judges also expounded the principles and factors in deciding FRAND royalties. The principles included that SEP holders are only allowed to acquire a part of, not the whole of, product profits. In addition, SEP holders are prohibited from acquiring additional benefits because of standardization.[1258] To determine FRAND royalty rates, courts should consider industry profitability, patent characteristics (e.g. quality), former license transactions, and license territory.[1259] The judges also mentioned that it is too idealistic to decide FRAND royalty rates based on each patent's value and its contribution to the final product.[1260] The court therefore calculated the FRAND royalty rate based on the sale price of final product, rather than the components or "minimum marketable unit."[1261] Finally, the court determined that the rate should not exceed 0.019 percent of the sale price of the final product.[1262]

The calculation of this 0.019 percentage rate was based on InterDigital's license rate to Apple (0.0187% of the sale price).[1263] In other words, the court compared the previous license rate InterDigital gave to Apple.[1264] The court held that the SEP holder should charge the same or similar

---

技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 74.

[1258] The judges mentioned two principles that should be considered in determining the FRAND royalty rate. The first principle is that the SEP royalties should not exceed a certain percentage of the product profits, i.e., the total amount of the royalties should be under control. The judges stated many factors, such as technology, capital, and labor, may contribute to profits, and patents are only one small element in these factors. Thus, it is in violation of FRAND when the paid royalties cause the standard implementers to take no profit. The second principle is that the SEP holder is not allowed to obtain any additional interests when its patent is incorporated into the standard. In other words, the SEP royalties should only be based on the essence of the patented technology. The SEP holder is prohibited from benefitting from the standardization. Zhu Jianjun & Chen Wenquan (祝建军&陈文全), *Biaozhun Biyao Zhuanli Shiyong Feilü Jiofen Juyou Kesuxing* (标准必要专利使用费率纠纷具有可诉性) [*Standard-essential-patent License Dispute Has Suability*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 4, 9.

[1259] The court considered the following four factors in determining the FRAND royalty rate. The first factor is the profitability of the industry (wireless telecommunication industry in the case) so that the court can decide the royalty rate for a specific product. Secondly, to ensure that the patentee's reward corresponds to its contribution to the industry, the court should consider the SEP quantity and quality, the patentee's industrial position, and the patentee's research and development investment. The third factor is to compare the patentees' previous license agreement. So, in this case, the court considered InterDigital's former license agreement with Apple and Samsung. Finally, the FRAND royalty rate should be based only on the patents granted in China, not on the patents granted worldwide. *Id.*

[1260] The judges found that it is too idealistic to calculate the FRAND rate on the basis of each individual patent. The reason was that technology standards are now covered by thousands of patents. Because no mechanism exists to assess whether these patents are essential or evaluate the quality of these patents, the judges stated that it is infeasible to decide the FRAND rate based on each patent's value and its contribution to the final product. *Id.*

[1261] *See also* Zhang Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3, 22-23 (2014).

[1262] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013).

[1263] *Id.*

[1264] Hu Hong (胡洪), *Sifa Shiye xia de FRAND Yuanze- JianPing Huawei Su IDC An* (司法视野下的 FRAND 原则-兼评华为诉 IDC 案) [*Analysis of the Principle of FRAND from Judicial Perspective Review of Huawei v. IDC Case*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 884, 894, Li Yang & Liu Ying (李扬&刘影), *FRAND*

license rate, because the transaction conditions were identical.[1265] This is the meaning of "non-discriminatory" under the FRAND commitment.[1266] However, it is questionable whether InterDigital's license to Apple and Huawei had the same transaction conditions, and even can be compared.[1267]

The decision in *Huawei v. InterDigital* was rendered by the Guangdong Shenzhen Intermediate People's Court and has been upheld by the Guangdong High People's Court.[1268] The case is now pending before the SPC.

4. Zhang Jingting v. Hengshui Ziyahe (Sup. People's Ct. 2014)

While the *Huawei v. InterDigital* case was pending before the SPC, the SPC rendered its first official decision regarding SEP disputes in *Zhang Jingting v. Hengshui Ziyahe*. Together with *Huawei v. InterDigital*, the SPC's decision in *Zhang Jingting v. Hengshui Ziyahe* confirms the application of the FRAND rule in SEP disputes within Chinese courts. To some extent, the SPC's decision in this case also limited the application of the judicial reply in *Ji Qiang, Liu Hui v. Chaoyang Xingnuo* of 2008. Some Chinese scholars believe that this case transformed SEP protection in China from "absolute restriction" to "reasonable restriction," because the determination of SEP royalties changed from significantly low returns under *Ji Qiang, Liu Hui v. Chaoyang Xingnuo* to higher ones under FRAND as seen in *Zhang Jingting v. Hengshui Ziyahe*.[1269]

Biaozhun Biyao Zhuanli Xuke Shiyongfei de Jisuan- Yi Zhongmei Xiangguan Anjian Bijiao wei Shijiao (FRAND 标准必要专利许可使用费的计算- 以中美相关案件比较为视角) [*The Calculation of FRAND SEPs Licensing Royalty: A Comparison of Related Cases in China and U.S.A*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 866, 873.

[1265] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013), Li Yang & Liu Ying (李扬& 刘影), *FRAND Biaozhun Biyao Zhuanli Xuke Shiyongfei de Jisuan- Yi Zhongmei Xiangguan Anjian Bijiao wei Shijiao* (FRAND 标准必要专利许可使用费的计算- 以中美相关案件比较为视角) [*The Calculation of FRAND SEPs Licensing Royalty: A Comparison of Related Cases in China and U.S.A*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 866, 872.

[1266] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013), Hu Hong (胡洪), *Sifa Shiye xia de FRAND Yuanze- JianPing Huawei Su IDC An* (司法视野下的 FRAND 原则- 兼评华为诉 IDC 案) [*Analysis of the Principle of FRAND from Judicial Perspective Review of Huawei v. IDC Case*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 884, 894.

[1267] *See* Li Yang & Liu Ying (李扬&刘影), *FRAND Biaozhun Biyao Zhuanli Xuke Shiyongfei de Jisuan- Yi Zhongmei Xiangguan Anjian Bijiao wei Shijiao* (FRAND 标准必要专利许可使用费的计算- 以中美相关案件比较为视角) [*The Calculation of FRAND SEPs Licensing Royalty: A Comparison of Related Cases in China and U.S.A*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 866, 874.

[1268] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013), Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).

[1269] *See* Hu Hong (胡洪), *Sifa Shiye xia de FRAND Yuanze- JianPing Huawei Su IDC An* (司法视野下的 FRAND 原则- 兼评华为诉 IDC 案) [*Analysis of the Principle of FRAND from Judicial Perspective Review of Huawei v. IDC Case*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 884, 886-889.

In *Zhang Jingting v. Hengshui Ziyahe,* the patented technology was a construction method, called "joint construction method of prefabricated composite bearing wall structures."[1270] The patentee Zhang Jingting got the patent in September 2008.[1271] The patented technology was incorporated into a construction standard adopted by the Department of Construction of Hebei Province.[1272] Without obtaining a license or paying a royalty, Hengshui Ziyahe Corporation used this patented technology.[1273] Thus, Zhang Jingting brought a patent infringement lawsuit in Hebei Shijiazhuang Intermediate People's Court.[1274]

The court held that Hengshui Ziyahe Corporation infringed the patent. Consequently, the court ordered the corporation to compensate the patentee Zhang Jingting in the amount of 800,000 RMB.[1275] The court also granted the injunction requested by Zhang Jingting, preventing the Hengshui Ziyahe Corporation from using the patented technology.[1276] The corporation appealed to the Hebei High People's Court.

The Hebei High People's Court reversed the decision of the lower court. Citing the judicial reply in *Ji Qiang, Liu Hui v. Chaoyang Xingnuo*, the court decided that Hengshui Ziyahe's exploitation of the technology did not constitute patent infringement.[1277] The reason was that the patented technology was incorporated into a local standard of the Hebei Province, and the patentee Zhang Jingting participated in the standard-setting.[1278] Thus, the patentee should be deemed to have permitted the exploitation of the patent by others in return for a royalty significantly lower than the normal amount.[1279] The high court reduced the compensation amount from 800,000 RMB to 100,000 RMB. The high court reasoned that the patentee had "impliedly licensed" its patent, overturning the injunction as well.[1280] Zhang Jingting appealed to the SPC.

[1270] Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (最高人民法院(2012)民提字第 125 号) [No. 125 (2012) of the Supreme People's Court] (Sup. People's Ct. Jan. 2, 2014).
[1271] *Id.*
[1272] *Id.*
[1273] *Id.*
[1274] *Id.*
[1275] Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (河北省石家庄市中级人民法院(2009)石民五初字第 00163 号) [No. 163 (2009) of the Hebei Shijiazhuang Intermediate People's Court] (Hebei Shijiazhuang Interm. People's Ct. Dec. 10, 2010), D. Daniel Sokol & Wentong Zheng, *FRAND in China*, 22 TEX. INTELL. PROP. L. J. 71, 86 (2013).
[1276] Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (河北省石家庄市中级人民法院(2009)石民五初字第 00163 号) [No. 163 (2009) of the Hebei Shijiazhuang Intermediate People's Court] (Hebei Shijiazhuang Interm. People's Ct. Dec. 10, 2010).
[1277] Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (河北省高级人民法院(2011)冀民三终字第 15 号) [No. 15 (2011) of the Hebei High People's Court] (Hebei High People's Ct. Mar. 21, 2011).
[1278] *Id.*
[1279] *Id.*, D. Daniel Sokol & Wentong Zheng, *FRAND in China*, 22 TEX. INTELL. PROP. L. J. 71, 86 (2013).
[1280] Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (河北省高级人民法院(2011)冀民三终字第 15 号) [No. 15 (2011) of the Hebei High People's Court] (Hebei High People's Ct. Mar. 21, 2011), Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of*

The SPC ultimately reversed the decision of the high court. The SPC indicated that the judicial reply in *Ji Qiang, Liu Hui v. Chaoyang Xingnuo* was only intended as a response for that specific case.[1281] Therefore, the lower court could not cite the judicial reply as the principle reason for its decision.[1282] In addition, the local construction standard at issue was just a voluntary standard, not a mandatory standard.[1283] The Hengshui Ziyahe Corporation could have chosen not to adopt this standard.[1284] Thus, to implement the voluntary standard, the corporation should have obtained the patentee's consent, and paid the license fee under the "fair, reasonable, and, non-discriminatory ('FRAND')" principle.[1285] When the standard implementer does not obtain the patentee's consent and rejects paying the royalty, there should not be any restriction on remedies against patent infringement.[1286] Finally, under the FRAND principle, the SPC increased the compensation amount from 100,000 RMB to 400,000 RMB.[1287] The SPC also held that the intermediate court was correct in granting the injunction because Hengshui Ziyahe refused to pay the royalty at the time.[1288]

The SPC did not indicate its rationale in employing the FRAND principle for this case. Despite the fact that the decision was not nearly as clear as the decision issued in *Huawei v. InterDigital,* the case still marks a new milestone for SEP disputes in China because the SPC confirmed the application of the FRAND rule.[1289] In the future, it is likely that Chinese courts will apply the FRAND rule in deciding license fees for voluntary standard SEPs. Both *Zhang Jingting v. Hengshui Ziyahe* and *Huawei v. InterDigital* confirmed the application of the FRAND rule, so it is likely that Chinese courts will continue issuing decisions in this manner. This case also demonstrates that the judicial reply in *Ji Qiang, Liu Hui v. Chaoyang Xingnuo* can only be applied to determine license fees for mandatory standard SEPs.

5. SPC 2015 Judicial Interpretation (drafted) (2015)

When SEP disputes emerged in some Chinese courts, the SPC started to issue judicial interpretations to instruct Chinese courts in the future. Judicial interpretations issued by the SPC are explnatroy memoranda with respect to particular laws or procedural issues, especially at the behest of the lower courts.[1290] The SPC has issued thousands of judicial interpretatations that guide the lower courts on a broad range of substantive and procedural issues.[1291] The SPC's authority to

---

Remedy when Patents Incorporated into Standards], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 77.

[1281] Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (最高人民法院(2012)民提字第 125 号) [No. 125 (2012) of the Supreme People's Court] (Sup. People's Ct. Jan. 2, 2014).

[1282] *Id.*

[1283] *Id. See* Chapter 4 for further discussion on the distinction between mandatory and voluntary standards.

[1284] Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (最高人民法院(2012)民提字第 125 号) [No. 125 (2012) of the Supreme People's Court] (Sup. People's Ct. Jan. 2, 2014).

[1285] *Id.*

[1286] *Id.*

[1287] *Id.*

[1288] *Id.*

[1289] *See also* Hu Hong (胡洪), *Sifa Shiye xia de FRAND Yuanze- JianPing Huawei Su IDC An* (司法视野下的 FRAND 原则- 兼评华为诉 IDC 案) [*Analysis of the Principle of FRAND from Judicial Perspective Review of Huawei v. IDC Case*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 884, 889.

[1290] JAMES M. ZIMMERMAN, CHINA LAW DESKBOOK: A LEGAL GUIDE FOR FOREIGN-INVESTED ENTERPRISES 76 (4th ed. 2014).

[1291] *Id.*

interpret is vested within legislative bodies such as ministries under the State Council.[1292] Chinese judges are required to apply the SPC's judicial interpretation, so judicial interpretations function as statutes in national jurisdiction.[1293] To address the SEP issue, the SPC included Article 25 in its drafted judicial interpretation, called Interpretation of the Supreme People's Court on Several Issues concerning the Application of Law in the Trial of Patent Infringement Dispute Cases (Part Two) (hereinafter "drafted SPC 2015 Judicial Interpretation").[1294] This SPC's drafted judicial interpretation was issued in February 2015, and is now seeking public comment.[1295] Although the draft is only a proposal, the document provides evidence of an emerging consensus among the Justices of the SPC.[1296]

As opposed to the four judicial decisions mentioned above, Article 25 in the drafted judicial interpretation places greater emphasis on the duty of disclosure for SEP holders.[1297] Article 25 also focuses on injunctive relief, but is silent as to royalties.[1298] More importantly, Article 25 merely applies to SEP disputes in voluntary standards, and does not include mandatory standards.[1299] The SPC does not offer guidance on SEP disputes in mandatory standards partly because mandatory standards function as administrative regulations in the national jurisidiction (*see supra* in § II. A. 1).[1300] Because of this, a judicial interpretation on mandatory standards by the SPC may pose potential jurisdictional issues and conflicts.

Article 25 attempts to indicate the following different scenarios under which Chinese courts should or should not grant injunctive relief:

- **Scenario 1: SEP not disclosed**
  Section One of Article 25 provides that when SEPs involved in voluntary standards are disclosed, standard implementers should obtain the patentees' license to use the SEPs.[1301] If the patentee fails to disclose the involved SEPs in voluntary standards, the standard implementers may use the SEPs without the patentee's license.[1302] Patentees are deemed

---

[1292] *Id.*
[1293] Interview with CNUNI-3, 2015.
[1294] Zuigao Renmin Fayuan Guanyu Shenli Qinfan Zhuanliquan Jiufen Anjian Yingyong Falü Ruogan Wenti de Jieshi Er Zhengqiu Yijian Gao (最高人民法院关于审理侵犯专利权纠纷案件应用法律若干问题的解释(二)(征求意见稿)) [Interpretation of the Supreme People's Court on Several Issues concerning the Application of Law in the Trial of Patent Infringement Dispute Cases (Part Two)(Draft for Asking Comments)], http://www.hfiplaw.cn/?p=2809 (China).
[1295] *Id.*
[1296] Interview with CNUNI-3, 2015.
[1297] Zuigao Renmin Fayuan Guanyu Shenli Qinfan Zhuanliquan Jiufen Anjian Yingyong Falü Ruogan Wenti de Jieshi Er Zhengqiu Yijian Gao (最高人民法院关于审理侵犯专利权纠纷案件应用法律若干问题的解释(二)(征求意见稿)) [Interpretation of the Supreme People's Court on Several Issues concerning the Application of Law in the Trial of Patent Infringement Dispute Cases (Part Two)(Draft for Asking Comments)], http://www.hfiplaw.cn/?p=2809 (China).
[1298] *See* Art. 25 of the drafted SPC 2015 Judicial Interpretation.
[1299] *See id.*
[1300] *See also* Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 75, BEIJINGSHI ZHISHICHANQUAN JU (北京市知识产权局) [BEIJING INTELLECTUAL PROPERTY OFFICE], ZHUANLI JIUFEN ANJIAN PINGXI (专利纠纷案件评析)[ANALYZING PATENT DISPUTE CASES] 51 (2005).
[1301] *See* Art. 25 of the drafted SPC 2015 Judicial Interpretation.
[1302] *See id.*

to have impliedly licensed their SEPs and the courts are therefore prohibited from granting injunctive relief.

- **Scenario 2: SEP disclosed**
  - ***Scenario 2-1: feasible to negotiate license***
    As mentioned above, when SEPs involved in voluntary standards are disclosed, it is necessary to negotiate license agreements with patentees.[1303] Section Two of Article 25 provides that without the license agreements, courts are permitted to grant patentees injunctive relief, which could prohibit standard implementers from using the patented technology.[1304] Section Three of Article 25 then provides that patentees and standard implementers should negotiate license agreements in advance.[1305] If the two parties cannot reach an agreement, they can ask the court to make a decision.[1306] The courts should decide the license agreement based on FRAND principles, considering the innovation of patents, function of patents in standards, technological areas of standards, nature of standards, scope of implementing standards.[1307]
  - ***Scenario 2-2: failure to negotiate a license***
    However, courts will not grant injunctive relief if the patentee intentionally violates its FRAND commitments and standard implementers without clear fault lead patentees and implementers to fail to reach a license agreement.[1308] Under such circumstances, even though there are no preexisting license agreements, standard implementers can still use the patented technology.

Although Article 25 carries great illustrative value, the Article is merely a draft and still asking for public comment. Once Article 25 of the drafted judicial interpretation is finalized and issued, it will guide China's judges as well as the legal profession and technological industries.

B. Administrative Regulations

1. SAC and SIPO Measures on National Standards Involving Patents (2014)

In December 2013, the SAC and SIPO issued the *Regulatory Measures on National Standards Involving Patents (Interim)* ("Measures").[1309] The Measures became effective in January 2014.[1310] The Measures are composed of fundamental principles, so the SAC and General Administration of Quality Supervision, Inspection and Quarantine ("AQSIQ") also issued detailed procedural rules, called *Special Procedures for the Development of Standards—Part 1: Standard Related to Patents* ("Rules").[1311] The Measures and Rules mentioned above merely apply to formulating, revising, or

---

[1303] *See id.*
[1304] *See id.*
[1305] *See id.*
[1306] *See id.*
[1307] *See id.*
[1308] *See id.*
[1309] WANG YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 25, 105 (2014) .
[1310] Art. 24 of the SAC and SIPO Measures on National Standards Involving Patents, WANG YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 25 (2014).
[1311] Art. 20 of the SAC and SIPO Measures on National Standards Involving Patents, BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 25 (2014),

implementing "national mandatory and voluntary standards" involving patents.[1312] However, these Measures and rules may still be referred to in cases of industrial standards and local standards.[1313] They offer helpful insight into the Chinese government's general position on national standards involving patents, i.e. SEPs.

In the Measures, the main issues discussed were concerning SEP holders' disclosure duty and license commitment.[1314] Regarding the duty of disclosure, the Measures distinguished the duty between standard-setters and non-standard-setters.[1315]

- Standard-setters are required to timely disclose their SEPs, including granted patents and patent applications, at any stage of formulating or revising national standards.[1316] They must provide the relevant patent information and its verification materials, as well as take the responsibilities for the materials' authenticity.[1317] Otherwise, if a standard-setter violates the honesty and credit principle, the standard-setter bears legal liability.[1318]

Yang Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上)) [*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62, 62, Wang Xianlin (王先林), *Sheji Zhuanli de Biaozhun Zhiding he Shishi zhong de Fanlongduan Wenti* (涉及专利的标准制定和实施中的反垄断问题) [*Anti-monopoly Issues in the Setting and Enforcement of Standard Related to Patent*], FAXUEJIA (法学家) [JURIST], no.4, 2015, at 62, 64. *See* Chapter 4 for further discussion regarding the relationship between the SAC and AQSIQ institutions.

[1312] Yang Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上)) [*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62, 62, Wang Xianlin (王先林), *Sheji Zhuanli de Biaozhun Zhiding he Shishi zhong de Fanlongduan Wenti* (涉及专利的标准制定和实施中的反垄断问题) [*Anti-monopoly Issues in the Setting and Enforcement of Standard Related to Patent*], FAXUEJIA (法学家) [JURIST], no.4, 2015, at 62, 64.

[1313] Yang Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上)) [*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62, 62, Wang Xianlin (王先林), *Sheji Zhuanli de Biaozhun Zhiding he Shishi zhong de Fanlongduan Wenti* (涉及专利的标准制定和实施中的反垄断问题) [*Anti-monopoly Issues in the Setting and Enforcement of Standard Related to Patent*], FAXUEJIA (法学家) [JURIST], no.4, 2015, at 62, 64. *See* Chapter 4 for further discussion regarding national standards, industrial standards, and local standards.

[1314] *See* Chapter 2 and 3 of the SAC and SIPO Measures on National Standards Involving Patents. The issues of disclosure duty and license commitment used to cause great concern in the United States within antitrust law. *See* Chapter 5 of the dissertation. In Chapter 6, these same issues are discussed under the patent remedy section. The first reason for the differences between Chapter 5 and 6 is how SEP disputes emerged in a different sequence of events for these two countries. In China, SEP disputes started as an issue in patent remedies; whereas, in the United States, SEP disputes began with antitrust enforcement actions. Accordingly, when the Chinese government started drafting the Measures in 2000, China's SEP legal landscape had only addressed remedies under PRC *Patent Law*. Additionally, the Chinese *Antimonopoly Law* was issued in 2007 and went into force in 2008. China did not have an existing antitrust system and enforcement when the Measures were in draft and discussion in 2000. Because of this, the Measures will be discussed under the section of patent remedy section, not antitrust intervention, in Chapter 6.

[1315] Standard-setters including individuals and organizations formulate or revise the standards. *See* Art. 5 of the SAC and SIPO Measures on National Standards Involving Patents.

[1316] *Id.*

[1317] *Id.*

[1318] *Id.*

- In contrast, non-standard-setters are merely encouraged under no compulsory effect to complete the disclosure and notification duties mentioned above and encouraged to take the relevant authenticity responsibilities.[1319]

As for the license commitment, the Measures also differentiated between national voluntary and mandatory standards.

- When formulating or revising national voluntary standards that involve patents, the government must acquire FRAND or royalty-free ("RF") license commitments from patentees.[1320] Without the SEP holder's FRAND or RF commitment, the government will not incorporate the patented technology into the national voluntary standards.[1321] Moreover, the government will stop enforcing national voluntary standards that incorporate SEPs without FRAND or RF commitments, and can then revise the at-issue standards.[1322]
- In contrast, national mandatory standards generally do not involve patents.[1323] Nonetheless, when it is impossible to avoid involving patents in national mandatory standards and acquiring FRAND or RF commitment is unavailable, the government will negotiate with patentees about disposal resolutions instead of evading the use of the patented technology.[1324]

The finalized Measures were a result of bargaining between the Chinese government and the private sector. The SAC started to work on the Measures in 2000, asking for public comment a total of three times in 2004, 2009, and 2012.[1325] The original drafts of the Measures imposed great restrictions on SEP holders, and so favored standard implementers.

- One such example can be seen in the FRAND license commitment in the 2009 draft of the Measures. The 2009 draft provided that once SEP holders made a FRAND commitment, their license royalties will be "significantly lower" than the normal royalty amount.[1326] The content of the 2009 draft bore similarities to the judicial reply issued by the SPC in 2008 in the case of *Ji Qiang, Liu Hui v. Chaoyang Xingnuo*.
- The 2009 draft also provided that if standard-setters intentionally fail to disclose their SEPs, they are considered to have licensed the SEPs under RF (royalty-free) commitment.[1327]

[1319] Art. 6 of the SAC and SIPO Measures on National Standards Involving Patents.
[1320] *See* Art. 10, 11, 12 of the SAC and SIPO Measures on National Standards Involving Patents.
[1321] WANG YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 38 (2014).
[1322] *See* Art. 12 of the SAC and SIPO Measures on National Standards Involving Patents.
[1323] Art. 14 of the SAC and SIPO Measures on National Standards Involving Patents.
[1324] *See* Art. 15 of the SAC and SIPO Measures on National Standards Involving Patents.
[1325] WANG YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 27 (2014).
[1326] *See id.* at 141-142, Yang Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上)) [*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62, 63.
[1327] *See* WANG YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 141-142 (2014), Yang Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上))

These examples give us insight into the mindset of the Chinese government on SEP issues. The government tended to offer weak SEP protection and consider standards as public property.[1328] It took the SAC and SIPO 13 years to draft and finalize the Measures (2000-2013).[1329] In the meantime, when asked for public comment, Chinese domestic and foreign legal communities used to seriously debate about provisions that restricted patentees' rights greatly, such as the duty of disclosure, low or free license fees, and complory license of patents in mandatory standards.[1330] The SAC and SIPO ultimately removed the controversial provisions, and to some extent, kept these issues ambiguous in the finalized Measures.[1331] Therefore, SEP holders will need to rely on future cases or instructions to clarify the Measures.

C. Legislation

1. Patent Law 4th Reform (drafted) (2015)

The Chinese government is now preparing to revise its *Patent Law*.[1332] Article 85 in the proposed fourth reform addresses SEPs.[1333] Article 85 as proposed recognizes the duty of SEP disclosure in setting national standards.[1334] This duty to disclose for SEP holders is not a new issue, as the issue has been discussed and even debated in the SAC and SIPO Measures on National Standards Involving Patents.[1335] But, enacting Article 85 of the proposed new *Patent Law* may help clarify and further define the Measures as discussed in the above section.

In the draft proposed by the SIPO, Article 85 provides that when standard-setters fail to disclose their SEPs in the process of formulating national standards, they are deemed to permit standard implementers to use their patented technology.[1336] The patentees and standard implementers are encouraged to negotiate the royalties for the patented technology.[1337] If the

---

[*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62, 63.

[1328] *See also* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 45 (2010), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] 26 (2010).

[1329] *See* Yang Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上)) [*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62, 63.

[1330] *See id.*

[1331] *See id.*

[1332] Zhonghua Renmin Gongheguo Zhuanli Fa Xiuding Caoan Songshen Gao (中华人民共和国专利法修订草案(送审稿)) [Drafted Amendment of Patent Law of People's Republic of China (Draft for Approval)], http://www.chinalaw.gov.cn/article/cazjgg/201512/20151200479591.shtml (China).

[1333] Art. 85 of the drafted Patent Law amendment.

[1334] *Id.*

[1335] *See* Art. 5 of the SAC and SIPO Measures on National Standards Involving Patents, WANG YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] 142 (2014), Yang Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上)) [*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62, 63.

[1336] Art. 85 of the drafted Patent Law amendment.

[1337] *Id.*

negotiation fails, the two parties can request that SIPO make the final decision on the matter.[1338] The draft still calls for public comment, so how Article 85 will be ultimately implemented remains to be seen. Despite the lack of finality, the draft allows insight into the Chinese government's attitude towards SEPs.

D. Patent Remedies Summary

In China, the courts have issued four decisions addressing SEP patent remedies issues. Despite the limited number of cases, a noticeable pattern has developed.

- First, China has progressed considerably in the area of SEP protection. From the unavailability of judicial relief in *THERI v. CIGIS* to extremely restrictive protection in *Ji Qiang, Liu Hui v. Chaoyang Xingnuo*, China now assumes a doctrine of reasonably restricted protection for SEPs in *Huawei v. InterDigital* and *Zhang Jingting v. Hengshui Ziyahe*.
- Second, the FRAND rules were confirmed by the SPC in *Zhang Jingting v. Hengshui Ziyahe* in 2014, and serve as guidance for future SEP disputes.
- Third, injunctions are rarely granted in SEP disputes.
- Last, Chinese courts generally follow two tracks to handle SEP disputes: the voluntary standard track or the compulsory standard track. With regard to voluntary standards, standard implementers must pay the license fees under FRAND rules. To determine the FRAND royalties, the court will consider industry profitability, comparable former licenses, and the patent's characteristics, such as: quantity, quality, industrial position, territory. Chinese courts will not grant injunctions unless implementers have acted in bad-faith. Regarding mandatory standards, standard implementers pay license fees significantly less than the normal licensing fees. SEP holders are not entitled to an injunction because they are deemed to have granted an implied license to their patents.

Following the four judicial decisions, the SPC drafted Article 25 in the 2015 Judicial Interpretation to address the SEP problem. The Article is now being circulated for public comment and as such is not yet effective. However, the proposed measures by the SPC may suggest some level of consensus among the Justices in the SPC. Although Article 25 has yet to be finalized, it still offers value as a reference. As seen in Table 6-3, the SPC indicated several possible scenarios in which Chinese courts should consider granting an injunction and determining royalties. The SPC developed these scenarios based not only on the two-track model mentioned above, but also in consideration of SEP disclosure.

- When SEPs are in mandatory standards or when SEPs are not disclosed in voluntary standards, the courts will not grant an injunction to cease infringement by standard implementers. In addition, the courts will determine royalties at significantly less than normal rates.
- However, when SEPs are disclosed in voluntary standards, the courts will decide royalties under the FRAND principles. In general, the courts will grant injunctions when SEPs are disclosed in voluntary standards. But if SEP holders violate their FRAND commitment and standard implementers act in good faith, the courts will not grant an injunction to cease the implementers' infringement.

[1338] *Id.*

Table 6-3: Chinese Possible Tracks and General Positions in SEP Remedy

Standard Nature	SEP Disclosure	Patentee	Standard Implementer	Courts' General Position	
				Injunction	Royalties
SEPs in Voluntary Standards	SEPs Disclosed	Obey FRAND Commitment		Grant	FRAND
		Violate FRAND Commitment	Bad Faith	Grant	FRAND
			Good Faith	No Grant	FRAND
	SEPs Not Disclosed			No Grant	Significantly less
SEPs in Mandatory Standards				No Grant	Significantly less

Source: Compiled by the author

Developed based on the judicial decisions as they evolved and proposed judicial interpretation, the scenarios are essentially consistent with the SAC and SIPO Measures on National Standards Involving Patents, as well as Article 85 in the drafted *Patent Law* reform. However, just as with China's patent remedies system, China's SEP protection has room for improvement. It is ambiguous whether an SEP royalty is "significantly less than" the normal. It is also unclear how courts will apply the "FRAND" rule in deciding reasonable royalties for SEP holders. It remains unclear what conditions rise to the level of "bad-faith" before a court will grant an injunction. Even though the government issued the SAC and SIPO Measures on National Standards Involving Patents, the Measures need greater clarity to practically resolve problems that arise in SEP remedy. Unfortunately, the proposed *Patent Law* reform or the proposed SPC 2015 Judicial Interpretation may only result in the same dilemma, as public input had only further complicated the rules in SEP remedy. In the future, more specific cases or other general rules should be developed pertaining to the factors used to decide FRAND royalties and grant injunctions. The Chinese government needs greater discussion of its rationale in SEP decisions to better establish principles to guide SEP problem-solving. The government should also establish clearer guidelines through SEP legislation. Hopefully the combination of both judicial and legislative reform will shed greater clarity on SEP remedy and protection in China.

III. **Antitrust Intervention**

This section analyzes the intersection of the PRC *Antimonopoly La*w and the *Patent Law* with regard to SEP protection issues. China enacted its *Antimonopoly Law* in 2007, which came into force in 2008.[1339] Seeing as the antimonopoly is a rather new addition to the legal landscape, it is difficult to assess how the law will affect industry in the long run. Nevertheless, the Chinese economy has been growing so quickly that most SEP disputes have taken place post-2008, occurring nearly simultaneously as the newly in force *Antimonopoly Law*. These SEP disputes are considered new and complicated issues in traditional PRC *Antimonopoly Law*.[1340] Because China has limited experience in antitrust enforcement, administrative agencies and courts in China are struggling to decide how to enforce the new *Antimonopoly Law* in SEP disputes.

[1339] Fanlongduan Fa (反垄断法) [Antimonopoly Law] (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 30, 2007, effective Aug. 1, 2008) 2007 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 517 (China).
[1340] *See* Zhu Jianjun & Chen Wenquan (祝建军&陈文全), *Biaozhun Biyao Zhuanli Shiyong Feilü Jiofen Juyou Kesuxing* (标准必要专利使用费率纠纷具有可诉性) [*Standard-essential-patent License Dispute Has Suability*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 4, 6.

Under the current *Antimonopoly Law*, Article 55 is the only provision that mentions IP issues and restricts IP' exclusivity rights.[1341] Article 55 provides that the *Antimonopoly Law* does not govern business operators' conduct when the operators legitimately exploit their IP; however, Article 55 should govern when the operators abuse their IP to eliminate or restrict market competition.[1342] As it exists, this provision is rather ambiguous.[1343] It is unclear how the Chinese government will decide whether IP owners have abused their exclusive rights to restrict or eliminate competition.[1344] To address the IP abuse issue or SEP dispute, the Chinese government, including the State Council and its subordinate antimonopoly agencies, is now drafting relevant guidelines, called *Antimonopoly Guidelines for the Abuse of Intellectual Property* (hereinafter "Antimonopoly Guidelines for IP Abuse").[1345] Given China's brief history in antitrust and patent protection, it will take time before the government can develop and enforce the Antimonopoly Guidelines for IP Abuse.[1346]

Prior to the issuance of the Antimonopoly Guidelines for IP Abuse, SEP judicial and administrative decisions had already been issued, as seen in

Table 6-4. The following discussion reviews SEP antitrust regulations as they have evolved in China.

- The discussion begins with the compulsory license provision in the third reform of the *Patent Law* in 2009. In conjunction with compulsory licenses, antitrust intervention imposed great restrictions on a patentee's exclusive rights. Despite these two regulatory approaches, the government initially struggled to address complex SEP issues.
- In October 2013, the court issued its first antitrust decision concerning SEPs in *Huawei v. InterDigital*.[1347] Soon after, the NDRC issued its first administrative decision *In re*

[1341] *See* WANG JIANG (万江), ZHONGGUO FANLONGDUAN FA (中国反垄断法) [CHINA COMPETITION LAW] 179 (2015).
[1342] Art. 55 of the Antimonopoly Law.
[1343] *See* Thomas R. Howell, Alan Wm. Wolff, Rachel Howe & Diane Oh, *China's New Antimonopoly Law*, 18(1) PAC. RIM L. & POL'Y J. 53, 75 (2009).
[1344] *See id.*
[1345] *See* Zhong Chun (仲春), *Biaozhun Biyao Zhuanli Jinling Lanyong de Guizhi- Anquangang Yuanze ji Qita* (标准必要专利禁令滥用的规制-安全港原则及其他) [*Regulation of Standard-essential-patent Injunction Abusing-Safe Harbor Rule et al*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.9, 2014, at 22, 27, Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3, Yi Jiming (易继明), *Jinzhi Quanli Lanyong Yuanze zai Zhishichanquan Lingyu zhong de Shiyong* (禁止权利滥用原则在知识产权领域中的适用) [*The Application of the Principle of the Prohibition of Abuse of Rights in the Field of Intellectual Property*], ZHONGGUO FAXUE (中国法学) [CHINA LEGAL SCI.], no.4, 2013, at 39, 39.
[1346] Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3, Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 43.
[1347] Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 69.

Qualcomm on a similar SEP issue. The NDRC applied most of the same rationale as in *Huawei v. InterDigital* when the NDRC analyzed antimonopoly issues in SEP.

- After these two key decisions, the SAIC issued the first IP-antitrust administrative regulation, the SAIC Provisions on Prohibiting IP Abuse. As of this writing, the Chinese antitrust agencies have begun to draft the Antimonopoly Guidelines for IP Abuse. The government shifted its governance from specific decisions to general principles in order to better address antimonopoly issues in SEPs.

Table 6-4: Evolving SEP Antitrust Regulations in China

Year.Mo	Name	Administrative			Legislative	Judicial	
		Decision	Regulation	Guideline		Interpretation	Decision
2009.10	Patent Law 3rd Reform (in Chapter 6)				X		
2013.10	*Huawei v. InterDigital*						X
2015.2	*In re Qualcomm*	X					
2015.8	SAIC Provisions on Prohibiting IP Abuse		X				
2015.10	Antimonopoly Guidelines for IP Abuse (drafted)			X			

Source: Compiled by the author

A. Legislation

1. Patent Law 3rd Reform (2009)

Soon after enforcing its *Antimonopoly Law*, China reformed its *Patent Law* for the third time, issuing new changes in December 2008 and later coming into force in October 2009.[1348] The third reform generally increased the possibility of compulsory licenses, which may concern foreign investors.[1349] Although the law was enacted in 2008, the Chinese government has not yet made any decisions on compulsory licenses up until now.[1350]

Compulsory licenses involve both issues of patent remedy and antitrust. As such it may be discussed under either the "remedy" or "antitrust" subsection of this chapter.[1351] Compulsory licenses will be considered as an antitrust issue, because Article 48 of the third reform considers the anticompetitive impact as one primary reasons for granting compulsory licenses.[1352] Under

[1348] Zhuanli Fa (专利法) [Patent Law] (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008, effective Oct. 1, 2009) 2009 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 27 (China).

[1349] *See* MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 841 (3d ed. 2009), YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 494 (2011).

[1350] YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 494 (2011), LIU KONGZHONG (LIU KUNG-CHUNG 劉孔中), JIEGO ZHICAI FA JI QI YU JINGZHENG FA DE CHONGTU YU TIAOHE (解構智財法及其與競爭法的衝突與調和) [DECIPHERING IP LAW AND ITS CONFLICT/RECONCILIATION WITH COMPETITION LAW] 174 (2015).

[1351] *See* MARTIN J. ADELMAN, RANDALL R. RADER & JOHN R. THOMAS, CASES AND MATERIALS ON PATENT LAW 841-842 (3d ed. 2009), LIU KONGZHONG (LIU KUNG-CHUNG 劉孔中), JIEGO ZHICAI FA JI QI YU JINGZHENG FA DE CHONGTU YU TIAOHE (解構智財法及其與競爭法的衝突與調和) [DECIPHERING IP LAW AND ITS CONFLICT/RECONCILIATION WITH COMPETITION LAW] 173-174 (2015).

[1352] *See* Art. 48 of the Patent Law.

Article 48 of the third reform, if an SEP holder abuses its exclusive right, the Chinese government may grant a compulsory license in the future.[1353]

Article 48 of the third reform can highlight the connection between the *Antimonopoly Law* issued in 2008 and the compulsory license provisions in *Patent Law* reformed in 2009. Under Article 48, there are two scenarios in which SIPO may grant a compulsory license upon applications of eligible entities or individuals.[1354]

- The first scenario is when patentees fail to (fully) exploit their patents without any justification. This provision evolved from earlier version of the *Patent Law* in 1984, 1992, and 2000.[1355]
- The second scenario in which SIPO may grant a compulsory license was newly added in 2009. The second scenario is triggered when a patentee's exploitation of its patent right is determined to be a monopoly act, and the act's subsequent anticompetitive impact needs to be eliminated or reduced.[1356] Whether a patentee's exploitative act is considered a monopoly depends on the *Antimonopoly Law.*[1357] The decision can be made either by Chinese courts or administrative antimonopoly agencies, i.e. the NDRC, SAIC, and Ministry of Commerce ("MOFCOM").[1358] Once any of these government institutions issues an antimonopoly decision, SIPO then can grant compulsory licenses based on that decision.[1359] Therefore, antimonopoly regulations and compulsory licenses are closely tied together in Chinese Law.

In China, compulsory licenses may also be used to counterbalance anticompetitive effects that occur when SEP holders abuse their exclusive rights.[1360] Unfortunately, the Chinese government will face great difficulty and challenges in enforcing this compulsory license mechanism. The main reason for this is that Article 55 of the *Antimonopoly Law* and Article 48 of the *Patent Law* leave unresolved the problems found at the intersection of IP-antitrust. This will engender problems in enforcement. This complicated but significant IP-antitrust issue remains highly controversial in China.[1361] Most of the relevant cases or rules are still developing and under draft.[1362] These cases or rules will be discussed in the following section.

[1353] LIU KONGZHONG (LIU KUNG-CHUNG 劉孔中), JIEGO ZHICAI FA JI QI YU JINGZHENG FA DE CHONGTU YU TIAOHE (解構智財法及其與競爭法的衝突與調和) [DECIPHERING IP LAW AND ITS CONFLICT/RECONCILIATION WITH COMPETITION LAW] 174 (2015).

[1354] Art. 48 of the Patent Law, YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 504, 508 (2011).

[1355] *See* Art. 48 of the Patent Law, ZHISHICHANQUAN CHUBANSHE (知识产权出版社) [INTELLECTUAL PROPERTY PUBLISHING HOUSE], ZHUANLI FA JI ZHUANLI FA SHISHI XIZE (专利法及专利法实施细则) [PATENT LAW AND IMPLEMENTATION RULES OF PATENT LAW] 42-43(2013).

[1356] Art. 48 of the Patent Law.

[1357] YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 507-508 (2011).

[1358] *Id.*

[1359] *See* YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 508 (2011).

[1360] *See* LIU KONGZHONG (LIU KUNG-CHUNG 劉孔中), JIEGO ZHICAI FA JI QI YU JINGZHENG FA DE CHONGTU YU TIAOHE (解構智財法及其與競爭法的衝突與調和) [DECIPHERING IP LAW AND ITS CONFLICT/RECONCILIATION WITH COMPETITION LAW] 174 (2015).

[1361] *See* Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 34, Wang

B. Judicial Decisions

1. Huawei v. InterDigital (Guangdong High People's Ct. 2013)

The *Huawei v. InterDigital* case discussed *supra* in Section II. A. 3 was the first *Antimonopoly Law* case on SEP disputes.[1363] In terms of Huawei's antimonopoly allegations that InterDigital abused its market dominance in 3G standard SEPs, the Guangdong Shenzhen Intermediate People's Court ruled that InterDigital must immediately stop its over-charging and tied-in conduct.[1364] The court also required InterDigital to compensate Huawei's economic loss of 20 million RMB.[1365] On appeal, the Guangdong High People's Court affirmed the original judgment.[1366]

The courts held that each of InterDigital's SEPs in 3G standards were unique and irreplaceable in the SEP's license market i.e. relevant market.[1367] Therefore, InterDigital owned the entire market

---

Xianlin (王先林), *Sheji Zhuanli de Biaozhun Zhiding he Shishi zhong de Fanlongduan Wenti* (涉及专利的标准制定和实施中的反垄断问题) [*Anti-monopoly Issues in the Setting and Enforcement of Standard Related to Patent*], FAXUEJIA (法学家) [JURIST], no.4, 2015, at 62, 62.

[1362] *See* YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 507 (2011).

[1363] Zhang Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69, 69.

[1364] Ye Ruosi, Zhu Jianjun & Chen Wenquan (叶若思,祝建军,陈文全), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan de Rending- Ping Huawei Gongsi Su Meiguo IDC Gongsi Longduan Jiufen An* (标准必要专利权人滥用市场支配地位构成垄断的认定-评华为公司诉美国 IDC 公司垄断纠纷案) [*Determining Monopolization when Standard-essential-patent Holders Abuse their Market Dominance – Commenting the Huawei v. IDC Monopoly Dispute*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.3, 2013, at 46, 47-48, Zhu Jianjun (祝建军), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan* (标准必要专利权人滥用市场支配地位构成垄断) [*Monopolization when Standard-essential-patent Holders Abuse their Market Dominance*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 10, 11.

[1365] Zhu Jianjun (祝建军), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan* (标准必要专利权人滥用市场支配地位构成垄断) [*Monopolization when Standard-essential-patent Holders Abuse their Market Dominance*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 10, 11. Twenty million RMB is rougly the equivalent of $3.07 million USD under the exchange rate of 6.517 on March 8, 2016.

[1366] *Id.*

[1367] In light of Art. 12 of the *Antimonopoly Law,* the definition of relevant market depends on the commodities' or services' substitutability. The court indicated that when a patented technology is incorporated into a technology standard, product manufacturers have no choice but to ask for the patentee's license in order to comply with the standard. Because of this, the patented technology becomes the only necessary technology for product manufacturers, and the patentee will be the only supplier to afford this technology, creating a monopoly. Under these circumstances, the court held that each SEP in each telecommunication standard is unique and irreplaceable in the SEP's license market. (Each telecommunication standard refers to a different generation standard (i.e. 2G, 3G, or 4G standards) and the different standards in one specific generation (e.g. WCDMA, CDMA2000, TD-SCDMA in 3G standards).) Each SEP cannot be replaced by other (patented) technologies in its license market. The court even stated that InterDigital could not prove that Huawei would be able to obtain substitute (patented) technology. Also, because of each patent's territoriality, the court ruled that InterDigital's SEP license market in China and the United States were two separate territorial markets. Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013). *See also* Gu Ping & Zhang Hongbin (顾萍&张宏斌), *Biaozhun Biyao Zhuanli xia de XiangGuan Shangpin Shichang Jieding Fangfa ji*

share of each SEP's license market, and InterDigital could stop or impact other enterprises from getting access to the relevant market.[1368] InterDigital was thus considered to have market dominance in the relevant market.[1369] In addition, InterDigital not only requested that Huawei pay much higher license fees compared to its license fees for Apple and Samsung, but also forced Huawei to grant royalty-free licenses for all of Huawei's patents to InterDigital.[1370] This conduct was strong evidence of InterDigital's overpricing and discriminatory practice.[1371] In addition, InterDigital's litigation in the United States was aimed to compel Huawei to accept these unfair

---

Shichang Zhipei Diwei Rending de Kaoliang Yinsu (标准必要专利下的相关商品市场界定方法及市场支配地位认定的考量因素) [*Factors to Decide Relevant Market and Market Dominance of Standard-Essential-Patents*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.12, 2013, at 27, 30-31, Wang Xiaoye (王晓晔), *Shichang Zhipei Diwei de Rending- Dui Huawei Su IDC Yian de Kanfa* (市场支配地位的认定 -对华为诉 IDC 一案的看法) [*Determining Market Dominance- Opinion on Huawei v. IDC*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 17, 18.

[1368] Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).

[1369] Art. 17 (2) in the *Antimonopoly Law* provides that: "'dominant market position' refers to a market position held by a business operator having the capacity to control the price, quantity or other trading conditions of commodities in [the] relevant market, or to hinder or affect any other business operator to enter the relevant market." The court held that each of InterDigital's SEPs has uniqueness and irreplaceability, so InterDigital had 100 percent market share in the SEP license market. InterDigital therefore could impede or impact others' access to the market. Since InterDigital did not manufacture products, and its business model is to license the corporation's patents, InterDigital had unfair leverage in negotiations. Although Huawei could counter InterDigital through cross-licensing, when negotiating a 3G SEP license, InterDigital can easily prevail over Huawei because of its capability to control the SEP's price, quantity, and other transaction terms. Under these circumstances, the court held that InterDigital had market dominance in the relevant market. *Id. See also* Han Chuan & Yin Fenglin (韩伟&尹锋林), *Biaozhun Biyao Zhuanli Chiyouren de* Shichang Diwei Rending (标准必要专利持有人的市场地位认定) [*Determining Market Dominance of Standard-Essential-Patent Holders*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.3, 2014, at 33, 37, Wang Xiaoye (王晓晔), *Shichang Zhipei Diwei de Rending- Dui Huawei Su IDC Yian de Kanfa* (市场支配地位的认定 -对华为诉 IDC 一案的看法) [*Determining Market Dominance- Opinion on Huawei v. IDC*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 17, 18.

[1370] Zhu Jianjun (祝建军), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan* (标准必要专利权人滥用市场支配地位构成垄断) [*Monopolization when Standard-essential-patent Holders Abuse their Market Dominance*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 10, 11.

[1371] Art. 17(1) in the *Antimonopoly Law* provides that: "A business operator with a dominant market position shall not abuse its dominant market position to conduct [the] following acts: (1) selling commodities at unfairly high prices or buying commodities at unfairly low prices; … (6) applying dissimilar prices or other transaction terms to counterparties with equal standing." The court ruled that InterDigital abused its market dominance through over-pricing and discriminatory pricing. In its four negotiations with Huawei, InterDigital offered licenses at much higher rates than that what it offered to Apple and Samsung. This conduct was particularly abusive, as Apple and Samsung are top-ranking mobile phone manufactures, whereas Huawei is not. Yet InterDigital still charged Huawei a much higher license fee than it charged Apple and Samsung. In addition to charging excessive royalties, InterDigital forced Huawei to grant back Huawei's patents free of charge. Because InterDigital does not manufacture products and benefits from licensing its patents, this royalty-free grant-back license benefits InterDigital exceptionally. These additional interests only highlight the excessive nature of InterDigital's exorbitant license fees. Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).

license terms.[1372] InterDigital abused its market dominance also by tying its SEPs with non-SEP licenses; meanwhile, the court held it was not abusive for InterDigital to tie its 2G, 3G, and 4G SEPs as a package.[1373]

C. Administrative Decisions, Regulations, Guidelines

1. In re Qualcomm (2015)

In February 2015, the NDRC issued an administrative penalty decision because Qualcomm violated the *Antimonopoly Law*.[1374] Starting in November 2013, the NDRC spent 14 months investigating Qualcomm's anticompetitive conduct, including potential abuse of the corporation's market dominance in both SEP license markets and baseband chip markets.[1375] The investigation caught much of the world's attention, not only because China's NDRC is representative of an antitrust agency in an emerging economy, but also because Qualcomm is a leading corporation holding abundant amounts of SEPs.[1376]

As a mobile chip giant, Qualcomm owns vast number of SEPs in CDMA, WCDMA, and LTE telecommunication standards.[1377] Qualcomm has over 200 licensees of its wireless technology SEPs,

---

[1372] The court pointed out that Huawei always kept good faith during the licensing negotiation with InterDigital. InterDigital could not simply enjoin good-faith negotiation counterparties from using its SEPs. The court thus ruled that InterDigital's legal actions in the United States was an abuse of InterDigital's market dominance. *Id.*

[1373] Art. 17(1) in the *Antimonopoly Law* provides that: "A business operator with a dominant market position shall not abuse its dominant market position to conduct [the] following acts: … (5) tying products or imposing unreasonable trading conditions at the time of trading without any justifiable cause." The court held that InterDigital abused its market dominance when it tied its SEPs with non-SEP licenses. The rationale was that SEPs are unique and irreplaceable; however, non-SEPs are replaceable. Thus, SEP holders are not allowed to take advantage of standardization to maximize non-SEP license markets. On the other hand, InterDigital did not abuse its market dominance when it tied its global 3G SEPs with global 4G SEPs. The court reasoned that in the wireless telecommunication industry, it is a common and widely adopted practice to license as a package the 2G, 3G, and 4G SEPs granted in different countries. Thus, this global and packaged SEP license was permissible. Zhu Jianjun (祝建军), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan* (标准必要专利权人滥用市场支配地位构成垄断) [*Monopolization when Standard-essential-patent Holders Abuse their Market Dominance*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 10, 13.

[1374] Gaotong Gongsi Feifa Longduan An (高通公司非法垄断案) [In re Qualcomm Inc. Unlawful Antimonopoly] (发改办价监处罚[2015] 1 号) [No. 1 [2015] of the National Development and Reform Commission] (Nat'l Dev. & Reform Comm'n Feb. 9, 2015).

[1375] *See* Xie Guanbin & Jiao Shan (谢冠斌&焦姗), *Jianxi Zhongguo Dui Zhishichanquan Lanyong de Fanlongduan Guizhi Qushi- Ping Gaotong Gongsi Shexian de Zhishichanquan Lanyong Xingwei* (简析中国对知识产权滥用的反垄断规制趋势-评高通公司涉嫌的知识产权滥用行为) [*Analyzing the Tendency of China's Anti-monopoly Regulation on Abusing Intellectual Property- Commenting Qualcomm's Involved Conduct of Abusing Intellectual Property*], ZHONGGUO JIAGE JIANGUAN YU FANLONGDUAN (中国价格监管与反垄断) [PRICE SUPERVISION & ANTI-MONOPOLY IN CHINA], no.8, 2014, at 35, 35.

[1376] *See* Deng Zhisong & Dai Jianmin (邓志松&戴健民), *Jianxi Lanyong Biaozhun Biyao Zhuanli de Xingwei Leixing: Yi Gaotong An Wei Shijiao* (简析滥用标准必要专利的行为类型: 以高通案为视角) [*Analyzing the Conduct Categories of Abusing Standard-essential-patents: Case Study of Qualcomm*], ZHONGGUO JIAGE JIANGUAN YU FANLONGDUAN (中国价格监管与反垄断) [PRICE SUPERVISION & ANTI-MONOPOLY IN CHINA], no.8, 2014, at 38, 38.

[1377] Gaotong Gongsi Feifa Longduan An (高通公司非法垄断案) [In re Qualcomm Inc. Unlawful Antimonopoly] (发改办价监处罚[2015] 1 号) [No. 1 [2015] of the National Development and Reform Commission] (Nat'l Dev. & Reform Comm'n Feb. 9, 2015).

and frequently prevails over counterparties during license negotiations due to its dominance of this market.[1378] In November 2013, Qualcomm was accused by the NDRC of abusing its market dominance in the SEP license market of CDMA, WCDMA, and LTE standards.[1379] Qualcomm was alleged to have charged excessive license fees to Chinese mobile phone manufacturers, and the license fee amounted to approximately 3%-6% of the mobile phone's sale price.[1380] This excessive SEP license fee is the main reason the NDRC commenced this antimonopoly investigation.[1381] The NDRC investigated allegations including: charging license fees based on the final product, tying SEPs with non-SEPs, forcing licensees to have royalty-free and grant-back licenses, and licensing expired SEPs.[1382]

In its decision imposing an administrative penalty, the NDRC reiterated the ruling in *Huawei v. InterDigital*. The NDRC held that each of Qualcomm's SEPs was unique and irreplaceable in each SEP's license market, distinguishing China and the United States as separate SEP licensing markets.[1383] Qualcomm owned 100% market share of each SEP's license market, and therefore had

---

[1378] *Id.*

[1379] *Id.*

[1380] Qi Li(齐力), 2014 *Nian Fanlongduan Diyian: Diaocha Gaotong* (2014 年反垄断第一案:调查高通) [*The First Antimonopoly Case in 2014: Investigating Qualcomm*], ZHONGGUO DUIWAI MAOYI (中国对外贸易) [CHINA'S FOREIGN TRADE], no.3, 2014, at 52, 53.

[1381] Deng Zhisong & Dai Jianmin (邓志松&戴健民), *Jianxi Lanyong Biaozhun Biyao Zhuanli de Xingwei Leixing: Yi Gaotong An Wei Shijiao* (简析滥用标准必要专利的行为类型: 以高通案为视角) [*Analyzing the Conduct Categories of Abusing Standard-essential-patents: Case Study of Qualcomm*], ZHONGGUO JIAGE JIANGUAN YU FANLONGDUAN (中国价格监管与反垄断) [PRICE SUPERVISION & ANTI-MONOPOLY IN CHINA], no.8, 2014, at 38, 38.

[1382] Wang Lihui(王丽慧), *Gong Si Quan Boyi haishi Ronghe: Biaozhun Biyao Zhuanli yu Fanlongduanfa de Hudong* (公私权博弈还是融合: 标准必要专利与反垄断法的互动) [*Competing or Converging of Public and Private Rights: Interaction of Standard-essential-patents and Anti-monopoly Law*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.9, 2014, at 30, 35, Deng Zhisong & Dai Jianmin (邓志松&戴健民), *Jianxi Lanyong Biaozhun Biyao Zhuanli de Xingwei Leixing: Yi Gaotong An Wei Shijiao* (简析滥用标准必要专利的行为类型: 以高通案为视角) [*Analyzing the Conduct Categories of Abusing Standard-essential-patents: Case Study of Qualcomm*], ZHONGGUO JIAGE JIANGUAN YU FANLONGDUAN (中国价格监管与反垄断) [PRICE SUPERVISION & ANTI-MONOPOLY IN CHINA], no.8, 2014, at 38, 39-40, Xie Guanbin & Jiao Shan (谢冠斌&焦姗), *Jianxi Zhongguo Dui Zhishichanquan Lanyong de Fanlongduan Guizhi Qushi- Ping Gaotong Gongsi Shexian de Zhishichanquan Lanyong Xingwei* (简析中国对知识产权滥用的反垄断规制趋势-评高通公司涉嫌的知识产权滥用行为) [*Analyzing the Tendency of China's Anti-monopoly Regulation on Abusing Intellectual Property- Commenting Qualcomm's Involved Conduct of Abusing Intellectual Property*], ZHONGGUO JIAGE JIANGUAN YU FANLONGDUAN (中国价格监管与反垄断) [PRICE SUPERVISION & ANTI-MONOPOLY IN CHINA], no.8, 2014, at 35, 36-37.

[1383] To define an SEP's relevant market, the NDRC further discussed the standard's substitutability and the patented technology's substitutability. Regarding the standard's substitutability, the NDRC stated that, to comply with a specific telecommunication standard, standard implementers (i.e. telecommunications and manufacturers) must invest significant funding into research and development. In addition, telecommunication standards have developed for a long time, so compatibility among different generations (2G, 3G, and 4G) is another entry barrier for a new competing standard. Consequently, there are no feasible substitutes for existing, broadly-adopted (CDMA, WCDMA, and LTE) standards. Regarding the patented technology's substitutability, the NDRC discussed this issue from a demand and supply perspective. On the demand side, the patented technology becomes indispensable once the technology is incorporated into a telecommunication standard. If telecommunication manufacturers cannot get SEP licenses to use the patented technology, their products do not comply with the standard and cannot meet the market demand. On the supply side, each SEP is unique, so no (potential) substitute could exist. Under these circumstances, each SEP's license market is considered as an individual relevant market. Gaotong Gongsi Feifa Longduan An

market dominance.[1384] Qualcomm had abused its market dominance because it tied SEPs together with non-SEPs for licensing and had requested grant-back free-royalty licenses.[1385] In addition to this, the NDRC also decided that Qualcomm had abused its market dominant position when licensing its expired SEPs.[1386] The NDRC eventually ordered Qualcomm to cease the relevant

---

(高通公司非法垄断案) [In re Qualcomm Inc. Unlawful Antimonopoly] (发改办价监处罚[2015] 1 号) [No. 1 [2015] of the National Development and Reform Commission] (Nat'l Dev. & Reform Comm'n Feb. 9, 2015).

[1384] In light of Art. 18 in the *Antimonopoly Law*, the NDRC further discussed the following four issues to determine Qualcomm's market dominance: (1) Qualcomm's market share in the SEP license market; (2) Qualcomm's ability to control the SEP license market; (3) manufacturers' reliance on Qualcomm's SEP; and (4) market entry barriers for Qualcomm's competitors. Firstly, the *Huawei v. InterDigital* case determined that each SEP owner owns 100% market share in each SEP's license market, thereby having market dominance. Qualcomm currently holds many SEPs (not just one SEP) in CDMA, WCDMA, and LTE telecommunication standards. These SEPs could become "SEP portfolios." As a result, Qualcomm's 100% market share is not only in each SEP's license market, but also in each "SEP portfolio's" license market, so no market competition could exist. Qualcomm was therefore assumed to have market dominance in light of Art. 19(1)(a) of the *Antimonopoly Law.* Secondly, Qualcomm has over 200 SEP licensees, so essentially no licensees could counter against Qualcomm's superior market position in the negotiation process. Qualcomm could unilaterally decide the licensing terms and contents. Thus, the NDRC considered Qualcomm to have greater dominance in controlling the license fee and terms, as well as stopping others from entering the market and therefore impacting the market. Thirdly, Qualcomm holds SEP portfolios in different telecommunication standards. Each SEP in the portfolio is indispensable. Not having any one SEP would prevent end products from connecting with the Internet. The products and their manufacturers then cannot meet customers' needs and cannot obtain a government network access license. Thus, manufacturers rely heavily on Qualcomm's SEP license. Finally, when a patented technology is incorporated into a telecommunication standard (e.g. CDMA, WCDMA, LTE), the other competing technologies are excluded from the standard. If the patented technology needs to be changed, this change would cause unacceptable costs to telecommunication operators and manufacturers. Therefore, the market entry barrier is high and competitors can hardly enter the relevant market. *Id.*

[1385] In light of Art. 17(1)(a) in the *Antimonopoly Law*, the NDRC ruled that Qualcomm abused its market dominance by unfairly overcharging royalties. Firstly, Qualcomm requested grant-back royalty-free license, and even had non-assertion clauses in some license agreements. The NDRC indicated that Qualcomm's clauses ignored the value of the licensee's patent, and paid no royalties to the licensees. In the grant-back license, Qualcomm should respect the licensees' innovation and consider the licensees' patent value. Qualcomm then should deduct from the licensee fee, and pay some other consideration. Secondly, Qualcomm licensed SEPs and non-SEPs as a package. However, only SEPs in the package had core value. The SEPs' value lied in the wireless telecommunication technology, rather than microphones, batteries, screens, or cases. Thus, Qualcomm was overcharging when licensing as a package and charging based on end product's sale price. *Id.*

Under Art. 17(1)(e) in the *Antimonopoly Law*, the NDRC ruled Qualcomm had abused its market dominance by tying its non-SEPs without justification. With SEPs, telecommunication manufacturers have no choice but to request for the SEP holders' license. With non-SEPs, manufacturers can design around or choose alternative competing technologies. SEPs and non-SEPs are different and independent. Licensing SEPs and non-SEPs separately have no impact on the patents' value and utilization. In the case, Qualcomm did not license separately, but as a package, and did not offer the licensed patent list. Licensees therefore had less autonomy in choosing non-SEP's competing technology. Qualcomm's tying the SEPs and non-SEPs together excluded other technology providers from competing in the non-SEP field. This exclusion not only suppressed technology innovation but also harmed consumers. *Id.*

[1386] Under Art. 17(1)(a) in the *Antimonopoly Law*, the NDRC held that Qualcomm abused its market dominance by licensing expired SEPs and unfairly overcharging royalties. The NDRC indicated that Qualcomm offered no licensed patent list when licensing with a long-term, even indefinite-duration, agreement and none-change royalties. Because the licensed subject matter was unclear, licensees were duped into paying royalties for some expired SEPs. Qualcomm may have even intended to add new patents to the licensed

anticompetitive conduct and imposed on Qualcomm a fine of 6.088 billion RMB, equivalent to 8% of Qualcomm's China revenue in 2013.[1387] This fine is the largest amount ever imposed by the Chinese government since it started to enforce its *Antimonopoly Law*.

2. SAIC Provisions on Prohibiting IP Abuse (2015)

When Qualcomm was under investigation, the Chinese government had already begun drafting guidelines to govern antimonopoly problems found in IP and SEPs.[1388] Although the government has discussed the issue for years and even drafted numerous guidelines, China has a limited history of and experience in its antitrust and patent system.[1389] The drafted guidelines therefore remain highly debated today.[1390] While the draft guidelines were still in discussion, SAIC issued the first Chinese IP-antimonopoly instructions, *Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition* ("Provisions").[1391] The SAIC's Provisions were issued in April 2015 and took effect in August 2015.[1392] As the first IP-antitrust instruction, the Provisions are of great value in application with

---

patent portfolio to replace the expired SEPs. Without the licensed patent list, the licensees could not evaluate the new patents' value and assess changes made to the whole portfolio. *Id.*

[1387] *Id.* 6.088 billion RMB is rougly the equivalent of $934.17 million USD under the exchange rate of 6.517 on March 8, 2016.

[1388] *See* YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 506-507 (2011), Yi Jiming (易继明), *Jinzhi Quanli Lanyong Yuanze zai Zhishichanquan Lingyu zhong de Shiyong* (禁止权利滥用原则在知识产权领域中的适用) [*The Application of the Principle of the Prohibition of Abuse of Rights in the Field of Intellectual Property*], ZHONGGUO FAXUE (中国法学) [CHINA LEGAL SCI.], no.4, 2013, at 39, 39, Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3.

[1389] *See* Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3, Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 43.

[1390] *See* Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3, Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 43.

[1391] *See* Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3, Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 43.

[1392] Guojia Gongshang Xingzheng Guanli Zongju Guanyu Jinzhi Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei de Guiding (国家工商行政管理总局关于禁止滥用知识产权排除、限制竞争行为的规定)

Article 55 of the *Antimonopoly Law*. The Provisions should be helpful in resolving future SEP disputes.[1393]

The Provisions stipulate in detail the complicated IP-antitrust issues, which include determining relevant market and market dominance, scenarios of monopolistic conduct, and the results of antitrust violations.[1394]

- First, as discussed in Articles 3 and 6 respectively in the Provisions, IP issues should be considered when defining relevant markets and deciding market dominance.
- The Provisions then illustrated scenarios in which a party may violate the *Antimonopoly Law.* These scenarios include: implementing monopolistic agreements as discussed in Articles 4 and 5, abusing one's dominant market position as discussed in Articles 7 to 11, conducting monopolistic acts in patent pools as discussed in Article 12, and standard-setting as discussed in Article 13.
- The final sections of the Provisions address the treatment of antitrust violations. This treatment includes: investigation procedures as seen in Article 14, analysis methods as seen in Articles 15 and 16, and penalties as seen in Article 17.

Of the monopolization scenarios mentioned above, an SEP holder should have the greatest concern over the Provisions on abusing market dominance and standard-setting.[1395] The Provisions as written suggest that once SEP holders have been determined to possess market dominance (like in *Huawei v. InterDigital* and *In re Qualcomm*) and can offer no justification, they cannot refuse to license, tie in, and discriminatorily price.[1396] Additionally, SEP holders cannot have unreasonable restrictions in licensing their SEPs, such as imposing exclusive grant-back, adding non-assertion clause, licensing expired or invalid patents.[1397] Article 13 in the Provisions governs the SEP problem.[1398] Under Article 13, if SEP holders participate in the standard-setting process and can offer no justification for the failure, then they are not allowed to intentionally fail to disclose their SEPs.[1399] Likewise, they are not allowed to argue against standard-implementers for the SEPs that they abandoned in the standard-setting process.[1400] If SEP holders violate the FRAND rule, they are prohibited from refusing to license, tying in, and imposing unreasonable transaction terms.[1401]

[Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition] (promulgated by the St. Admin. Indus. & Com., Apr. 7, 2015, effective Aug. 1, 2015) ST. COUNCIL GAZ., Jun. 20, 2015, at 11 (China).

[1393] *See* Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 3.

[1394] *See id.*

[1395] *See* Wang Xianlin (王先林), *Sheji Zhuanli de Biaozhun Zhiding he Shishi zhong de Fanlongduan Wenti* (涉及专利的标准制定和实施中的反垄断问题) [*Anti-monopoly Issues in the Setting and Enforcement of Standard Related to Patent*], FAXUEJIA (法学家) [JURIST], no.4, 2015, at 62, 64-70.

[1396] Art. 8, 9, 11 of the SAIC Provisions on Prohibiting IP Abuse.

[1397] Art. 10 of the SAIC Provisions on Prohibiting IP Abuse.

[1398] Wang Xianlin (王先林), *Sheji Zhuanli de Biaozhun Zhiding he Shishi zhong de Fanlongduan Wenti* (涉及专利的标准制定和实施中的反垄断问题) [*Anti-monopoly Issues in the Setting and Enforcement of Standard Related to Patent*], FAXUEJIA (法学家) [JURIST], no.4, 2015, at 62, 64.

[1399] Art. 13 of the SAIC Provisions on Prohibiting IP Abuse.

[1400] *Id.*

[1401] *Id.*

As the first IP-antitrust instruction in China, the Provisions to some extent may help to reduce the controversy surrounding SEP problem. However, despite SAIC's efforts and the Provision's value, the ambiguity in the Provisions is likely to engender its own set of problems. Given China's short history in antimonopoly enforcement, without relevant decisions and instructions, these ambiguous terms may only complicate SEP protection and further muddle enforcement. Whether the ambiguity and uncertainty may be resolved will depend on the forthcoming Antimonopoly Guidelines for IP Abuse.

3. Antimonopoly Guidelines for IP Abuse (drafted) (2015)

In 2015, both the *In re Qualcomm* and SAIC's Provisions garnered significant attention from both foreign and domestic corporations in China. Both the decision in *In re Qualcomm* and the newly issued Provisions may further restrict a patentee's exploitation of exclusive rights. Consequently, SEP or IP holders are concerned over how the Chinese government will enforce its antimonopoly regulation. The forthcoming *Antimonopoly Guidelines for the Abuse of Intellectual Property* ("Guidelines") will therefore be critical in shedding light on this situation.

However, it would be unreasonable to expect the State Council to issue new Guidelines in a short amount of time.[1402] Problems have arisen among China's domestic central government agencies and ministries. The Chinese government has three administrative agencies (NDRC, SAIC, MOFCOM) that enforce its antimonopoly regulations.[1403] Each of these agencies is separately helping the State Council draft the Guidelines.[1404] For example, the SAIC started working on its draft in 2009.[1405] Yet later, the NDRC announced its draft in October 2015.[1406] Given the lack of collaboration, these agencies may compete with one another, as may their resulting draft Guidelines.[1407] The lack of coordination may prove problematic in the future, particularly as the State Council will need to integrate these different drafts and then issue a finalized Guideline that is acceptable for all three agencies.[1408]

D. Patent Intervention Summary

[1402] Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2-3, Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 43.

[1403] YIN XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] 507-508 (2011).

[1404] Interview with TWUNI-1, 2015.

[1405] Ren Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of the Provisions Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1, 2.

[1406] Guanyu Lanyong Zhishichanquan de Fanlongduan Zhinan Zhengqiu Yijian Gao (关于滥用知识产权的反垄断指南(征求意见稿)) [Antimonopoly Guidelines for the Abuse of Intellectual Property(Draft for Asking Comments)], http://www.sdpc.gov.cn/gzdt/201512/t20151231_770313.html (China).

[1407] Interview with TWUNI-1, 2015.

[1408] *See* Wang Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34, 43.

As a whole, China's antitrust intervention in SEP disputes is gradually transitioning from specific administrative and judicial decisions in individual cases to general administrative provisions and guidelines. In the beginning when China commenced its antitrust system in 2008 and revised its compulsory license provisions in 2009, China did not have a clear plan for how to handle the antimonopoly problem in IP or SEPs. The problem was complicated, because it involved a balance between public interests of consumers and industry and private rights of patentees. The problem was also challenging because China's patent and antitrust systems are still in their nascent stages.

It was not until *Huawei v. InterDigital* in 2013 and *In re Qualcomm* in 2015 that the Chinese court and administrative agencies started developing instructions on how to analyze the antimonopoly issue in SEP disputes. As the first judicial decision and administrative decision, *Huawei v. InterDigital* and *In re Qualcomm* are of great value to domestic and foreign corporations in China's market. In light of these two decisions, the following may be summarized about China's antitrust intervention in SEP disputes:

(1) Chinese antitrust enforcement narrowly defines the relevant market. Each SEP's license market is regarded as an individual relevant market. And, the United States and Chinese are regarded as two separate territorial markets.
(2) Because of the narrow definition, an SEP holder owns 100% market share of each SEP's license market, and then owns market dominance.
(3) As a package license, tying non-SEPs with SEPs violates the *Antimonopoly Law* in China; however, tying SEPs with other SEPs is allowed.
(4) Tying expired SEPs into a package is prohibited.
(5) An SEP holder who requests a grant-back free-royalty license would be in violation of the *Antimonopoly Law*.
(6) Discriminatory-pricing and overpricing by an SEP holder would be regarded as abusing the SEP holder's market dominance.

After the NDRC issued its *In re Qualcomm* decision, the Chinese government was eager to issue relevant guidelines or provisions that clarify when an SEP holder's conduct constitutes an abuse of its exclusive rights. Chinese antitrust intervention in SEP consequently began to apply general principles instead in its guidelines and provisions. At present, the State Council and its subordinate antimonopoly agencies are working on the Antimonopoly Guidelines for IP Abuse. However, the lack of coordination among the three agencies may delay a final draft of the Guidelines.

Even though it is unlikely that the new Guidelines will be issued any time soon, the SAIC has already put into force the SAIC Provisions on Prohibiting IP Abuse in August 2015. These Provisions impose greater restrictions on SEP holders. Once an SEP holder is considered to be market dominant, as in *Huawei v. InterDigital* and *In re Qualcomm*, and can offer no justification, the following conducts are prohibited by the Provisions: refusing to license, tying in, imposing exclusive grant-back, adding non-assertion clauses, licensing invalid patents, intentionally failing to disclose SEPs in standard-setting process.[1409] The Provisions therefore further restrict an SEP holder's freedom to exploit their exclusive rights. SEP holders therefore are concerned over the issue of antimonopoly in the Chinese market.

IV. **Conclusion**

[1409] Art. 8,9,11 of the SAIC Provisions on Prohibiting IP Abuse.

This chapter has described the treatment of patent remedies and antirust intervention in SEP disputes under PRC law. Establishing its patent system in 1984 and antitrust system in 2008, China has a fairly brief history in patent and antitrust enforcement. Due to China's booming economy, SEP disputes emerged before China had finished developing its patent and antitrust systems. Thus, it is an immense challenge for the Chinese government to handle the complicated problems that are raised in SEP cases. As the government continues to develop its SEP regulations, both domestic and foreign corporations will pay close attention to China's evolving legal landscape.

Unlike the United States, China tends to address the SEP problem through active and strict antimonopoly intervention. In *Huawei vs. InterDigital* and *In re Qualcomm*, the Chinese court and antimonopoly agency applied antitrust intervention to restrict the patentees' exclusive rights. To address antimonopoly problems raised by SEPs, the government then issued the SAIC Provisions on Prohibiting IP Abuse. In early 2016, the draft Antimonopoly Guidelines for IP Abuse were available for public comment, and may be finalized in the near future. The Chinese government has analyzed the antimonopoly problem in SEPs through a variety of forms, including judicial decisions, administrative decisions, administrative regulations and administrative agency guidelines. Given that the government tends to intervene in SEP disputes by means of antitrust regulations, patentees may be concerned about how to exercise their rights in the Chinese market.

Although the Chinese legal community currently focuses on antitrust issues related to SEP, SEP patent remedies are emerging at the same time in the Chinese courts. Based on evolving case law and the proposed SPC 2015 Judicial Interpretation, Chinese courts have developed a rough model to solve the remedies problem. The model emphasizes the nature of standards and disclosure of SEPs, and provides guidance on possible scenarios and the general principles that Chinese judges should consider to determine royalties and grant injunctions. Because few SEP cases have been litigated in China, the model requires further development in some areas such as the meaning of FRAND principles and "significantly less".

Although China and the United States have distinct histories in the development of SEP protection and enforcement, both markets continue to influence one another. The next chapter will discuss the different regulatory approaches and regulatory competition between the United States and China.

Chapter 7 Analysis

I. Introduction

The United States has dominated the global economy for decades. China's entry into the global economy has shifted the balance of power. As China moved away from an economy based on low-skill, low-technology manufacturing and began to move up the production value chain towards high-technology manufacturing and knowledge industries, the balance in the global economy shifted. After World War II, the United States was the dominant economy in the world. In later decades, Western Europe, Japan and Russia began to challenge U.S. dominance. More recently, the rapid economic rise of China is now a major challenge to the U.S. as well as to the European Union, Japan and Russia. The focus of this dissertation is on the growing economic rivalry between the U.S. and China.

This chapter will analyze how the global economy is affected by Sino-American regulatory competition from the perspectives of technology standard-setting and standard essential patent ("SEP") protections. As discussed in Chapters 3 and 5, the United States has a voluntary standardization system and a relatively mature mechanism of SEP protections. In the American market, the private sector controls the market and the role of government is limited. Both the U.S. government and the American private sector favor self-regulation, a system in which the government avoids intervening in the market as much as possible. As discussed in Chapters 4 and 6, China has a centralized standardization system where SEP protections are only beginning to receive attention from the People's Republic of China ("PRC") government and from Chinese industry. When China opened its doors to the world economy, many of its domestic industries were not competitive or innovative. Because of this and because the PRC Constitution mandates that China will pursue socialism, the PRC government assumed the responsibility of improving the national economy. The PRC government also set standardization and IP policies as part of its national strategy.

The United States and China have quite different standardization systems and SEP protections. The competition between these two countries merits attention as to whether their competition will impact their original standardization systems and SEP protections. Therefore, this chapter will discuss the following three issues:

- Whether the United States will transform its bottom-up standardization system and whether China will change its top-down standardization system in the future;
- Whether the United States will change its hands-off position regarding antitrust intervention in SEP and whether China will decrease its antitrust intervention in SEP in the future; and
- Whether the United States will decrease its SEP remedy award and whether China will increase its SEP remedy award.

II. Interviewees

To better understand the three issues above, the author conducted interviews with experts from the United States, China, and Taiwan. Table 7-1 below lists the general information of the interviewees.

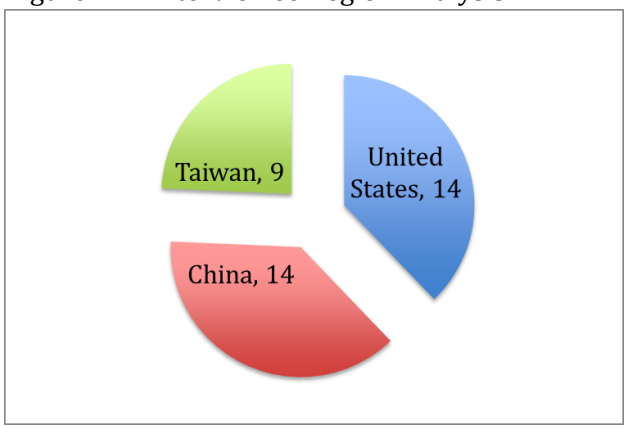
Table 7-1: Interviewees Information

	Universities	Government Institution	Research Institute	Industrial Association	Hi-tech Enterprises
U.S.	5	3	1	2	3
China	8	4	1	0	1
Taiwan	3	0	4	0	2

Source: compiled by the author

Among the 37 interviewees, 14 were from the United States, 14 were from China, and 9 were from Taiwan.[1410] In terms of diversity, 6 interviewees were from high-tech enterprises, 7 were from government institutions, 6 were from research institutes, 2 were from industrial associations, and 16 were from universities. Although the majority of the interviewees were from universities, the interviewees consisted of a mix of professors from law school, engineering school, business school, and the department of economics. Some of the university professors served as former government officials or consultants. The interviews with these professors brought a diversity of views and opinions. Figure 7-1 and Figure 7-2 offers a background analysis of the 37 interviewees by region and professions respectively.

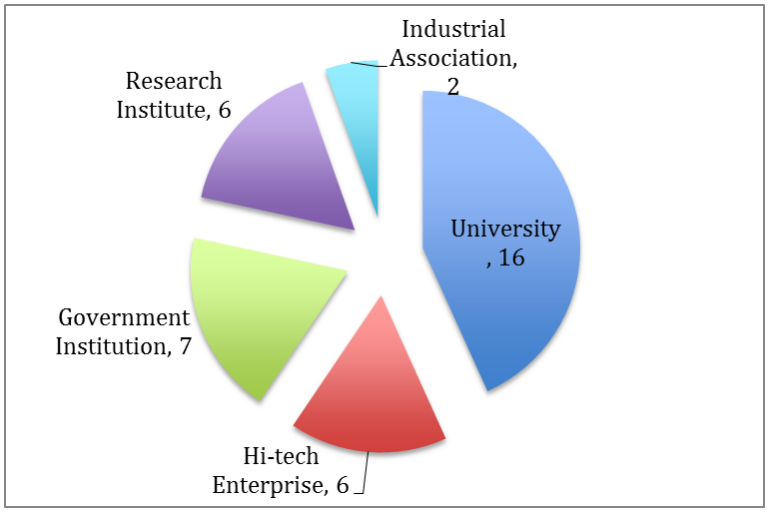
Figure 7-1: Interviewee Region Analysis



Source: Compiled by the author

[1410] Although the political situation between China and Taiwan is controversial, most of the interviewees from Taiwan have direct connections or experience in China, such as teaching at universities in Mainland China, doing business in the Chinese market, and collaborating with Chinese institutions.

Figure 7-2: Interviewee Profession Analysis



Source: Compiled by the author

III. Competition in Standard-setting

A. Current Situation

As discussed in Chapters 3 and 4, the United States and China have very different standardization systems. The American system is market-driven and the private sector takes the leading role in the standard-setting process. In contrast, the Chinese system is centralized and the government takes the primary responsibility for standard development.

The American voluntary standardization system is considered the most decentralized standard setting system in the world.[1411] With historical roots in the colonial era, the standardization system was formed under a tradition of local control, meritocracy, voluntarism, and rights to represent one's own interests.[1412] The system has an evident preference for private coordination of commercial activity.[1413] Since standardization first began in the United States, standard-setting institutions have not changed much, and still remain a decentralized and pluralistic collection of institutions.[1414] The decentralized governance of standardization gives voice to a diversity of opinions and approaches.[1415] Its bottom-up, informal, flexible, market-led approach also provided

[1411] Wang Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* 14 (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).
[1412] Andrew L. Russell, *Industrial Legislatures: The American System of Standardization*, *in* INTERNATIONAL STANDARDIZATION AS A STRATEGIC TOOL: COMMENDED PAPERS FROM THE IEC CENTENARY CHALLENGE 2006 70, 71-72 (Int'l Elec. Comm'n ed., 2006).
[1413] *Id.*
[1414] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? 71 (2013). *See also* Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).
[1415] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIV (2013). *See also* Michelle Egan, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51, 62 (2002).

open access to the private sector.[1416] Both the diversity and open access helped the American domestic industry respond quickly to new challenges brought by rapidly-changing technology and disruptive market shifts.[1417]

In contrast, the Chinese standardization system was formed during China's period of a planned economy and under the influence of the Soviet Union.[1418] Although China later opened its doors to the global economy in the 1980s, its standardization system retained characteristics of a planned economy, and these traits did not change significantly as time wet by.[1419] China's standardization system is highly hierarchical and government-led.[1420] The Chinese central and local governments administer the standard-setting process, as well as formulate and research standards.[1421] China places the development of standards within the context of its overall process of planning for economic development, and regards standardization as a national strategy to improve its national economy.[1422] China has recently come to realize that its standardization system is not well-suited for its strategy to move its industries up the production value chain and expand its knowledge economy industries.[1423] The Chinese government thus adopted a new policy of *Strengthening Standardization Reform* in 2015, aimed at improving its standardization system.[1424]

[1416] DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIII, 49 (2013).

[1417] *Id.* at XIII, XIV.

[1418] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[1419] *See* WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 11 (2010), Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9.

[1420] *See* Chaoyi Zhao & John M. Graham, *The PRC's Evolving Standards System: Institutions and Strategy*, 2 ASIA POL'Y 63, 64 (2006).

[1421] WANG ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [BASIC INTRODUCTION TO STANDARDIZATION] 39, 43, 53 (2010).

[1422] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 5, Xudong Gao & Jianxin Liu, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817, 828 (2012).

[1423] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[1424] *See* Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China), Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知)

The American and Chinese standardization systems sometimes highlight the cultural differences between the two countries. The American tradition tends to mistrust the government,[1425] and to rely on the market and private sector to direct its commercial activities. In contrast, Chinese society expects economic leadership to come from the Chinese Communist Party ("CCP") and to be executed by government leaders. However, as the U.S. and China increasingly find themselves engaged in economic and regulatory competition in global markets, each nation will enjoy certain advantages and disadvantages as a result of its culture and traditions. To the extent that national leaders in the U.S. and China are focused on competing successfully in global markets, they may be forced to consider adopting domestic policies that are inconsistent with their culture and traditions in order to succeed. As a result, this chapter predicts how the respective nations' standard-setting regulations will change due to future competition and how their interactions will influence one another. The interviews as follow in this research mainly focuses on the following:

- Whether the American government will continue its market-led and bottom-up approaches to the governance of standard-setting activities. The United States' voluntary standardization system has led to competing technology standards and standard-setting organizations ("SSOs").[1426] This kind of competition has sometimes brought chaos to the market.[1427] SEPs also drive the private sector, incentivizing competition in standard-setting activities.[1428] The disorder and competition may hinder standardization development, as well as restrict small but innovative firms from participating in standard-setting activities.[1429] In addition, the American government's policy of deregulating financial markets received great criticism after the Global Financial Crisis of 2007-2009.[1430] Given China's use of the standardization system as a national tool to lead its domestic industry and its successes in competing within global commerce, this chapter examines whether the United States will continue to adhere to its policy of letting the private sector lead in standard development.
- Whether the Chinese government will change its government-led and top-down approaches to govern its standardization development. Although at a superficial level, China's top-down, centralized approach to standard-setting might appear to be very efficient, in practice, the lack of communication and coordination among government institutions often renders the resulting standards ineffective, overlapping and conflicting with one another.[1431] China's standards rely heavily on the government and its government-funded research institutes,

---

[Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).

[1425] Except for all the money the U.S. government spends on defense/military, which is one of the primary engines of innovation in the U.S. economy.

[1426] *See* DIETER ERNST, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? XIV (2013).

[1427] *See id.*

[1428] *See id.* at XV.

[1429] *See id.* at XIV, XV.

[1430] *See id.* at 34-35.

[1431] *See* ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] 14 (2014), Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).

which often have a limited understanding of the market.[1432] In addition, as standard adopters, the Chinese private sector plays a limited role in setting standards.[1433] The lack of private-sector participation has led to low quality standards that diverge from market needs.[1434] Now that China has opened its doors to the global economy, both Chinese domestic corporations and consumers recognize the merits of technology innovation. The Chinese domestic industry is also growing progressively innovative in upgrading its technology. This chapter discusses whether and to what extent the Chinese government will change its centralized policies for standardization development.

B. Possible Future Directions

1. The United States Will Likely Continue Its Bottom-up Model

Many interviewees felt that the United States will not change its bottom-up, market-driven standardization model despite global competition and its competition with China.[1435] The private sector and SSOs will continue to dominate the standards-setting process in the United States. The American government is unlikely to increase its intervention in the standard-setting process, and instead will probably continue to play a limited role that it currently plays.[1436] The interviewees pointed to the United States' established tradition of restricted government intervention in the market. Given this history and tradition, the resulting standards typically arise out of market competition.[1437] The United States just needs to follow the market, and does not need to change its standardization system.[1438] At least one American expert though it is more appropriate for China to move its standardization system in the direction of the market if China wants to become more

---

[1432] *See* Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 10.

[1433] *See* Wang Ping & Liang Zheng (王平&梁正), *Woguo Xiehui he Lianmeng de Biaozhunhua Fazhan Yanjiu* (我国协会和联盟的标准化发展研究) [*Study on Evolution of Standardization in National Associations and Alliances*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.8, 2013, at 59, 62, DAN BREZNITZ & MICHAEL MURPHREE, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS 5 (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014), ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] 44-47 (2007).

[1434] *See* Wang Ping, Wang Yiyi & John Hill (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4, 8, Wang Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6, 9-10, KUANG BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) 163 (2011).

[1435] Interview with USGOV-1, 2015, interview with USGOV-2, 2015, interview with USREA-1, 2015, interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USASS-1, 2015.

[1436] Interview with USGOV-2, 2015.

[1437] Interview with USGOV-1, 2015.

[1438] Interview with USGOV-1, 2015.

globally competitive.[1439] Instead, the United States will only intervene in a limited number of situations, such as in instances of a smart grid industry for the standard-setting process.[1440]

Although the standardization process itself might appear to an outsider to lack order and efficiency, SSOs and competition is explicitly designed to produce broadly acceptable standards by engaging directly with the market.[1441] In contrast, China's centralized process for standardization development often results in standards that cannot achieve widespread adoption in market, which ultimately waste resources because the standards did not incorporate enough input from representatives of end-users and producers.[1442] The China's Time Division-Synchronous Code Division Multiple Access ("TD-SCDMA") standard is a good example that illustrates this scenario.[1443] The government is even less qualified than the private sector to predict what participants in the market will ultimately prefer.[1444] Rather, markets produce results by helping to articulate and then aggregate individual preferences that are themselves dynamic. Even market participants cannot predict with certainty what outcomes markets will produce, as demonstrated by the recent standards war between the competing Blu-Ray and HD-DVD video standards.[1445] The decentralized, "market-driven" U.S. consortia-based standards system enjoys a competitive advantage over more centralized standard setting process in global markets because it is designed to keep the distance between standard-setters, producers and end-users as small as possible. While the reforms of the Chinese standardization system are designed to make it more "market responsive" it will remain more centralized than the American system. Furthermore, as long as China maintains a "Socialism with Chinese Characteristics" political system, its standardization system will be required to factor CCP and PRC government policies into their decision making processes which will in turn reduce its capacity to focus on market developments.

The case study on telecommunication standards demonstrates the problems that competing standards and SSOs engender for the American regime. For example, the Worldwide Interoperability for Microwave Access ("WiMax") wireless technology may compete with Universal Mobile Telecommunications System ("UMTS") telecommunication technology, creating competing standards.[1446] In terms of SSOs, the Institute of Electrical and Electronics Engineers ("IEEE") also competes with the Telecommunications Industry Association ("TIA") or 3rd Generation Partnership Project 2 ("3GPP2").[1447] The competition between technology standards and SSOs has only resulted in no U.S.-based standards existing in the current 4G era.[1448] These results though do not mean that American corporations have failed in competing within the 4G market.[1449] Rather, American enterprises continue to influence developing 4G standards.[1450] They still actively participate in activities within the 3rd Generation Partnership Project ("3GPP"), and still engage in proposing 4G

[1439] Interview with USGOV-1, 2015.
[1440] Interview with USREA-1, 2015.
[1441] Interview with USCOM-3, 2016.
[1442] Interview with USCOM-2, 2016, interview with CNUNI-5, 2015.
[1443] Interview with CNUNI-5, 2015, interview with USUNI-5, 2016.
[1444] Interview with USCOM-2, 2016.
[1445] *See also* Nabyla Daidj, Cristina Grazia & Abdelhakim Hammoudi, *Introduction to the Non-Cooperative Approach to Coalition Formation: The Case of the Blu-Ray/HD-DVD Standards' War*, 23(4) J. MEDIA ECON. 192 (2010).
[1446] Interview with USCOM-2, 2016, interview with USCOM-3, 2016.
[1447] Interview with USCOM-2, 2016, interview with USCOM-3, 2016.
[1448] Interview with USCOM-2, 2016, interview with USCOM-3, 2016.
[1449] Interview with USUNI-5, 2016.
[1450] Interview with USUNI-5, 2016, interview with TWREA-3, 2015, interview with TWREA-4, 2015.

standard specifications.[1451] Despite the fact that no U.S.-based 4G standards exist, American corporations still own many of the existing 4G SEPs.[1452]

Today, China has improved its performance getting Chinese domestic standards recognized as international standards by official international standard-setting bodies, such as the International Organization for Standardization ("ISO") and International Telecommunication Union ("ITU").[1453] For instance, China has its TD-SCDMA in 3G telecommunication technology, Time Division Long Term Evolution ("TD-LTE") in 4G telecommunication technology, as well as WLAN Authentication and Privacy Infrastructure ("WAPI") in wireless technology. China exploits the meeting rules in official international standard-setting bodies, forming several working groups and strategic alliances with select African countries.[1454] These working groups and alliances are formed to protect China's proposed standards, ensuring that they are accepted during standard-setting meetings.[1455] However, such improved performance is likely limited only to these kinds of "official" international standard-setting bodies, where each nation has a single and equal right to participate in the standard-setting meeting.[1456] Outside of these official organizations, China is unlikely to have such success in standard-setting activities, because most Chinese firms continue to lack innovative capacity to compete in the global market.[1457] Therefore, China's recent development in international standard-setting will only have a limited influence on American attitudes toward its own standardization policy.

The United States is unlikely to change its voluntary standard-setting system. Although the bottom-up system may appear to outsiders to be disorganized and wasteful, the private sector engenders the most innovative technological solutions as it utilizes the smartest people in the market.[1458] This is why technology originating from standard-setting activities in the American market is both reliable and innovative.[1459]

2. China Will Likely Change to a Bottom-up Model with Limitations

China's *Strengthen Standardization Reform* is directed at changing the current Chinese standardization system to better connect with the market. This Reform has begun to transform many aspects of the Chinese standard-setting system. In the past, government officials always actively organized and led standard-setting meetings, but now sometimes these officials are passively invited by the private sector to join in standard-setting meetings for association standards.[1460] In addition, the Chinese government formerly promoted its Indigenous Innovation policy as one part of its overall strategy to increase Chinese influence in global standard setting activities..[1461] At the time, China developed these indigenous standards to protect its growing domestic industry.[1462] Although at one level, its Indigenous Innovation policy was designed to increase China's national success in global markets, at another level it was designed to protect domestic industry from global competition which is more likely to erode China's national success in

[1451] Interview with USUNI-5, 2016
[1452] Interview with TWREA-3, 2015, interview with TWREA-4, 2015.
[1453] Interview with CNUNI-6, 2015, interview with USASS-1, 2015.
[1454] Interview with CNUNI-6, 2015.
[1455] Interview with CNUNI-6, 2015.
[1456] Interview with USASS-1, 2015.
[1457] Interview with USASS-1, 2015.
[1458] Interview with USASS-1, 2015.
[1459] Interview with USASS-1, 2015.
[1460] Interview with CNGOV-4, 2016.
[1461] Interview with CNUNI-6, 2015.
[1462] Interview with USCOM-2, 2016.

global markets, not increase it .[1463] As some Chinese domestic firms are growing more innovative and competitive without depending on China's Indigenous Innovation policy to protect them from global competition, both Chinese government and private sector began to question the value of the Indigenous Innovation policy.[1464] In addition, the Indigenous Innovation policy was widely criticzed by China's major trading partners as disguised protectionism. As the shortcomings of the Indigenous Innovation policy are becoming more obvious to Chinese leaders, support for that policy is fading.[1465]

China now recognizes the problems caused by isolating itself from global competition through its Indigenous Innovation policy.[1466] The problems of isolationism can best be illustrated by China's telecommunication standards. China's TD-SCDMA standard led the government to realize it was not possible to isolate itself from the world and then independently develop its own indigenous standards.[1467] The Chinese government invested nearly the maximum financial support to develop the 3G standard, but the effort only resulted in limited success.[1468] When joining the 4G standard competition, China changed to accept internationally accepted Long Term Evolution ("LTE") standardized technology, rather than insisting on independently developing its own indigenous standard.[1469] China followed LTE standardized technology and instead proposed its own Time Division ("TD") technology in the 4G standard.[1470]

In addition, the current Chinese government appears to have decided that its role should only be limited to "reminding" domestic enterprises the importance of technology standards and SEPs.[1471] In the long run, China's technological innovations and industrial development should rely on the private sector instead of the government.[1472] China's standardization development should also rely heavily on the innovative capacity of domestic enterprises.[1473] In the future, Chinese standards will likely be primarily developed by competition in the domestic market, bearing similarities to the American market.[1474]

It is unlikely that China's standardization system will come to resemble very closely the United States' voluntary system. Although the Chinese government now says the official party line is "Socialism with Chinese Characteristics" instead of Marxist-Leninist-Mao Zedong thought, it remains a socialist country and the CCP remains the ruling party. Despite some changes to deregulate the market, the PRC government will continue to maintain some oversight and control over the standard-setting process. For example, in the *Strengthen Standardization Reform*, industrial associations are now authorized to develop association standards. As a result, foreign corporations can in theory increase their participation in standard-setting activities in China.[1475] However, if there is a risk of foreign corporations controlling or dominating the development process for association standards, the PRC government will not adopt association standards as

[1463] Interview with USCOM-2, 2016.
[1464] Interview with CNUNI-5, 2015, interview with CNCOM-1,,2015.
[1465] Interview with CNUNI-5, 2015, interview with CNCOM-1, 2015.
[1466] Interview with USUNI-5, 2016.
[1467] Interview with USUNI-5, 2016.
[1468] Interview with USUNI-5, 2016.
[1469] Interview with USUNI-5, 2016.
[1470] Interview with USUNI-5, 2016.
[1471] Interview with CNUNI-6, 2015.
[1472] Interview with CNUNI-6, 2015, interview with CNGOV-2, 2015.
[1473] Interview with CNUNI-6, 2015, interview with CNGOV-2, 2015.
[1474] Interview with CNGOV-2, 2015.
[1475] Interview with CNGOV-3, 2015, interview with USCOM-1, 2016, interview with USCOM-2, 2016.

industrial standards or national standards.[1476] As a result such implicit restrictions on the ability of foreign corporations to participate in standard setting activities in China may remain limited. The new standards policy still lacks transparency because it reflects characteristics of China's hybrid socialist/market economy system and the CCP's role as both the economic and political leader of China.[1477] The leadership of the CCP in both economic and political matters is a fundamental characteristic of life in China and there is no reason to believe it will change any time soon.[1478]

Therefore, just as there are profound structural limitations on how much the U.S. can change its standardization system in response to the challenges of competing in global markets, there are also profound structural limitations on how much China can change its standardization system in response to the challenges of competing in global markets. Because Chinese leaders now appear to recognize that a more direct connection between its standardization system and competition in global markets is a good strategy for promoting growth in China's domestic economy, they are signaling that they will permit some more direct connections to develop. However, it is also likely that changes to China's standardization system will remain superficial notwithstanding this new government policy. [1479] It is inconceivable that China would ever adopt a "market-driven" system like the one in the U.S. The transformation of China's system to a more "market-responsive" system will likely be subject to some limitations and be implemented with certain "ceilings."[1480] The transformation to a "market-responsive" will only take place in technology areas that China is competitive in, such as partial information and communication technology ("ICT") industries.[1481] In these specific industries, the standardization development process will appear to be market-driven and bottom-up, though the process itself is hardly completely voluntary.[1482] As for other industries in China, the standardization development process will retain its original hierarchical model.[1483] Consequently, the recent reform in Chinese standardization system will only take place in certain technological areas with limitations, and while older policies will remain unchanged in other technological areas.

IV. Competition in SEP Protections

A. Antitrust Intervention

1. Current Situation

As discussed in Chapters 5 and 6, the United States and China apply different approaches as to whether the government should use antitrust intervention to address SEP disputes. Table 7-2 summarizes these two countries' respective intervention policies through antitrust in SEP disputes from 1996 to 2015.

In the beginning, the American government believed that SEP problems can cause antitrust violations that harm competition and consumers. When SEP disputes first emerged, the Department of Justice ("DOJ") and Federal Trade Commission ("FTC") held an active and strict

[1476] Interview with CNGOV-3, 2015.
[1477] Interview with TWUNI-3, 2016.
[1478] Interview with TWUNI-3, 2016.
[1479] Interview with USCOM-1, 2016.
[1480] Interview with USCOM-1, 2016.
[1481] Interview with USCOM-1, 2016.
[1482] Interview with USCOM-1, 2016.
[1483] Interview with USCOM-1, 2016.

position in antitrust enforcement as seen in *In re Dell, In re Union Oil Co. of Cal,* and *In re Rambus*.[1484] The DOJ and FTC later loosened their positions, evidenced by the DOJ's business review letters to the Institute of Electrical and Electronics Engineers, Inc. ("IEEE") and VMEbus International Trade Association ("VITA"). The more liberal antitrust policy on SEP matters could also be seen in the DOJ and FTC's joint guidelines issued in 2007, the *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition* (hereinafter "DOJ and FTC 2007 Guidelines").[1485] After the seminal cases of *Rambus v. FTC* and *Hynix v. Rambus*, filing an antitrust argument against SEP holders in the jurisdiction of the United States became progressively more difficult.[1486] As a consequence, most SEP disputes turned to pursuing private patent remedies in the courts instead.[1487]

In contrast, the topic of antitrust intervention in SEPs has been hotly debated in China since 2009. The controversy remains a hot issue today as antitrust intervention may be useful to counter against SEPs' exclusive rights and can protect China's growing enterprises and industry. *Huawei v. InterDigital* and *In re Qualcomm* decisions are recent examples that demonstrate the Chinese government's position in antitrust regulations.[1488] Moreover, the government enforced in August 2015 *Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition* (hereinafter "SAIC Provisions on Prohibiting IP Abuse"), and is now drafting *Antimonopoly Guidelines for the Abuse of Intellectual Property* (hereinafter "Antimonopoly Guidelines for IP Abuse").[1489] The government plans to

---

[1484] *See In re Dell*, 121 F.T.C. 616 (1996) (No. C-3658), *available at* http://www.ftc.gov/system/files/documents/cases/960617dellconsentorder.pdf (last visit date: April 16, 2015), *In re Union Oil Co. of Cal.*, No. 9305 (F.T.C. July 27, 2005), *available at* http://www.ftc.gov/sites/default/files/documents/cases/2005/08/050802do.pdf (last visit date: April 16, 2015), 2006 FTC LEXIS 60 (F.T.C. Aug. 2, 2006).

[1485] *See* Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Robert A. Skitol, Drinker, Biddle & Reath, LLP (2006), *available at* http://www.justice.gov/atr/public/busreview/219380.pdf (last visit date: April 16, 2015), Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Michael A. Lindsay, Dorsey & Whitney LLP (2007), *available at* http://www.justice.gov/atr/public/busreview/222978.pdf (last visit date: April 16, 2015), U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION (2007).

[1486] *See* Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008), Hynix Semiconductor, Inc. v. Rambus, Inc., 609 F. Supp. 2d 988 (N.D. Cal. 2009).

[1487] *See, e.g.,* Microsoft Corp. v. Motorola, Inc., 696 F.3d 872 (9th Cir. Wash. 2012), Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), Apple Inc. v. Motorola, Inc.,110 U.S.P.Q.2D 1695 (Fed. Cir. Apr. 25, 2014), Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014).

[1488] *See* Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013), Gaotong Gongsi Feifa Longduan An (高通公司非法垄断案) [In re Qualcomm Inc. Unlawful Antimonopoly] (发改办价监处罚[2015] 1 号) [No. 1 [2015] of the National Development and Reform Commission] (Nat'l Dev. & Reform Comm'n Feb. 9, 2015).

[1489] *See* Guojia Gongshang Xingzheng Guanli Zongju Guanyu Jinzhi Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei de Guiding (国家工商行政管理总局关于禁止滥用知识产权排除、限制竞争行为的规定) [Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition] (promulgated by the St. Admin. Indus. & Com., Apr. 7, 2015, effective Aug. 1, 2015) ST. COUNCIL GAZ., Jun. 20, 2015, at 11 (China), Guanyu Lanyong Zhishichanquan de Fanlongduan Zhinan Zhengqiu Yijian Gao (关于滥用知识产权的反垄断指南(征求意见稿)) [Antimonopoly Guidelines for the Abuse of Intellectual Property (Draft for Asking Comments)], http://www.sdpc.gov.cn/gzdt/201512/t20151231_770313.html (China).

establish general antitrust principles to handle SEP issues rather than merely rely on specific decisions. Given these outcomes, the government may emphasize antitrust intervention in addressing future SEP dispute.

Table 7-2: Evolving SEP Antitrust Regulations in the United States and China

Year.Mo	Nation		Name	Characteristic		
	U.S.	China		Administrative	Judicial	Legislative
1996.5	X		*In re Dell* [i]	X		
2005.7	X		*In re Union Oil Co. of Cal* [ii]	X		
2006.8	X		*In re Rambus* [iii]	X		
2006.10	X		VITA Business Review Letter [iv]	X		
2007.4	X		IEEE Business Review Letter [v]	X		
2007.4	X		DOJ and FTC 2007 Guidelines [vi]	X		
2007.9	X		*Broadcom v. Qualcomm* [vii]	X		
2008.4	X		*Rambus v. FTC* [viii]		X	
2008.12	X		*Qualcomm v. Broadcom* [ix]		X	
2009.3	X		*Hynix v. Rambus* [x]		X	
2009.10		X	Patent Law 3rd Reform in Compulsory License [xi]			X
2013.10		X	*Huawei v. InterDigital* [xii]		X	
2015.2		X	*In re Qualcomm* [xiii]	X		
2015.8		X	SAIC Provisions on Prohibiting IP Abuse [xiv]	X		
2015.10		X	Antimonopoly Guidelines for IP Abuse (drafted) [xv]	X		

i. *In re Dell*, 121 F.T.C. 616 (1996) (No. C-3658), *available at* http://www.ftc.gov/system/files/documents/cases/960617dellconsentorder.pdf (last visit date: April 16, 2015).
ii. Decision and order, *In re Union Oil Co. of Cal.*, No. 9305 (F.T.C. July 27, 2005), *available at* http://www.ftc.gov/sites/default/files/documents/cases/2005/08/050802do.pdf (last visit date: April 16, 2015).
iii. 2006 FTC LEXIS 60 (F.T.C. Aug. 2, 2006).
iv. Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Robert A. Skitol, Drinker, Biddle & Reath, LLP (2006), *available at* http://www.justice.gov/atr/public/busreview/219380.pdf (last visit date: April 16, 2015).
v. Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., Dep't of Justice, to Michael A. Lindsay, Dorsey & Whitney LLP (2007), *available at* http://www.justice.gov/atr/public/busreview/222978.pdf (last visit date: April 16, 2015).
vi. U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION (2007).
vii. Broadcom Corp. v. Qualcomm, Inc., 501 F.3d 297 (3rd Cir. 2007).
viii. Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).
ix. Qualcomm Inc. v. Broadcom, Corp., 548 F.3d 1004 (Fed. Cir. 2008).
x. Hynix Semiconductor, Inc. v. Rambus, Inc., 609 F. Supp. 2d 988 (N.D. Cal. 2009).
xi. Zhuanli Fa (专利法) [Patent Law] (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008, effective Oct. 1, 2009) 2009 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 27 (China).
xii. Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).
xiii. Gaotong Gongsi Feifa Longduan An (高通公司非法垄断案) [In re Qualcomm Inc. Unlawful Antimonopoly] (发改办价监处罚[2015] 1 号) [No. 1 [2015] of the National Development and Reform Commission] (Nat'l Dev. & Reform Comm'n Feb. 9, 2015).
xiv. Guojia Gongshang Xingzheng Guanli Zongju Guanyu Jinzhi Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei de Guiding (国家工商行政管理总局关于禁止滥用知识产权排除、限制竞争行为的规定) [Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property to Preclude or Restrict Competition] (promulgated by the St. Admin. Indus. & Com., Apr. 7, 2015, effective Aug. 1, 2015) ST. COUNCIL GAZ., Jun. 20, 2015, at 11 (China).
xv. Guanyu Lanyong Zhishichanquan de Fanlongduan Zhinan Zhengqiu Yijian Gao (关于滥用知识产权的反垄断指南(征求意见稿)) [Antimonopoly Guidelines for the Abuse of Intellectual Property (Draft for Asking Comments)], http://www.sdpc.gov.cn/gzdt/201512/t20151231_770313.html (China).

Source: Compiled by the author

As of 2009, the American government has applied a hands-off approach in antitrust intervention for SEP disputes; meanwhile, the Chinese government is focusing on antitrust intervention as a solution to SEPs. This part of this chapter discusses the respective nations' regulatory positions and considers whether these policies will change due to future competition and the respective influence these two countries have on one another. The interviews as follow in this research mainly focus on the following:

- Whether American antitrust enforcement will continue applying a hands-off approach in SEP treatment. The interviews discuss whether American antitrust agencies will continue to avoid the use of antitrust regulations to intervene in market operation, under which SEP holders exploit their private rights. Either China or Europe tends to use antitrust investigation to avoid SEP holders from abusing their exclusive rights.[1490] Given China's significant and influential role in the world economy, the interviews also discuss whether the American government will likely change its deregulation policies or hands-off approach regarding antitrust enforcement in SEP disputes.
- Whether China's government will apply fewer antitrust interventions for SEPs in the future. The Chinese government recently emphasized applying antitrust regulations to counter-balance SEP's exclusive rights, thereby protecting its domestic industry. However, if China's antitrust intervention is too severe or active, the intervention will cause much restriction and uncertainty on SEP or IP protection in PRC jurisdiction. The restriction and uncertainty will deter the incentive for innovation and cause much concern of foreign investors as a result. Such antitrust regulations and their results may be harmful to the China's growing economy.

The following section considers possible future directions in United States and China SEP policies by means of antitrust regulations in light of the interviews conducted by the author.

2. Possible Future Directions

a The United States Will Likely Continue Its Hands-Off Approach in Regulating SEPs

Since the *Rambus v. FTC* court decision in 2008, the U.S. government has generally taken a hands-off approach to enforcement of antitrust law in SEP disputes. Despite this general policy, American antitrust agencies hold different opinions as to this hands-off treatment.[1491] The DOJ has maintained that the government should enforce antitrust regulations to help solve hold-up problems.[1492] FTC committees on the other hand are split as to whether the government should intervene in SEP disputes by means of antitrust enforcement.[1493] The inconsistent views among federal agencies and courts differ greatly from that of China, because Chinese government institutions appear to maintain a generally more consistent position on certain issues.[1494] Despite the differences in opinion, the DOJ and FTC generally support the mechanisms for either SSOs or patent pools.[1495] The federal agencies generally respect the standard-setting activities of SSOs and patent pools and try to avoid imposing restriction on these market activities.[1496]

[1490] Interview with USCOM-2, 2016, interview with USUNI-3, 2016, interview with USUNI-2, 2016, interview with TWUNI-1, 2015.
[1491] Interview with USUNI-3, 2016, interview with USCOM-2, 2016.
[1492] Interview with USCOM-2, 2016.
[1493] Interview with USCOM-2, 2016.
[1494] Interview with USCOM-2, 2016.
[1495] Interview with USUNI-3, 2016, Maureen K. Ohlhausen, Commissioner, Fed. Trade Comm'n, Address at the 9th International Conference on Standardization and Innovation in Information Technology (Oct. 6, 2015).
[1496] Interview with USUNI-3, 2016.

In addition, there are two important factors that help to explain why the American government intervenes less with antitrust in the treatment of SEPs: the difficulty of proving market dominance and the tendency to deregulate.

- First, since 1980, American antitrust enforcement was intended to protect consumer welfare from the exploitation of dominant enterprises in the market.[1497] In terms of SEPs, because it is so hard to define what an SEP relevant market is, the American government struggled to determine whether SEP holders possessed market dominance.[1498] This is one of primary reasons that the American government seldom enforces its antitrust regulations to address SEP disputes.
- Secondly, since 1980, the American government tended to deregulate antitrust enforcement, including standard-setting activities as well.[1499] As a result, American antitrust regulators are silent as to the utilization of standard-setters for SEPs in the market.

Many interviewees considered that the relationship between SEP disputes and application of U.S. antitrust law was still evolving.[1500] In light of the current reluctance of U.S. government agencies to undertake antitrust enforcement actions related to SEP disputes, the most important legal issues in these disputes now tend to be defined by contract and patent law.[1501] In addition, considering that each country applies its own antitrust laws differently, focusing on private contract law issues in SEP disputes can reduce the impact of inconsistent national enforcement of antitrust measures in global markets, as well as affording enterprises greater predictability and certainty with regard to the legal status of patent claims that read on important standards.[1502]

More importantly, it may also be beneficial for American business interests if parties can resolve SEP disputes through private dispute resolution. By treating litigation of SEP issues as a private dispute, the private sector has more freedom to fully debate and discuss how to address the SEP issue at hand.[1503] This debate and discussion may increase openness and transparency in the legal field, benefitting industrial development.[1504] In contrast, if SEPs are treated as a public antitrust matter, the process for antitrust enforcement may be less transparent to private business interests.[1505] Treating SEPs as an antitrust issue also leaves room for private enterprises to lobby and engage in rent-seeking behavior.[1506]

b China Will Likely Decrease Intervention with Limitations

Under the current structure of the World Trade Organization ("WTO"), there are no antitrust rules.[1507] Because of this, different countries can establish their own antitrust policies according to

---

[1497] Interview with USUNI-3, 2016.
[1498] Interview with USUNI-3, 2016.
[1499] Interview with USUNI-3, 2016.
[1500] Interview with USCOM-1, 2016, interview with USUNI-2, 2016, interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USUNI-3, 2016.
[1501] Interview with USCOM-1, 2016, interview with USUNI-2, 2016, interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USUNI-3, 2016.
[1502] Interview with USCOM-2, 2016.
[1503] Interview with USUNI-3, 2016.
[1504] Interview with USUNI-3, 2016.
[1505] Interview with USUNI-3, 2016.
[1506] Interview with USUNI-3, 2016, interview with CNCOM-1, 2015.
[1507] *See also* MICHAEL W. DOWDLE, JOHN GILLESPIE, & IMELDA MAHER, ASIAN CAPITALISM AND THE REGULATION OF COMPETITION: TOWARDS A REGULATORY GEOGRAPHY OF GLOBAL COMPETITION LAW (2013), Andrew Guzman, *The Case for International Antitrust*, 22 BERKELEY J. INT'L LAW 355 (2004).

their respective economic situations.[1508] In the very short history of China's antitrust enforcement, some outside observers believe that the PRC government has selectively and unfairly enforced its antitrust regulations in order to protect Chinese domestic enterprises.[1509] It is therefore no surprise that some outside observers believe that the PRC government will enforce its antitrust laws in a similar manner when resolving SEP issues that arise in the PRC jurisdiction.[1510]

When China opened its doors to the global economy, it was very explicit about its policy of protecting state owned enterprises; however, before China joined the WTO there was no legal barrier to engaging in explicit protectionism. Because foreign enterprises possessed more innovative technology, the Chinese government intervened in the market to protect its nascent technology industry.[1511] In China's current industry, most domestic enterprises are either small-or-medium sized enterprises that may lack innovative capacity because they lack the human and financial capital to engage in conventional research and develoment.[1512] Consequently, they seek the government's protection from the competition or exploitation of foreign enterprises.[1513] Even though the PRC government has invested considerable resources into research and development, most of these resources were distributed to research institutes and mechanisms for diffusion of research from those institutes to the private sector are not yet well developed in China.[1514] Since it is currently difficult for the innovation results of research institutes to be commercialized and utilized in the market, the government's investment has not yet contributed very much to China's economic growth.[1515] Until China has time to strengthen mechanisms for the commercialization of research results from its academic institutions, it will remain difficult for many Chinese enterprises to compete with Western enterprises in ICT innovation. Now that China is a WTO member, it can no longer overtly, explicitly discriminate in favor of domestic industry at the expense of foreign industry outside certain limited areas including national security, public health, morals and antitrust.[1516] It is therefore very likely that the PRC government will consider using antitrust or other regulatory approaches to protect its domestic industry.[1517]

China's excessive protection or intervention policies have been criticized by foreign investors as "nationalistic protectionism."[1518] Some observers inside and outside China have suggested that in the long run though, these policies will only hinder China's continued economic development.[1519] Today, China already owns competitive enterprises in the global market, such as Huawei, ZTE, Xiaomi, and Tecent.[1520] The justifications in the past for China's market intervention may not longer be valid, as Chinese enterprises make progress in moving up the production value chain.[1521] The consequences of the government's intervention may discourage foreign corporations from

[1508] Interview with USUNI-2, 2016, interview with TWUNI-1, 2015, interview with USASS-2, 2016.
[1509] Interview with TWUNI-1, 2015.
[1510] Interview with USUNI-2, 2016, interview with TWUNI-1, 2015.
[1511] Interview with USUNI-2, 2016, interview with CNUNI-1, 2015, interview with CNUNI-6, 2015.
[1512] Interview with CNUNI-1, 2015, interview with CNUNI-6, 2015. *But see* HUANG, YASHENG, CAPITALISM WITH CHINESE CHARACTERISTICS: ENTREPRENEURSHIP AND THE STATE (2008).
[1513] Interview with CNUNI-1, 2015, interview with CNUNI-6, 2015.
[1514] Interview with CNREA-1, 2015.
[1515] Interview with CNREA-1, 2015.
[1516] WTO GATT Articles XX and XXI
[1517] Interview with CNREA-1, 2015.
[1518] Interview with USUNI-3, 2016.
[1519] Interview with USUNI-3, 2016.
[1520] Interview with USUNI-3, 2016, interview with CNUNI-5, 2015, interview with CNUNI-1, 2015.
[1521] Interview with USUNI-3, 2016.

transferring their most advanced technologies into the Chinese market.[1522] Today, the Chinese domestic economy may not require the most advanced technologies to satisfy consumer demand.[1523] However, in the future, the demand for high-level technology will certainly increase due to Chinese consumers recognizing the benefits of advanced technology.[1524] Without the support of foreign investment, China's continual use of antitrust enforcement will only harm China's future economic and social development.[1525] Foreign observers of China's economic policies believe that China may retard instead of accelerating its future economic development if it uses antitrust enforcement policy as a tool to protect uncompetitive Chinese domestic industries from foreign competition instead of as a tool to maximize consumer welfare by promoting competition in domestic markets.

In addition to debating whether the brief history of China's enforcement of its new *Antimonopoloy Law* indicates that the PRC government is unfairly targeting foreign enterprises as part of a policy of protectionism, China's legal community also debates whether the government should continue applying antitrust regulations in SEP disputes. Many of the interviewees criticized the recent decisions in *Huawei v. InterDigital*, *In re Qualcomm,* SAIC Provisions on Prohibiting IP Abuse ("Provisions"), and drafted Antimonopoly Guidelines for IP Abuse ("Guidelines").[1526]

- The interviewees suggested the rationales in *Huawei v. InterDigital* and *In re Qualcomm* are unclear and perhaps even simplistic.[1527] In particular, they found that the rationales in the two decisions did not explain clearly why each SEP's license market is considered an individual relevant market.[1528] The definition of the relevant market might be too narrow, and if so, this might allow Chinese antitrust agencies to undertake antitrust investigation and enforcement too easily.[1529] Evidence that the PRC will strictly enforce the new *Antimonopoly Law* in SEP disputes is a cause of great concern for SEP holders.[1530] This concern appears to be shared by both foreign and Chinese domestic enterprises.[1531]
- The recently issued Provisions received the most criticism from both foreign and domestic enterprises.[1532] Critics of the Provisions note that they only consist of general principles that have the effect of expanding the authority of China's *Antimonopoly Law* enforcement agencies, which in turn impacts jurisdictional issues at the national level. The Provisions also seem to impose serious restrictions on SEP holders' utilization of exclusive rights in a variety of scenarios.[1533] Because of *In re Qualcomm* and the Provisions, many Chinese domestic enterprises started refusing to pay Qualcomm any royalties.[1534] As the Provisions have only taken effect recently as of this writing, it is unclear how the Chinese government

[1522] Interview with USUNI-3, 2016.
[1523] Interview with TWCOM-1, 2015, interview with TWREA-3, 2015.
[1524] Interview with CNUNI-5, 2015.
[1525] Interview with USUNI-3, 2016.
[1526] Interview with CNUNI-1, 2015, interview with CNUNI-5, 2015, interview with CNUNI-7, 2015, interview with CNCOM-1, 2015.
[1527] Interview with CNUNI-7, 2015, interview with CNUNI-5, 2015.
[1528] Interview with CNUNI-7, 2015, interview with CNUNI-5, 2015.
[1529] Interview with CNUNI-7, 2015, interview with CNUNI-5, 2015.
[1530] Interview with CNUNI-7, 2015, interview with CNUNI-5, 2015, interview with CNUNI-4, 2015.
[1531] Interview with CNUNI-7, 2015, interview with CNUNI-5, 2015, interview with CNUNI-4, 2015.
[1532] Interview with CNCOM-1, 2015, interview with CNUNI-1, 2015.
[1533] Interview with CNCOM-1, 2015.
[1534] Interview with CNUNI-5, 2015, interview with CNUNI-7, 2015. Some domestic enterprises even think the PRC government's SEP policy is appropriate and wonderful.

will enforce the Provisions.[1535] Despite its newness, the Provisions already have much influence and are of primary concern to domestic and foreign patentees.[1536]

- Since the Provisions impose serious restrictions on enterprises that hold SEPs, the forthcoming Guidelines are expected to replace the Provisions and may reduce the tension caused by the Provisions.[1537] The three Chinese antitrust agencies are now drafting the Guidelines.[1538] However, the current PRC regime is getting more centralized and government-controlled.[1539] In terms of the forthcoming Guidelines, the three antitrust agencies are competing to have the final say in what level of restrictions should be imposed on SEP holders in order to gain State leaders' favor.[1540] Given this competition, it is unlikely that the forthcoming Guidelines will loosen antitrust intervention in SEPs significantly.[1541]

If China chooses to use strong antitrust interventions in SEP disputes, then there is a risk that some patent holders may "hold-out" technologies from the Chinese industry.[1542] Because patentees are concerned about antitrust enforcement, they may prefer not to have their patented technology incorporated into standards.[1543] If the patented technology is not incorporated into the standards, the patent will not be considered an "SEP" and will not fall under the governance of Chinese antitrust regulations.[1544] If this "hold-out" problem arises, it may harm standardization development in China if no alternative solutions can be found.

The current level of antitrust intervention in SEPs may also be incongruent with China's economy and society.[1545] Generally speaking, Chinese society is recognizing the benefits of advanced technology and the importance of innovation protection. This is especially true after China has connected with the global economy.[1546] This growing recognition is particularly prominent in the younger generation, so it has been easier to discuss with young government leaders the ideas of IP and innovation protection.[1547] However, these young leaders usually hold low-level positions and do not have the authority to make significant decisions.[1548] In contrast, high-level government leaders authorized to make significant decisions are often under the influence of traditional planned-economy thinking.[1549] They take for granted the government's role in market operation.[1550] These high-level government leaders used to be hostile to patent protection,

---

[1535] Interview with CNCOM-1, 2015.
[1536] Interview with CNUNI-5, 2015, interview with CNUNI-7, 2015, interview with CNUNI-4, 2015.
[1537] Interview with CNUNI-1, 2015, interview with CNCOM-1, 2015.
[1538] *See* Chapter 6 for further discussion.
[1539] Interview with TWUNI-1, 2015.
[1540] Interview with TWUNI-1, 2015.
[1541] Interview with TWUNI-1, 2015.
[1542] Interview with CNUNI-2, 2015, interview with CNUNI-7, 2015. *See also* Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1153, 1161, 1163 (2009), Mark A. Lemley & Philip J. Weiser, *Should Property or Liability Rules Govern Information?* 85 TEX. L. REV. 783, 786-788 (2007), Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293, 1298, footnote 9 (1996).
[1543] Interview with CNUNI-2, 2015, interview with CNUNI-7, 2015.
[1544] Interview with CNUNI-2, 2015, interview with CNUNI-7, 2015.
[1545] Interview with CNUNI-5, 2015.
[1546] Interview with CNUNI-5, 2015.
[1547] Interview with CNUNI-5, 2015.
[1548] Interview with CNUNI-5, 2015.
[1549] Interview with CNUNI-5, 2015.
[1550] Interview with CNUNI-5, 2015.

particularly because of past experiences in "patent trapping."[1551] Because of this, it is difficult to convince these leaders to refrain from interfering in the market and restricting patentees.[1552] These same high-level leaders assume the primary responsibility for making recent antitrust regulations in SEPs.[1553] As a result, the current Chinese government adheres to a mostly traditional planned-economy thinking in handling new SEP issues.[1554]

In addition, reliance on the government's protection may not help Chinese enterprises compete in domestic or international markets.[1555] It is unclear whether protecting Chinese enterprises with China's new *Antimonopoly Law* will ultimately promote or hinder the competitiveness of individual Chinese enterprises or the Chinese economy generally. Given the size of China's market, it is without a doubt that the market is large enough that the government can formulate its own market rules, such as antitrust regulations or IP protection.[1556] However, some Chinese enterprises are becoming aware that market competition and global commerce actually can help them develop substantially.[1557] Use of the PRC *Antimonopoly Law* by the Chinese government to protect private enterprises from competition may ultimately reduce their ability to compete in global markets if the PRC government does not also pressure companies to focus on understanding and satisfying consumer demand in global markets. In China, Huawei and Datang telecommunication corporations are good examples of domestic Chinese enterprises that have successfully made the transition to focusing on understanding and satisfying consumer demand in global markets and so are unlikely to seek protection behind PRC government enforcement of antitrust law.[1558]

Unlike many Chinese corporations, Huawei chose to follow global commerce rules and competed with global multinational corporations ("GMNCs").[1559] Huawei ultimately developed substantially, and now owns approximately 10% of telecommunication SEPs in the global market.[1560] In contrast, Datang, which originated from China's state-owned enterprises ("SOEs") and had a strong relationship with the government, had limited success in the domestic market.[1561] Under the government's excessive protection, Datang had limited access to the domestic and global market. As a result, its proposed technology in the TD-SCDMA standard was not very competitive and experienced limited success in the domestic market.[1562] Given these two primary examples, the

---

[1551] Interview with CNCOM-1, 2015. *See also* RICHARD P. SUTTMEIER, YAO XIANGKUI & ALEX ZIXIANG TAN, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY 10-12 (2006), RICHARD P. SUTTMEIER & YAO XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM 4, 11, 12(2004).
[1552] Interview with CNUNI-5, 2015, interview with CNCOM-1, 2015.
[1553] Interview with CNUNI-5, 2015.
[1554] Interview with CNUNI-5, 2015.
[1555] Interview with CNUNI-5, 2015. *See also* HA-JOON CHANG, KICKING AWAY THE LADDER: DEVELOPMENT STRATEGY IN HISTORICAL PERSPECTIVE (2002), KEITH E. MASKUS, INTELLECTUAL PROPERTY RIGHTS IN THE GLOBAL ECONOMY 27-84 (2000).
[1556] Interview with TWCOM-1, 2015.
[1557] Interview with CNUNI-5, 2015.
[1558] Interview with CNUNI-5, 2015.
[1559] Interview with CNUNI-5, 2015. However, some people might believe that Huawei is not really a private enterprise. They believe Huawei looks like a successful company but is really a puppet for the Chinese military.
[1560] Interview with CNUNI-5, 2015, interview with TWUNI-3, 2016.
[1561] Interview with CNUNI-5, 2015.
[1562] Interview with CNUNI-5, 2015.

Chinese government should be cautious in the future when applying any regulation, such as antitrust laws, for the purpose of protecting its domestic industry.[1563]

This discussion on how best to apply antitrust regulations in IP has been evolving in the Chinese legal community.[1564] When China first implemented its *Antimonopoly Law* in 2008, Chinese antitrust scholars and antitrust agency officers were unfamiliar with the IP system and its influence on innovation.[1565] Their positions on IP were often unfavorable to IP holders, because they regarded IP's exclusive rights as monopoly rights.[1566] Their analysis of the intersection of antitrust law, IP law and innovation policy was underdeveloped.[1567] Today though, when discussing the same IP-antitrust issue, these antitrust experts are now much more open to considering the impact of IP law and innovation policy on antitrust enforcement policy.[1568] These experts are now emphasizing on the balance between protecting the domestic industry and facilitating technological innovation.[1569] Given this change in opinions, although its current antitrust intervention in SEPs remains strong, the Chinese government seems to loose its antitrust enforcement since 2008.[1570]

Although the PRC government appears open to the idea of loosening the enforcement of its antitrust regulations in the area of SEPs, it is unlikely that the Chinese government will ever adopt a "hands-off" approach to its antitrust intervention in SEP.[1571] In ancient Chinese society, the saying goes that "the people can never surpass government officials."[1572] This old adage meant that the government should always control private market activities.[1573] In ancient China, the government sold crucial market goods such as salt, wine, and iron. This tradition remains true to this day.[1574] The current PRC government has maintained its tradition and history of heavy regulations, which are echoed in antitrust regulations of market activities.[1575] In the future, even if the government seldom restricts SEPs' exclusive rights through antitrust intervention, the government will still retain similar IP-antitrust regulations.[1576] The regulations will serve as a deterrent for patentees not to abuse their exclusive patent rights.[1577]

B. Patent Remedy

[1563] *See also* YANRUI WU, CHINA'S ECONOMIC GROWTH: A MIRACLE WITH CHINESE CHARACTERISTICS (2004), ERIC HARWIT, CHINA'S TELECOMMUNICATIONS REVOLUTION (2008).
[1564] Interview with CNCOM-1, 2015.
[1565] Interview with CNCOM-1, 2015.
[1566] Interview with CNCOM-1, 2015. However, many people outside of China might also have the same position or opinion.
[1567] Interview with CNCOM-1, 2015.
[1568] Interview with CNCOM-1, 2015.
[1569] Interview with CNCOM-1, 2015, Liu Jian, Deputy Director, Nat'l Dev. & Reform Comm'n, Address at the International Symposium on Legal Reforms in Standard Essential Patents Context (Nov. 18, 2015).
[1570] Interview with CNCOM-1, 2015. However, China's *Antimonopoly Law* started to go into effect in 2008. What happened in 2008 was the very first policy. It does deserve much more time to observe the evolving change.
[1571] Interview with CNCOM-1, 2015.
[1572] Interview with CNCOM-1, 2015.
[1573] Interview with CNCOM-1, 2015. *See also* TONY SAICH, GOVERNANCE AND POLITICS OF CHINA (3d ed. 2011).
[1574] Interview with CNCOM-1, 2015. *See also* TONY SAICH, GOVERNANCE AND POLITICS OF CHINA (3d ed. 2011).
[1575] Interview with CNCOM-1, 2015.
[1576] Interview with CNCOM-1, 2015, interview with CNUNI-6, 2015.
[1577] Interview with CNUNI-6, 2015.

1. Current Situation

Private disputes regarding SEP remedies are still emerging in both the PRC and United States, as discussed in Chapters 5 and 6. The following Table 7-3 summarizes SEP remedies disputes in these two countries. These disputes occurred pretty early in Chinese courts in 1997, but many issues are still under serious debate in the Chinese legal community. In contrast, the American government issued most of its SEP remedy decisions after 2012 when all relevant public antitrust disputes were settled. Moreover, many recent United States SEP regulations have influential instructions in deciding reasonable royalties and granting injunctive relief. As a result, some remedies have been finalized in the United States unlike in China.

From 2012 to 2014, the United States government discussed SEP injunction and damages extensively. The ultimate decision in *Apple v. Motorola* was not to grant SEP holders injunctive relief or exclusionary orders in general because of the patentees' "fair, reasonable, and non-discriminatory ('FRAND')" license commitment.[1578] The American court's decision and agencies' guidelines also permitted few exceptions to their general positions.[1579] In terms of damages, *Microsoft v. Motorola* and *In re Innovatio* formulated a clear infrastructure to calculate SEPs' reasonable royalties.[1580] *Commonwealth Sci. & Indus. Research Organisation ("CSIRO") v. Cisco* and *Ericsson v. D-Link* also confirmed the application of the *Georgia Pacific* factors and hypothetical negotiation method.[1581] Today, what remains unsolved is the significant issue of how the smallest salable patent-practicing unit ("SSPPU") is applied.[1582] The *Microsoft v. Motorola* and *In re Innovatio* decisions were based on the IC chips in electronic devices, but *Ericsson v. D-Link* has not yet affirmed this.[1583] Instead, *Ericsson v. D-Link* merely indicated that SEP royalty calculations should be based on the patented feature, not the final product.[1584] Moreover, the SEP reasonable royalties determined in *CSIRO v. Cisco* was not on the basis of SSPPU. Under these circumstances, more cases will be needed to figure out how the American courts ultimately calculate reasonable royalties.

Even though Chinese courts had a similar SEP remedies dispute in 1997, most of the relevant instructions on SEP remedies are still developing today. From 1997 to 2014, China indeed experienced a lot of changes in SEP protection. These approaches on SEP protection began with unavailable judicial relief in *Tianjin Harbour Engineering Research Institute ("THERI") v. Comprehensive Institute of Geotechnical Investigation & Surveying ("CIGIS")*.[1585] The approach later led to absolute restrictions in *Ji Qiang, Liu Hui v. Chaoyang Xingnuo,* and ultimately to reasonable

---

[1578] *See* Apple Inc. v. Motorola, Inc., 110 U.S.P.Q.2D 1695 (Fed. Cir. Apr. 25, 2014).
[1579] *See id.*, U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS (2013).
[1580] *See* Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013).
[1581] *See* Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014), Commonwealth Sci. & Indus. Research Organisation v. Cisco Sys., 809 F.3d 1295 (Fed. Cir. Dec. 3, 2015).
[1582] Interview with USUNI-2, 2016.
[1583] *See* Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013), Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014).
[1584] *See* Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014).
[1585] *See* Tianjin Gangwan Gongcheng Yanjiusuo Su Zonghe Kancha Yanjiu Shejiyuan (天津港湾工程研究所诉综合勘察研究设计院) [Tianjin Harbour Engineering Research Institute v. Comprehensive Institute of Geotechnical Investigation & Surveying] ((1996)二中知初字第 49 号)[No. 49 (1996) of the Beijing No.2 Intermediate People's Court](Beijing No.2 Interm. People's Ct. Feb. 18, 1997).

restriction in *Huawei v. InterDigital* and *Zhang Jingting v. Hengshui Ziyahe*.[1586] In 2015, both the Supreme People's Court ("SPC") and State Intellectual Property Office ("SIPO") respectively proposed their judicial interpretation and *Patent Law* reform on the SEP remedies issue.[1587] Both the interpretation and reform remain ineffective, but they provide at the very least evidence of the Chinese government's position on SEP protection. Only under certain circumstances will the government render SEP holders reasonable royalties and injunctive relief. The circumstances include if the at-issue SEP is incorporated into a voluntary standard, whether the patentee fulfills its disclosure duty, and whether the patentee acts in good-faith.[1588] Otherwise, the court will not grant injunctions and merely renders low royalties to the SEP holder.

Table 7-3 : Evolving SEP Remedy Regulations in the United States and China

Year.Mo	Nation		Name	Characteristic		
	U.S.	China		Administrative	Judicial	Legislative
1997.2		X	*THERI v. CIGIS* [i]		X	
2008.7		X	*Ji Qiang, Liu Hui v. Chaoyang Xingnuo* [ii]		X	
2012.6	X		FTC 2012 Statement in Investigation Nos. 337-TA-745 and 337-TA-752.1 [iii]	X		
2012.9 (2015.7)	X		*Microsoft v. Motorola* [iv]		X	
2013.1	X		Policy Statement for SEPs Subject to Voluntary F/RAND Commitments [v]	X		
2013.4 (2015.7)	X		*Microsoft v. Motorola* [vi]		X	
2013.5	X		*Realtek v. LSI* [vii]		X	
2013.8	X		Presidential Veto in Apple v. Samsung [viii]	X		
2013.9	X		*In re Innovatio* [ix]		X	
2013.10		X	*Huawei v. InterDigital* [x]		X	
2014.1		X	Regulatory Measures on National Standards Involving Patents (Interim) [xi]	X		
2014.1		X	*Zhang Jingting v. Hengshui Ziyahe* [xii]		X	
2014.4	X		*Apple v. Motorola* [xiii]		X	
2014.12	X		*Ericsson v. D-Link* [xiv]		X	
2015.2		X	SPC 2015 Judicial Interpretation in Article 25(drafted) [xv]		X	
2015.4		X	Patent Law 4th Reform in Article 85 (drafted) [xvi]			X

[1586] *See* Ji Qiang yu Liu Hui Su Chaoyang Xingnuo Jianzhu Gongcheng Youxian Gongsi (季强与刘辉诉朝阳兴诺建筑工程有限公司)[Ji Qiang, Liu Hui v. Chaoyang Xingnuo Constr. Ltd.] (最高人民法院(2008)民三他字第 4 号) [No. 4 (2008) of the Supreme People's Court) (Sup. People's Ct. Jul. 8, 2008), Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013), Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (最高人民法院(2012)民提字第 125 号) [No. 125 (2012) of the Supreme People's Court] (Sup. People's Ct. Jan. 2, 2014).

[1587] *See* Zuigao Renmin Fayuan Guanyu Shenli Qinfan Zhuanliquan Jiufen Anjian Yingyong Falv Ruogan Wenti de Jieshi Er Zhengqiu Yijian Gao (最高人民法院关于审理侵犯专利权纠纷案件应用法律若干问题的解释(二)(征求意见稿)) [Interpretation of the Supreme People's Court on Several Issues concerning the Application of Law in the Trial of Patent Infringement Dispute Cases (Part Two)(Draft for Asking Comments)], http://www.hfiplaw.cn/?p=2809 (China), Zhonghua Renmin Gongheguo Zhuanli Fa Xiuding Caoan Songshen Gao (中华人民共和国专利法修订草案(送审稿)) [Drafted Amendment of Patent Law of People's Republic of China (Draft for Approval)], http://www.chinalaw.gov.cn/article/cazjgg/201512/20151200479591.shtml (China).

[1588] *See* Chapter 6 for further discussion regarding the circumstances.

2015.12	X		CSIRO v. Cisco [xvii]		X	

i. Tianjin Gangwan Gongcheng Yanjiusuo Su Zonghe Kancha Yanjiu Shejiyuan (天津港湾工程研究所诉综合勘察研究设计院) [Tianjin Harbour Engineering Research Institute v. Comprehensive Institute of Geotechnical Investigation & Surveying] ((1996)二中知初字第 49 号)[No. 49 (1996) of the Beijing No.2 Intermediate People's Court](Beijing No.2 Interm. People's Ct. Feb. 18, 1997).
ii. Ji Qiang yu Liu Hui Su Chaoyang Xingnuo Jianzhu Gongcheng Youxian Gongsi (季强与刘辉诉朝阳兴诺建筑工程有限公司)[Ji Qiang, Liu Hui v. Chaoyang Xingnuo Constr. Ltd.] (最高人民法院(2008)民三他字第 4 号) [No. 4 (2008) of the Supreme People's Court) (Sup. People's Ct. Jul. 8, 2008).
iii. U.S. FED. TRADE COMM'N, THIRD PARTY UNITED STATES FEDERAL TRADE COMMISSION'S STATEMENT ON THE PUBLIC INTEREST (2012), *available at* https://www.ftc.gov/sites/default/files/documents/advocacy_documents/ftc-comment-united-states-international-trade-commission-concerning-certain-wireless-communication/1206ftcwirelesscom.pdf (last visit date: April 16, 2015).
iv. Microsoft Corp. v. Motorola, Inc., 696 F.3d 872 (9th Cir. Wash. 2012), Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015).
v. U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS (2013).
vi. Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233 (W.D. Wash. Apr. 25, 2013), Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015).
vii. Realtek Semiconductor Corp. v. LSI Corp., 946 F. Supp. 2d 998 (N.D. Cal. 2013).
viii. THE U.S. TRADE REPRESENTATIVE, EXEC. OFFICE OF THE PRESIDENT, DISAPPROVAL OF THE U.S. INTERNATIONAL TRADE COMMISSION'S DETERMINATION IN THE MATTER OF CERTAIN ELECTRONIC DEVICES, INCLUDING WIRELESS COMMUNICATION DEVICES, PORTABLE MUSIC AND DATA PROCESSING DEVICES, AND TABLET COMPUTERS, INVESTIGATION NO. 337-TA-7941 (2013), *available at* https://ustr.gov/sites/default/files/08032013%20Letter_1.PDF (last visit date: April 16, 2015).
ix. In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013).
x. Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013).
xi. Guojia Biaozhun Sheji Zhuanli de Guanli Guiding (国家标准涉及专利的管理规定 (暂行))[Regulatory Measures on National Standards Involving Patents (Interim)] (promulgated by the Standardization Admin. China & St. Intell. Prop. Off., Dec. 19, 2013, effective Jan. 1, 2014), http://www.sipo.gov.cn/zcfg/flfg/zl/bmgfxwj/201401/t20140103_894910.html (China).
xii. Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (最高人民法院(2012)民提字第 125 号) [No. 125 (2012) of the Supreme People's Court] (Sup. People's Ct. Jan. 2, 2014).
xiii. Apple Inc. v. Motorola, Inc., 110 U.S.P.Q.2D 1695 (Fed. Cir. Apr. 25, 2014).
xiv. Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014).
xv. Zuigao Renmin Fayuan Guanyu Shenli Qinfan Zhuanliquan Jiufen Anjian Yingyong Falv Ruogan Wenti de Jieshi Er Zhengqiu Yijian Gao (最高人民法院关于审理侵犯专利权纠纷案件应用法律若干问题的解释(二)(征求意见稿)) [Interpretation of the Supreme People's Court on Several Issues concerning the Application of Law in the Trial of Patent Infringement Dispute Cases (Part Two)(Draft for Asking Comments)], http://www.hfiplaw.cn/?p=2809 (China).
xvi. Zhonghua Renmin Gongheguo Zhuanli Fa Xiuding Caoan Songshen Gao (中华人民共和国专利法修订草案(送审稿)) [Drafted Amendment of Patent Law of People's Republic of China (Draft for Approval)], http://www.chinalaw.gov.cn/article/cazjgg/201512/20151200479591.shtml (China).
xvii. Commonwealth Sci. & Indus. Research Organisation v. Cisco Sys., 809 F.3d 1295 (Fed. Cir. Dec. 3, 2015).

Source: Compiled by the author

In summation, the United States government' current position is generally not to grant injunctive relief and not to calculate damages based on final products. Protections of SEP in the United States appear weak to some extent. In contrast, the Chinese government continues to increase SEP protections, and will render reasonable protections under certain circumstances. Given the economic competition and connection between the United States and China, these two countries are likely to influence each other's positions on SEP protections. The interviews conducted in this research focused on these issues:

- The first is to discuss whether the American government will likely adjust its current tendency of weak SEP protections. The American government appears to treat SEP disputes differently from a normal IP dispute. The protections in SEP cases are not as strong as that in normal IP cases because SEP holders generally cannot obtain injunctive relief and courts tend to render damages based on small components of final products. Strong enforcement of SEPs rewards primary inventors. Conversely though, when the government has strong SEP protections, these protections may cause "hold-up" or "royalty stacking" problem, and even have been criticized as a "patent trap."[1589] They may also impede the diffusion of innovation through commercialization, and may block secondary innovators. The focus of this section will be the likely future direction of US SEP policy in light of these conflicting policy objectives.
- The second is to discuss the future development of SEP protections in the PRC. After joining the WTO, China is harmonizing its IP systems with the global IP systems. As it transforms the Chinese industry to comply with international standards, some of China's domestic corporations grow in innovation and some have requested more IP protections.[1590] This changing economic environment has led the government to reform its laws in IP protections. However, because foreign corporations still possess a majority of SEPs, strong SEP protections may only harm China's growing industry and growing corporations. The Chinese government and society also tend to regard technology standards as public goods because the government has led most of the standard-setting activities. This section will also discuss whether the Chinese government islikely to change its current trend of increasing SEP protections.

2. Possible Future Directions

a The United States Will Likely Continue Its Not-strong Protection of SEPs

Some American scholars mentioned in interviews that SEP protections, particularly damage calculations, are not entirely weak in the United States.[1591] The recent *Microsoft v. Motorola* and *In re Innovatio* represent progress in clarifying the framework within which SEP damages can be calculated.[1592] This framework does not mandate that SEP holders will always get low royalties as a result.[1593] When patentees have many SEPs incorporated into technology standards or technology standards that cover just a few SEPs, the patentees can still obtain high royalties as rewards.[1594] These recent cases merely remind the court to consider "whole SEPs" in the technology standards, instead of just focusing on certain SEPs at issue.[1595] This approach applies a cleaner method in handling patent damage disputes.[1596] Despite this, it remains controversial whether the SSPPU method is the most suitable one for calculating SEP damages.[1597] The forthcoming decision in *Ericsson v. D-link* and other court decisions may shed more light on to how the courts will ultimately calculate SEP damages. The decision in that case may ultimately help discern whether SEP protections are truly weaker in the United States now than they were in the past.

[1589] *See* Chapters 1 and 2 for further discussion regarding hold-up, royalty stacking and patent trap.
[1590] Wang Bin, Director, Huawei Tech., Address at the International Symposium on Legal Reforms in Standard Essential Patents Context (Nov. 18, 2015).
[1591] Interview with USUNI-3, 2016, interview with USUNI-4, 2016, interview with USUNI-2, 2016.
[1592] Interview with USUNI-3, 2016.
[1593] Interview with USUNI-3, 2016.
[1594] Interview with USUNI-3, 2016.
[1595] Interview with USUNI-4, 2016.
[1596] Interview with USUNI-4, 2016.
[1597] Interview with USUNI-2, 2016.

Most interviewees concurred that current SEP protections in the United States are not as strong as patent holders once hoped or as strong as patent protections outside the SEP context.[1598] In its history of patents, the American government has been evolved over time with regard to certain issues of patent protection.[1599] One such example was the injunction issue addressed before and after the *eBay* case.[1600] This evolving policy was similarly seen in the treatment of SEPs.[1601] Now, the government is moving towards low SEP protections and does not appear likely to return to stronger protections.[1602] For example, the Federal Circuit held that it will not grant injunctions in *Apple v. Motorola*.[1603] In terms of contracts, this bar on injunctions is logical as patentees have already made FRAND commitments to SSOs.[1604] Although some corporations may be unhappy with the lack of injunctive relief, most corporations find this lack of relief acceptable.[1605]

The telecommunications industry has experienced the most serious disputes regarding SEPs and has seen the most problems with hold-ups.[1606] The decreasing SEP protections in recent decisions may have a limited impact on industry development as a whole, because the impact only occurs in certain industries.[1607] In both telecommunications and the pharmaceutical industry, patents are often considered as final products for sale.[1608] Because of this, for the level of protection for SEPs is likely to be extremely controversial.[1609] In other industries, such as software, computer devices, and information technology industries, the problem may not be so serious.[1610] One of the reasons for this is that these industries have real products for sale, instead of patents alone.[1611] The other reason is that SEPs in these industries are possessed by many corporations instead of being monopolized by certain corporations.[1612] These SEPS held by multiple corporations can thus counter against each other, and the industry will not be dominated or controlled by a limited number of corporations only.[1613] Some corporations may criticize that the current SEP decisions are favorable to patentees and industry development, but the fact is that this only applies to certain industries.[1614] Other major industries may not confront this kind of problem.[1615]

[1598] Interview with USUNI-3, 2016, interview with USUNI-2, 2016, interview with USCOM-2, 2016, interview with USCOM-1, 2016, interview with USCOM-3, 2016, interview with USASS-2, 2016.
[1599] Interview with USCOM-1, 2016.
[1600] Interview with USCOM-1, 2016.
[1601] Interview with USCOM-1, 2016.
[1602] Interview with USCOM-1, 2016, interview with USCOM-3, 2016.
[1603] Interview with USUNI-3, 2016, interview with USUNI-2, 2016.
[1604] Interview with USUNI-3, 2016.
[1605] Interview with USUNI-3, 2016.
[1606] Interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USASS-2, 2016. *See also* YANRUI WU, CHINA'S ECONOMIC GROWTH: A MIRACLE WITH CHINESE CHARACTERISTICS (2004), ERIC HARWIT, CHINA'S TELECOMMUNICATIONS REVOLUTION (2008).
[1607] Interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USASS-2, 2016.
[1608] Interview with USCOM-3, 2016.
[1609] Interview with USCOM-3, 2016.
[1610] Interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USASS-2, 2016.
[1611] Interview with USCOM-2, 2016, interview with USCOM-3, 2016.
[1612] Interview with USCOM-2, 2016.
[1613] Interview with USCOM-2, 2016. *See also* Jonas Hein, *The Recent DOJ and FTC Policy Suggestions for Standard Setting Organizations- The Way out of Standard-essential Patent Hold-up?* 2(2) J. INTELL. PROP. & ENT. L. 339 (2013), Mark A. Lemley & Carl Shapiro, *Patent Hold-up and Royalty Stacking*, 85 TEX. L. REV. 1991 (2007), Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 INNOVATION POL'Y & THE ECON. 119 (2001).
[1614] Interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USASS-2, 2016.
[1615] Interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USASS-2, 2016.

Moreover, strong SEP protections may tend to discriminate against small corporations, which may create barriers to technology innovation and industry development.[1616] If large corporations can easily obtain injunctive relief and higher reward royalties, they may be likely to vigorously exploit their SEPs, limiting grassroots development with smaller corporations.[1617] Small corporations may not be able to afford to compete with SEPs and may be unable to bear the transaction costs imposed by strong SEP enforcement, even though they may have more innovative ideas and technology.[1618] If this discrimination happens, technology development will mostly be dominated by large corporations and the industry benefit less from market innovation by small corporations. Therefore, avoiding strong SEP protections may contribute to an industrial environment with lower transaction costs as well as greater transparency and openness.[1619]

Even though the current SEP protections are decreasing, this situation is unlikely to affect standardization development greatly.[1620] For most corporations, joining standard-setting activities is not merely for the purpose of incorporating patents into standards.[1621] Despite making injunctions harder to obtain and lowering damage awards in recent SEP decisions, corporations may not be deterred from joining standard-setting activities or proposing innovative technological ideas.[1622]

Although current SEP protections may be considered fairly weak by some observers, the American government will continue protecting SEPs in light of the existing case laws, there is no reason to believe that the US would ever adopt a policy of abandoning protections of SEPs altogether.[1623] The existing decisions in court have indicated clear rationales and infrastructure regarding SEP remedies.[1624] The royalties of SEP can then be estimated with greater ease and precision.[1625] As a result, patent pools, SEP holders, and standard implementers can decide the price of SEPs in private, instead of relying on courts to issue a decision on the matter.[1626] Because the process of determining the SEP price in private is likely to be fully debated and discussed, this will make transactions in the market far more transparent.[1627] This transparency is beneficial not only for SEP holders in distributing their SEPs, but also for standard implementers who obtain complete information and can save on transaction costs.

Compared to the antitrust and injunction issues which appear to have been resolved with some certainty, the issue of how to calculate damages for infringement of SEPs remains more uncertain. The courts have yet to determine whether the SSPPU method is the standard means of determining

[1616] Interview with USASS-2, 2016.
[1617] Interview with USASS-2, 2016, interview with CNGOV-4, 2016.
[1618] Interview with USASS-2, 2016, interview with CNGOV-4, 2016.
[1619] Interview with USASS-2, 2016.
[1620] Interview with USCOM-2, 2016, interview with USCOM-3, 2016, interview with USCOM-1, 2016. Only certain corporations (e.g. Qualcomm) argue the opposite, saying that low SEP protections will decrease incentives for corporations to propose innovative technology in standard-setting activities and thereby restrict standardization development. However most corporations would disagree with this argument. Interview with USCOM-3, 2016.
[1621] Interview with USCOM-1, 2016.
[1622] Interview with USCOM-1, 2016.
[1623] Interview with USCOM-3, 2016.
[1624] Interview with USUNI-3, 2016, interview with USCOM-3, 2016.
[1625] Interview with USUNI-3, 2016.
[1626] Interview with USUNI-3, 2016.
[1627] Interview with USUNI-3, 2016.

reasonable royalties for SEPs.[1628] The protections of SEP may as a result grow stronger in the United States if the court renders higher damages in the future. However, it is unlikely that the court will change to adopt stronger SEP protections, because future industry development has been focusing on the Internet and software industries.[1629] If IP or SEPs continue to be an issue of great debate, this situation is not helpful to software and Internet industries.[1630] "Open standards" and "open source" will likely become another primary and significant issue in technology standards in the future.[1631] Given these considerations necessary for future industry development, it is unlikely that SEP protections will grow stronger than they are currently in the United States.

b China Will Likely Increase Its SEP Protections

It is without a doubt that IP protections in China today have strengthened significantly from that of the past. As China's connection with global commerce continues to increase, China will inevitably comply with the global rule, including its IP policies.[1632] Given these growing ties, China will be expected to harmonize its IP systems with the global IP systems in the future.[1633] The following examples demonstrate how China operates its current IP systems and enforcement:

- The Chinese government recently established IP courts in Beijing, Shanghai, and Shenzhen cities in order to increase the quality of court decisions on IP-related issues.[1634]
- The level of damages awarded for IP infringement by Chinese courts also appears to be rising. In examining recent decisions from Beijing courts, the damages awarded appear to have increased.[1635] If an attorney can demonstrate damage by means of reasonable royalties, the courts will issue more compensation for patentees and will not simply refer to the statutory damage provision in the current statute.[1636]

In addition, some Chinese enterprises have recognized the importance of IP.[1637] Tencent and Huawei are good examples of this growing understanding of IP.[1638] In the past, Tencent did not emphasize copyright protections, but it is now asking the Chinese government to provide stronger copyright protections.[1639] Huawei has also asked the Chinese government to increase protections and enforcement of patent rights.[1640] Huawei has also objected to the Chinese government's excessive restrictions on exclusive rights for patents, such as the restriction on injunctive relief.[1641] Today, Huawei has performed well in the realm of patents and has become competitive in the global market.[1642] Huawei's patent performance and progress will be apparent in the 5G

[1628] Interview with USUNI-2, 2016.
[1629] Interview with CNGOV-2, 2015, interview with CNUNI-6, 2015.
[1630] Interview with CNGOV-2, 2015.
[1631] Interview with CNUNI-6, 2015, interview with USASS-2, 2016.
[1632] Interview with CNUNI-5, 2015.
[1633] Interview with TWUNI-3, 2016.
[1634] Interview with TWUNI-3, 2016.
[1635] Interview with CNUNI-4, 2015.
[1636] Interview with CNUNI-4, 2015.
[1637] Interview with TWUNI-3, 2016, interview with CNUNI-1, 2015.
[1638] Interview with CNUNI-1, 2015.
[1639] Interview with CNUNI-1, 2015.
[1640] Interview with CNUNI-1, 2015, Wang Bin, Director, Huawei Tech., Address at the International Symposium on Legal Reforms in Standard Essential Patents Context (Nov. 18, 2015).
[1641] Interview with CNUNI-1, 2015, interview with CNCOM-1, 2015, Wang Bin, Director, Huawei Tech., Address at the International Symposium on Legal Reforms in Standard Essential Patents Context (Nov. 18, 2015).
[1642] Interview with CNUNI-5, 2015, interview with USUNI-5, 2016.

telecommunication industry while it may not be so apparent in the 4G era.[1643] Huawei's success in global competition will encourage other Chinese enterprises to recognize the importance of IP.[1644]

As more Chinese enterprises compete successfully in global markets, its IP systems and enforcement will mature. However, this will be contingent on upgrades within the industry development.[1645] In the past, most Chinese enterprises were not innovative and were not concerned about whether the government should have strong IP protections.[1646] But now, as times have changed, China has gained a number enteprises with a business model that uses innovation as a basis for competition.[1647] These enterprises have begun to ask the government for stronger IP protections.[1648] If the government offers strong IP protections, this serves as a strong incentive for enterprises to create new innovations.[1649]

Despite the increased commitment to harmonize with the global IP systems, China's current IP systems remain incomplete.[1650] Due to a lack of innovative capacity in many Chinese enterprises and industries, it will take China at least 10 or 15 years before its IP systems mature.[1651] In addition, despite the recently strengthened commitment to IP enforcement, it remains unclear how the Chinese government plans to handle new cases and problems arising in SEPs. Recent examples include the pending *Huawei v. InterDigital* in the SPC, as well as other proposed judicial interpretations and patent law reform.

- *Huawei v. InterDigital* has been pending before the SPC for at least two years. The SPC has participated in numerous conferences to gain additional knowledge.[1652] The Justices have also referred to scholarship on this issue to guide its decision.[1653] But it is unclear how the court will solve the issue of reasonable royalties. Some people have criticized that 0.019% as too low of a royalty rate.[1654] These critics consider Huawei not as innovative as Apple, so the court should not apply the same royalty rate to two different licensees.[1655] In contrast, some critics still believe that the royalty rate is too high.[1656] InterDigital did not profit much in the Chinese domestic market, whereas the 0.019% royalty rate was reached based on the global market.[1657] Because of this, the resulting royalty rate should have been much lower than 0.019%.[1658] In addition, if the court finds that InterDigital acted in bad-faith by leveraging its business, the final royalty rate may also be lower than 0.019%.[1659]

[1643] Interview with USUNI-5, 2016.
[1644] Interview with CNUNI-5, 2015.
[1645] Interview with USUNI-3, 2016.
[1646] Interview with CNUNI-6, 2015.
[1647] Interview with USUNI-3, 2016, interview with CNUNI-6, 2015.
[1648] Interview with CNUNI-6, 2015.
[1649] Interview with USUNI-3, 2016.
[1650] Interview with USUNI-3, 2016.
[1651] Interview with USUNI-3, 2016.
[1652] Interview with CNCOM-1, 2015.
[1653] Interview with CNCOM-1, 2015.
[1654] Interview with TWUNI-1, 2015.
[1655] Interview with TWUNI-1, 2015.
[1656] Interview with CNUNI-8, 2016.
[1657] Interview with CNUNI-8, 2016.
[1658] Interview with CNUNI-8, 2016.
[1659] Interview with CNUNI-8, 2016.

- As for the recently proposed judicial interpretation and *Patent Law* reform, many have objected to its content, particularly the duty to disclose SEPs.[1660] This requirement to disclose seems impractical in China.[1661] Approximately ten years ago, when the government was still setting technology standards in the MIIT, the government required Chinese enterprises to disclose their SEPs.[1662] These domestic enterprises responded negatively to this requirement.[1663] However, with these firms' growing influence today, the disclosure requirement in the recently proposed rules may no longer be sustainable. It is also questionable whether the Chinese government has the competence to distinguish the essentiality of patents.[1664] Even if it did, it is unclear whether the government should invest such immense resources into examining the essentiality.[1665]

China's SEP or IP protections have improved significantly from that of the past, and the protections will grow in the long term.[1666] These more comprehensive protections will likely occur when China upgrades its domestic industry and Chinese domestic enterprises become innovative.[1667] However, in the short term, it is unclear how the protections will develop during the transition period from the existing system to a new one. In light of the recently proposed judicial interpretation and patent law reform, the government is likely to provide "conditional" protections to SEP holders. The Chinese government will only completely protect SEPs under specific conditions. These conditions include: fully disclosing SEPs, complying with the FRAND commitment, and acting in good-faith. In the future when the Chinese industry is upgraded and innovated, the Chinese will not have these conditions or restrictions any more.

V. Conclusion

This dissertation discusses the regulatory competition between the United States and China in the fields of standardization and SEP protections. To discuss these two nations' future possible regulatory change, the dissertation conducted interviews with experts in the United States, China, and Taiwan. The interviewees were from high-tech corporations, government agencies, research institutes, universities, industrial associations, etc. This chapter draws the following conclusions in light the interviews

- Changing Chinese Standardization System

In terms of the standardization system, the United States is likely to retain its bottom-up system; China is likely to make modest changes its top-down system slowly and with many limitations. Standard-setting activities developed in the United States evolved slowly in response to changing social and economic conditions, and now are deeply embedded into the fabric of American economic and legal institutions. The American private sector has significant experience and competence in standard-setting activities in the American market. As seen in the CDMA 2000

[1660] Interview with USCOM-2, 2016, interview with CNUNI-1, 2015.
[1661] Interview with USCOM-2, 2016, interview with CNGOV-4, 2016.
[1662] Interview with CNGOV-4, 2016.
[1663] Interview with CNGOV-4, 2016.
[1664] Interview with USCOM-2, 2016.
[1665] Interview with USCOM-2, 2016.
[1666] Interview with USUNI-3, 2016.
[1667] Interview with USUNI-3, 2016.

standard, the American industry benefited from a market-driven system that adapts to new changes in technology and the industry.

As for China, its domestic market is moving towards a market economy, and some Chinese corporations are growing in innovative capacity. The Chinese industry is gradually moving up the global value chain. As seen in the TD-SCDMA standard, it is not in China's best interests to isolate itself from global commerce. China is also gradually upgrading its technological industry and the framework within which Chinese domestic enterprises and foreign enterprises interact is evolving. These two factors are helping China move its standardization system in the direction of bottom-up model. The transformation not only helps China's standardization development obtain more ideas from the market, but also affords the private sector more grounds for participation and incentives in the standard-setting process.

Despite the positive momentum to change with the times, China's standardization development will continue to feel the influence of a HYBRID MARKET/SOCIALIST economy. Given the current shift toward stronger central control and stronger leadership from the Chinese Communist Party since President Xi Jinping came to power in 2013, it is unlikely that the Chinese government will allow the market to lead standard-setting activities entirely. Therefore, the transformation in its standardization system will be limited and is likely only to see changes emerge in certain fields. Based on this history and their current trends, the United States will not change its voluntary standardization system, while China will change its hierarchical standardization system towards a looser model, though with some limitations.

- Changing Chinese Antitrust Intervention in SEPs

With regard to antitrust intervention in SEPs, the United States is likely to retain its hands-off approach, while China is likely to limit its strong interventions to some extent. In the current American market, the less the government intervenes, the better. Holders of SEPs may exercise their exclusive rights in the market, with fewer antitrust agencies intervention. Considering that this position has formed for a period of time and has been confirmed in court decisions, it is unlikely that any changes will take place in a short time. Regarding the application of antitrust law to SEPs as a private dispute and not a public dispute may permit the issues to be explored more fully. These discussions and debates could contribute to transparency and promote competition.

As for China, PRC antitrust agencies seem to be softening their tendency to use antitrust regulations to restrict SEP's exclusive rights. The antitrust agencies started with the perspective that SEP exclusive rights are monopoly rights. These agencies are now slowly accepting the idea that SEP protection is also important to facilitate innovation. While balancing the market order and innovation protection, these agencies are reducing antitrust interventions in the market to the extent they can. The looser intervention helps private enterprises compete and innovate in the market. However, given past Chinese traditions, it is unlikely that the government will be entirely hands-off and let the market lead. Because the government is likely to continue mistrusting the market and the business world, China may loosen some of its antitrust interventions but with some limitations.

- Changing American and Chinese Remedies in SEP

While the overall structure of the standardization systems and antitrust interventions in the U.S. and China appear to be reasonably stable, the framework within which damages for SEP

infringement are calculated appears to be evolving in both American and PRC jurisdictions. The United States recently began limiting the use of injunctions for patent infringement and tends to award low damages for SEP holders. This recent trend differs from the past in which the United States granted injunctions and awarded high amounts for compensation as remedies. China on the other hand has shown a reverse trend, where the government has been increasing SEP protections. The government has been awarding reasonable SEP protections in certain circumstances.

Even though U.S. Law with respect to the remedies awarded for SEP infringement, there is no reason to believe that this change was a result of the competition between the United States and China as opposed to a result of the normal evolution of legal doctrine within the U.S. domestic legal system. Rather, given the changes in the American domestic industry, a more likely cause for this shift is the change in internal dynamics of the industry. The United States' domestic industry is shifting towards the Internet and software industry, where an over emphasis on SEP protections may tend to stifle industry development. In addition, the American government prefers not to intervene in the voluntary standardization process and avoids restricting SEPs' exclusive rights by means of antitrust. Given this situation, SEP remedy awards seem to be the only regulatory approach left to govern standard-setting issues. Even though the standards for SEP remedy awards remain controversial and have not been completely settled in the United States, the changes seen as of late still reflects a basis in precedent and should not exceed these settled rules to a certain extent.

On the other hand, China's framework for granting remedies for infringement of SEPs appears to have been influenced by the United States as well as by internal domestic developments. As China's domestic industry grows in innovative capacity, the industry recognizes the growing importance of IP protections. Some Chinese competitive corporations are now asking the PRC government to protect innovations. These innovation protections will only increase as the Chinese industry continues to grow and upgrade itself. Even though the government can only afford conditional SEP protections today, these protections will increase in the future as the Chinese industry's innovative capacity and competitive nature improve.

Chapter 8 Conclusion

This dissertation focused on standard essential patents ("SEPs") and analyzed the interaction and influence of Sino-American competition on SEP regulations. The dissertation examines SEP regulatory competition based on two important questions:

(1) As China's level of economic development rises, will China's SEP policies converge with or diverge from Western SEP policies?

(2) What impact, if any, will China's SEP policies have on American SEP policies?

Composed of eight chapters, the dissertation discusses these questions by looking at the two nations' standardization regulations (Chapters 3 and 4), SEP regulations (Chapters 5 and 6), and their interaction with one another and possible changes in the future (Chapter 7).

Chapter 2 introduced some fundamental concepts related to the study of business and legal issues relevant to technology standards. Chapter 3 reviewed the United States' system of voluntary standardization. The United States has a long history of market-led standard-setting activities that reflects American culture and traditions, including a history of government mistrust. After the 1980s, Congress established legislation reinforcing the role of voluntary, consensus standard setting processes based in private sector standard-setting organizations ("SSOs"). In the American market, the government rarely interferes with voluntary, consensus standard-setting and only in a limited capacity. There are hundreds of officially recognized SSOs in the United States and thousands of informal ones, demonstrating a mature mechanism and flourishing atmosphere for standardization development. As illustrated in the case study of the CDMA 2000 telecommunication standard, this standardization system helped the United States meet the needs of a rapidly-changing technological industry.

Chapter 4 introduced China's centralized and hierarchical standardization system. Developed during China's period of a planned economy, this system continued to influence China's standardization even though the government began to include voluntary standards after the 1980s. China used standardization as a tool to develop its domestic economy and protect local enterprises, establishing legislation to support state-led and top-down standardization development. In the Chinese market, the government assumes the primary responsibility in standardization development. The central government and local governments administer, formulate, and research standards. Although China's standardization system may appear to be efficient, it is based on a limited knowledge of the market, so as the market economy grows in China, it is increasingly unresponsive to the needs of China's consumers and businesses. The case study of the TD-SCDMA telecommunication standard demonstrates problems within China's current standardization system. China's recent reform in standardization aims to solve these problems by simplifying the standardization process and increasing access to market innovation.

Chapter 5 discusses SEP regulations in the United States with regard to antitrust interventions and patent remedies. These SEP disputes first emerged as a public antitrust issue as early as 1996. The government began with strict and active enforcement, but then later adopted a more tolerant stance that eventually became a hands-off approach to the matter. After the government stopped intervening in SEP issues through antitrust regulations, SEP issues were reframed as a private patent remedies issue post-2010. Today, the United States no longer clearly favors granting

injunctive relief for patent infringement generally and disfavors infringements for infringement of SEPs. The issue of reasonable royalties remains a hotly debated issue with the public and has not yet been settled in the courts. Despite the ongoing debate, current court decisions have established a clear infrastructure to calculate and predict what reasonable royalties for SEPs are.

Chapter 6 discussed SEP regulations in China. SEP disputes first emerged in China as a private patent remedies issue in 1997. Due to an incomplete patent system, SEP protections were nonexistent, with no judicial relief available. This system later developed slightly, offering strictly restricted protections, and finally became reasonable protections. Today, China has developed a rough model for different scenarios and how to treat SEP remedies. Chinese courts grant conditional protections for SEPs and take into account the standard's nature, SEP disclosure, and license commitment. In 2008, China's new Antimonopoly Law went into effect, so antitrust issues in SEPs received more attention since then. In light of the current decisions and regulations, the Chinese government has a strong tendency to address SEP problems through active and strict antitrust interventions.

Chapter 7 discusses the interactions between the United States and China's SEP policies and the possible future evolution of these systems. Interviews conducted with a diverse array of experts in different regions explored global harmonization or fragmentation between these two nations' SEP policies in the future.

- In terms of standardization regulations, the United States is likely to retain its bottom-up system which is deeply embedded in its economic and social institutions. China is likely to transform its top-down system, but the transformation will be subject to certain limitations due to the influence of a hybrid socialist/market economy.
- Regarding antitrust interventions in SEPs, the United States is likely to retain its hands-off approach and avoid intervening in the market as much as possible, which is similar with its approach to standard-setting regulations. China is likely to decrease its strong antitrust interventions, but likewise this reduction will be implemented with some limitations due to the influence of a planned economy.
- Unlike the standardization and antitrust regulations mentioned above, SEP remedy awards are changing in both the United States and China. The United States may potentially decrease its SEP remedies due to internal industry dynamics. This reduction of protections will have certain limitations due to case law in American courts. In contrast, China will likely increase its SEP remedies as a result of its competition with the United States. As China's growing domestic industry demands more protections for innovation, China will likely adopt more protections; how far these protections will go depends on future developments in the Chinese industry.

As China continues to increase its level of development, China's SEP policy will probably continue to converge with Western SEP policies. This can be seen in China's standardization development, antitrust intervention, and patent remedies as discussed in this dissertation. Despite the gradual convergence with Western standards, Chinese SEP policies will diverge in the long run due to the historical influence of being a planned economy and the current influence of Socialism with Chinese Characteristics.

Unless China's economy overtakes that of the United States, it seems unlikely that China's SEP policy will have much impact on American SEP policies. Even though the award of SEP remedies in

the United States is likely to decrease, this change is more likely to be caused by changes in its internal industry dynamics and will be limited by its case law. The change is not likely to be due to United States-China competition in the market. Consequently, this dissertation concludes that China will likely continue to be more influenced by its competition with the United States, whereas the United States is unlikely to be influenced by its competition with China. Even as China's share of the world economy continues to increase, its Socialism with Chinese Characteristics is unlikely to provide a model for law reform in other countries. As the leading liberal market economy in the world, American law reform strategies are likely to remain models for other countries seeking to strengthen their market institutions.

Bibliography

I. English Documents

A. Books

1. AM. BAR ASS'N, HANDBOOK ON THE ANTITRUST ASPECTS OF STANDARD SETTING (2d ed. 2011).
2. ANDERMAN, STEVEN & EZRACHI, ARIEL, INTELLECTUAL PROPERTY AND COMPETITION LAW (2011).
3. ADELMAN, MARTIN J., RADER, RANDALL R. & THOMAS, JOHN R., CASES AND MATERIALS ON PATENT LAW (3d ed. 2009).
4. AYRES, IAN & BRAITHWAITE, JOHN, RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATIONS DEBATE (1992).
5. BALDWIN, ROBERT, CAVE, MARTIN & LODGE, MARTIN, UNDERSTANDING REGULATION: THEORY, STRATEGY, AND PRACTICE (2d ed. 2012).
6. BONFIELD, LLOYD, AMERICAN LAW AND THE AMERICAN LEGAL SYSTEM IN A NUTSHELL (2006).
7. BREYER, STEPHEN G., REGULATION AND ITS REFORM (1982).
8. CHISUM, DONALD S., CHISUM ON PATENTS 7 (2013).
9. CHEN, ALBERT HUNG-YEE, AN INTRODUCTION TO THE LEGAL SYSTEM OF THE PEOPLE'S REPUBLIC OF CHINA (4th ed. 2011).
10. CARRIER, MICHAEL A., INNOVATION FOR THE 21ST CENTURY: HARNESSING THE POWER OF INTELLECTUAL PROPERTY AND ANTITRUST LAW (2009).
11. CONTRERAS, JORGE L. & AM. BAR ASS'N, STANDARDS DEVELOPMENT PATENT POLICY MANUAL (2007).
12. CHANG, HA-JOON, KICKING AWAY THE LADDER: DEVELOPMENT STRATEGY IN HISTORICAL PERSPECTIVE (2002).
13. COWEN, TYLER, PUBLIC GOODS AND MARKET FAILURES: A CRITICAL EXAMINATION (1991).
14. CARGILL, CARL F., OPEN SYSTEMS STANDARDIZATION: A BUSINESS APPROACH (1997).
15. CHEIT, ROSS E., SETTING SAFETY STANDARDS: REGULATION IN THE PUBLIC AND PRIVATE SECTORS (1990).
16. COCHRANE, REXMOND C., MEASURES FOR PROGRESS: A HISTORY OF THE NATIONAL BUREAU OF STANDARDS (1966).
17. DURHAM, ALAN L., PATENT LAW ESSENTIALS: A CONCISE GUIDE (4th ed. 2013).
18. DOWDLE, MICHAEL W., JOHN GILLESPIE, & IMELDA MAHER, ASIAN CAPITALISM AND THE REGULATION OF COMPETITION: TOWARDS A REGULATORY GEOGRAPHY OF GLOBAL COMPETITION LAW (2013).
19. DUDLEY, SUSAN E. & BRITO, JERRY, REGULATION: A PRIMER (2d ed. 2012).
20. ERNST, DIETER, AMERICA'S VOLUNTARY STANDARDS SYSTEM: A 'BEST PRACTICE' MODEL FOR ASIAN INNOVATION POLICIES? (2013).
21. ERNST, DIETER, INDIGENOUS INNOVATION AND GLOBALIZATION: THE CHALLENGE FOR CHINA'S STANDARDIZATION STRATEGY (2011).
22. EVANS, DAVID S., HAGIU, ANDREI & SCHMALENSEE, RICHARD, INVISIBLE ENGINES: HOW SOFTWARE PLATFORMS DRIVE INNOVATION AND TRANSFORM INDUSTRIES (2008).
23. FOX, ELEANOR M., CASES AND MATERIALS ON U.S. ANTITRUST IN GLOBAL CONTEXT (3d ed 2012).
24. FREIBERG, ARIE, THE TOOLS OF REGULATION (2010).
25. FUNK, JEFFREY L., GLOBAL COMPETITION BETWEEN AND WITHIN STANDARDS: THE CASE OF MOBILE PHONES (2001).
26. GARNER, BRYAN A., BLACK'S LAW DICTIONARY (10th ed. 2014).
27. GAO, YUNING, CHINA AS THE WORKSHOP OF THE WORLD: AN ANALYSIS AT THE NATIONAL AND INDUSTRIAL LEVEL OF CHINA IN THE INTERNATIONAL DIVISION OF LABOR (2012).
28. GARNER, BRYAN A., GARNER'S DICTIONARY OF LEGAL USAGE (3d ed 2011).
29. HOVENKAMP, HERBERT, JANIS, MARK D., LEMLEY, MARK A. & LESLIE, CHRISTOPHER R., IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW 2 (2010).
30. HARWIT, ERIC, CHINA'S TELECOMMUNICATIONS REVOLUTION (2008).

31. HUANG, YASHENG, CAPITALISM WITH CHINESE CHARACTERISTICS: ENTREPRENEURSHIP AND THE STATE (2008).
32. HALL, PETER A. & SOSKICE, DAVID, VARIETIES OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE (2001).
33. JAKOBS, KAI, INFORMATION TECHNOLOGY STANDARDS AND STANDARDIZATION : A GLOBAL PERSPECTIVE (2000).
34. KORHONEN, JUHA, INTRODUCTION TO 4G MOBILE COMMUNICATIONS (2014).
35. KENNEDY, SCOTT, BEYOND THE MIDDLE KINGDOM: COMPARATIVE PERSPECTIVES ON CHINA'S CAPITALIST TRANSFORMATION (2011).
36. KIRTON, JOHN J. & TREBILCOCK, MICHAEL J., HARD CHOICE, SOFT LAW: VOLUNTARY STANDARDS IN GLOBAL TRADE, ENVIRONMENT AND SOCIAL GDOVERNANCE (2004).
37. KRISLOV, SAMUEL, HOW NATIONS CHOOSE PRODUCT STANDARDS AND STANDARDS CHANGE NATIONS (1997).
38. LARDY, NICHOLAS R., MARKETS OVER MAO: THE RISE OF PRIVATE BUSINESS IN CHINA (2014).
39. LUNDQVIST, BJÖRN, STANDARDIZATION UNDER EU COMPETITION RULES AND US ANTITRUST LAWS - THE RISE AND LIMITS OF SELF-REGULATION (2014).
40. MAZZUCATO, MARIANA, THE ENTREPRENEURIAL STATE: DEBUNKING PUBLIC VS. PRIVATE MYTHS IN RISK AND INNOVATION (2013).
41. MUELLER, MILTON L., NETWORKS AND STATES: THE GLOBAL POLITICS OF INTERNET GOVERNANCE (1st 2013).
42. MUELLER, JANICE M., PATENT LAW (4th ed. 2012).
43. MERGES, ROBERT P., MENELL, PETER S. & LEMLEY, MARK A., INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE (5th ed. 2009).
44. MUELLER, JANICE M., AN INTRODUCTION TO PATENT LAW (3d ed 2009).
45. MURPHY, CRAIG N. & YATES, JOANNE , THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO): GLOBAL GOVERNANCE THROUGH VOLUNTARY CONSENSUS (1st 2009).
46. MURPHY, DALE D., THE STRUCTURE OF REGULATORY COMPETITION: CORPORATIONS AND PUBLIC POLICIES IN A GLOBAL ECONOMY (2004).
47. MASKUS, KEITH E., INTELLECTUAL PROPERTY RIGHTS IN THE GLOBAL ECONOMY (2000).
48. MOWERY, DAVID C. & NELSON, RICHARD R., SOURCES OF INDUSTRIAL LEADERSHIP: STUDIES OF SEVEN INDUSTRIES (1999).
49. NAUGHTON, BARRY J., THE CHINESE ECONOMY: TRANSITIONS AND GROWTH (2007).
50. OGUS, ANTHONY I., REGULATION: LEGAL FORM AND ECONOMIC THEORY (2004).
51. PRESSMAN, DAVID, PATENT IT YOURSELF: YOUR STEP-BY-STEP GUIDE TO FILING AT THE U.S. PATENT OFFICE (15th ed. 2011).
52. POTTER, PITMAN B., CHINA'S LEGAL SYSTEM (2013).
53. POTTER, PITMAN B., THE CHINESE LEGAL SYSTEM: GLOBALIZATION AND LOCAL LEGAL CULTURE (2001).
54. RUSSELL, ANDREW L., OPEN STANDARDS AND THE DIGITAL AGE: HISTORY, IDEOLOGY, AND NETWORKS (2014).
55. SAGERS, CHRISTOPHER L., EXAMPLES AND EXPLANATIONS: ANTITRUST (2d ed. 2014).
56. SAICH, TONY, GOVERNANCE AND POLITICS OF CHINA (3d ed. 2011).
57. SCHECHTER, ROGER E. & THOMAS, JOHN R., PRINCIPLES OF PATENT LAW (2004).
58. SALAMON, LESTER M., THE TOOLS OF GOVERNMENT: A GUIDE TO THE NEW GOVERNANCE (2002).
59. SCHOOLEY, JAMES F., RESPONDING TO NATIONAL NEEDS: THE NATIONAL BUREAU OF STANDARDS BECOMES THE NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY (2000).
60. SCHMIDT, SUSANNE K. & WERLE, RAYMUND, COORDINATING TECHNOLOGY: STUDIES IN THE INTERNATIONAL STANDARDIZATION OF TELECOMMUNICATIONS (1998).
61. SHAPIRO, CARL & VARIAN, HAL R., INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY (1998).
62. SCHERER, FREDERIC M., ECONOMIC EFFECTS OF COMPULSORY PATENT LICENSING (1977).

63. TELYAS, DAVID, THE INTERFACE BETWEEN COMPETITION LAW, PATENTS AND TECHNICAL STANDARDS (2014).
64. U.S. CONG., GLOBAL STANDARDS: BUILDING BLOCKS FOR THE FUTURE (1992).
65. WU, JINGLIAN, UNDERSTANDING AND INTERPRETING CHINESE ECONOMIC REFORM (2005).
66. WU, YANRUI, CHINA'S ECONOMIC GROWTH: A MIRACLE WITH CHINESE CHARACTERISTICS (2004).
67. WILSON, KEVIN G., DEREGULATING TELECOMMUNICATIONS: U.S. AND CANADIAN TELECOMMUNICATIONS, 1840-1997 (2000).
68. YOUNGS, GILLIAN, DIGITAL WORLD: CONNECTIVITY, CREATIVITY AND RIGHTS (2013).
69. YANG, DALI L., REMAKING THE CHINESE LEVIATHAN: MARKET TRANSITION AND THE POLITICS OF GOVERNANCE IN CHINA (2004).
70. ZIMMERMAN, JAMES M., CHINA LAW DESKBOOK: A LEGAL GUIDE FOR FOREIGN-INVESTED ENTERPRISES (4th ed. 2014).
71. ZHANG, CHU & XU, XINGXIANG, CHINA PATENT LEGAL SYSTEM AND PRACTICE (2010).
72. ZHANG, JIANJUN, MARKETIZATION AND DEMOCRACY IN CHINA (2008).

B. Collections

1. Brandt, Loren & Rawski, Thomas G., *China's Great Economic Transformation, in* CHINA'S GREAT ECONOMIC TRANSFORMATION 1 (Brandt, Loren & Rawski, Thomas G. ed., 2008).
2. Carl Cargill, *The Role of Consortia Standards in Federal Government Procurements, in* THE STANDARDS EDGE 389 (Bolin, Sherrie ed., 2002).
3. Grossman, Barry L., *Chapter 31. Patent Infringement Damages*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 1403 (Grossman, Barry L. & Hoffman, Gary M. ed., 2010).
4. Gibson, Christopher S., *Technology Standards – New Technical Barriers to Trade? in* THE STANDARDS EDGE: THE GOLDEN MEAN 45 (Bolin, Sherrie ed., 2007).
5. Garcia, D. Linda, Leickly, Bethany L. & Willey, Scott, *Public and Private Interests in Standards Setting: Conflict or Converge*, *in* THE STANDARDS EDGE: FUTURE GENERATION 117 (Bolin, Sherrie ed., 2005).
6. Grindley, Peter C. & Teece, David J., *Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics*, *in* ESSAYS IN TECHNOLOGY MANAGEMENT AND POLICY: SELECTED PAPERS OF DAVID J. TEECE 204 (Teece, David J. ed., 2003).
7. Hounshell, David A., *The Evolution of Industrial Research in the United States*, *in* ENGINES OF INNOVATION: U. S. INDUSTRIAL RESEARCH AT THE END OF AN ERA 13 (Rosenbloom, Richard S. & Spencer, William J. ed., 1996).
8. Marks, Roger B. & Hebner, Robert E., *Government/Industry Interactions in the Global Standards System, in* THE STANDARDS EDGE: DYNAMIC TENSION 103 (Bolin, Sherrie ed., 2004)
9. Russell, Andrew L., *Constructing Legitimacy: The W3C's Patent Policy*, *in* OPENING STANDARDS: THE GLOBAL POLITICS OF INTEROPERABILITY 159 (DeNardis, Laura ed., 2011).
10. Russell, Andrew L., *Industrial Legislatures: The American System of Standardization*, *in* INTERNATIONAL STANDARDIZATION AS A STRATEGIC TOOL: COMMENDED PAPERS FROM THE IEC CENTENARY CHALLENGE 2006 70 (Int'l Elec. Comm'n ed., 2006).
11. Russell, Andrew L., *Standardization in History: A Review Essay with an Eye to the Future*, *in* THE STANDARDS EDGE: FUTURE GENERATION 247 (Bolin, Sherrie ed., 2005).
12. Schill, Charles F., *Chapter 20. Section 337 Litigation Strategies*, *in* PATENT LITIGATION STRATEGIES HANDBOOK 719 (Grossman, Barry L. & Hoffman, Gary M. ed., 2010).
13. Tate, Jay, *National Variety of Standardization*, *in* VARIETY OF CAPITALISM: THE INSTITUTIONAL FOUNDATIONS OF COMPARATIVE ADVANTAGE 442 (Hall, Peter A. & Soskice, David ed., 2001).
14. Toth, Robert B., *The U.S. Standardization System: A New Perspective, in* STANDARDIZATION ESSENTIALS: PRINCIPLES AND PRACTICE 131 (Spivak, Steven M. & Brenner, F. Cecil ed., 2001).

15. White, David & Keith, John, *Operating Policies and Procedures- Engineering a Process for Standards Setting Success*, *in* THE STANDARDS EDGE: FUTURE GENERATION 387 (Bolin, Sherrie ed., 2005).

C. Journals

1. Amundson, Steven M., *Recent Decisions Provide Some Clarity on How Courts and Government Agencies Will Likely Resolve Issues Involvings Standard-Essential Patents*, 13 CHI.-KENT J. INTELL. PROP. 91 (2013).
2. An, Baisheng, *Intellectual Property Rights in Information and Communications Technology Standardization High-Profile Disputes and Potential for Collaboration Between the United States and China*, 45 TEX. INT'L L.J. 175 (2009).
3. Biddle, Brad, Curci, Frank X., Haslach, Timothy F., Marchant, Gary E., Askland, Andrew & Gaudet, Lyn, *The Expanding Role and Importance of Standards in the Information and Communications Technology Industry*, 52 JURIMETRICS J. 177 (2012).
4. Contreras, Jorge L., *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, 53 JURIMETRICS J. 164 (2013).
5. Chappatte, Philippe, *FRAND Commitments-the Case for Antitrust Intervention*, 5(2) EUR. COMPETITION J. 319 (2009).
6. Cotter, Thomas F., *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151 (2009).
7. Daidj, Nabyla, Grazia, Cristina & Hammoudi, Abdelhakim, *Introduction to the Non-Cooperative Approach to Coalition Formation: The Case of the Blu-Ray/HD-DVD Standards' War*, 23(4) J. MEDIA ECON. 192 (2010).
8. Egan, Michelle, *Setting Standards: Strategic Advantages in International Trade*, 13(1) BUS. STRATEGY REV. 51 (2002).
9. Farrell, Joseph, Hayes, John, Shapiro, Carl & Sullivan, Theresa, *Standard Setting, Patents and Hold-Up*, 74 ANTITRUST L.J. 603 (2007).
10. Gao, Xudong & Liu, Jianxin, *Reprint of: Catching up through the Development of Technology Standard: The Case of TD-SCDMA in China*, 36(10-11) TELECOMM. POL'Y 817 (2012).
11. Gilbert, Richard J., *Deal or No Deal? Licensing Negotiations in Standard-Setting Organizations*, 77 Antitrust L.J. 855 (2011).
12. Guzman, Andrew, *The Case for International Antitrust*, 22 BERKELEY J. INT'L LAW 355 (2004).
13. Gandal, Neil, Salant, David, & Waverman, Leonard, *Standards in Wireless Telephone Networks*, 27(5,6) TELECOMM. POL'Y 325 (2003).
14. Gibson, Christopher S., *Globalization and the Technology Standards Game: Balancing Concerns of Protectionism and Intellectual Property in International Standards*, 22 BERKELEY TECH. L.J. 1403 (2007).
15. Hein, Jonas, *The Recent DOJ and FTC Policy Suggestions for Standard Setting Organizations- The Way out of Standard-essential Patent Hold-up?* 2(2) J. INTELL. PROP. & ENT. L. 339 (2013).
16. Hemphill, Thomas A., *Technology Standards-setting in the US Wireless Telecommunications Industry: A Study of Three Generations of Digital Standards Development*, 26(1) TELEMATICS & INFORMATICS 103 (2009).
17. Howell, Thomas R., Wolff, Alan Wm., Howe, Rachel & Oh, Diane, *China's New Antimonopoly Law*, 18(1) PAC. RIM L. & POL'Y J. 53 (2009).
18. Kwak, Jooyoung, Lee, Heejin & Chung, Do Bum, *The Evolution of Alliance Structure in China's Mobile Telecommunication Industry and Implications for International Standardization*, 36(10-11) TELECOMM. POL'Y 966 (2012).
19. Kshetri, Nir, Palvia, Prashant & Dai, Hua, *Chinese Institutions and Standardization: The Case of Government Support to Domestic Third Generation Cellular Standard*, 35(5) TELECOMM. POL'Y 399 (2011).

20. Kennedy, Scott, *The Political Economy of Standards Coalitions: Explaining China's Involvement in High-Tech Standards Wars*, 2 ASIA POL'Y 41 (2006).
21. Liu, Han-Wei, *International Standards in Flux: A Balkanized ICT Standard-setting Paradigm and Its Implications for the WTO*, 17(3) J. INT'L ECON. L. 551 (2014).
22. Lichtman, Doug, *Understanding the RAND Commitment*, 47 HOUS. L. REV. 1023 (2010).
23. Layne-Farrar, Anne, Padilla, A. Jorge & Schmalensee, Richard, *Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments*, 74 ANTITRUST L.J. 671 (2007).
24. Lemley, Mark A., *Ten Things to Do about Potent Holdup of Standards (and One Not to)*, 48 BOSTON COLL. L. REV. 149 (2007).
25. Lemley, Mark A. & Shapiro, Carl, *Patent Hold-up and Royalty Stacking*, 85 TEX. L. REV. 1991 (2007).
26. Lemley, Mark A. & Weiser, Philip J., *Should Property or Liability Rules Govern Information?* 85 TEX. L. REV. 783 (2007).
27. Lemley, Mark A., *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L.REV. 1889 (2002).
28. Michel, Suzanne, *Bargaining for RAND Royalties in the Shadow of Patent Remedies Law*, 77 ANTITRUST L.J. 889 (2011).
29. Merges, Robert P., *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293 (1996).
30. Ohana, Gil, Hansen, Marc & Shah, Omar, *Disclosure and Negotiation of Licensing Terms Prior to Adoption of Industry Standards: Preventing Another Patent Ambush?* 24(12) EUR. COMPETITION L. REV., 644 (2003).
31. Pelkmans, Jacques, *The GSM standard: explaining a success story*, 8(3) J. EUROPEAN PUB. POL'Y 432 (2001).
32. Posner, Richard A., *Antitrust in the New Economy*, 68, ANTITRUST L.J. 925 (2001).
33. Ratliff, James D. & Rubinfeld, Daniel L., *The Use and Threat of Injunctions in the RAND Context*, 9(1) J. COMPETITION L. & ECON. 1 (2013).
34. Ruikka, Timo, *"FRAND" Undertakings in Standardization- a Business Perspective*, 43 LES NOUVELLES 188 (2008).
35. Sokol, D. Daniel & Zheng, Wentong, *FRAND in China*, 22 TEX. INTELL. PROP. L. J. 71 (2013).
36. Strauss, Peter L., *Private Standards Organizations and Public Law*, 22 WM. & MARY BILL RTS. J. 497 (2013).
37. Suarez, Christopher A., *Look before You "Lock": Standards, Tipping, and the Future of Patent Misuse after Princo*, 13 COLUM. SCI. & TECH. L. REV. 371 (2012).
38. Sun, Wenxiang, Peng, Jisheng & Huang, Yong, *Evolution of Technology Policies in China: A Comparative Analysis between Central and Local Levels*, 2(3) J. SCI & TECH. POL'Y IN CHINA 238 (2011).
39. Shapiro, Carl, *Injunctions, Hold-Up, and Patent Royalties*, 12(2) AM. L. & ECON. REV. 280 (2010).
40. Shapiro, Carl, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 INNOVATION POL'Y & THE ECON. 119 (2001).
41. Sun, Wenxiang, Peng, Jisheng, Ma, Juelin & Zhong, Weiguo, *Evolution and Performance of Chinese Technology Policy: An Empirical Study Based on "Market in Exchange for Technology" Strategy*, 4(3) J. TECH. MGMT. IN CHINA 195 (2009).
42. Sun, Hailong & Yao, Jianjun, *A Comparative Study of System of Patent Preliminary Injunction in China and United States,* 3 CHINA PAT. & TRADEMARKS 28 (2008).
43. Tilson, David & Lyytinen, Kalle, *The 3G Transition: Changes in the US Wireless Industry*, 30(10-11) TELECOMM. POL'Y 569 (2006).
44. Tiebout, Charles M., *A Pure Theory of Local Expenditures*, 64(5) J. POL. ECON. 416 (1956).

45. Vialle, Pierre, Song, Junjie & Zhang, Jian, *Competing with Dominant Global Standards in a Catching-up Context. The Case of Mobile Standards in China,* Telecommunications Policy, 36(10-11) TELECOMM. POL'Y 832 (2012).
46. Winn, Jane K., *Globalization and Standards: The Logic of Two-Level Games*, 5 I/S: J. L. & POL'Y FOR THE INFO. SOC'Y 185 (2009).
47. Wright, Joshua D., *Antitrust Analysis of Category Management: Conwood Co. V. United States Tobacco*, 19 SUP. CT. ECON. REV. 311 (2009).
48. Wolf, Tyler R.T., *Existing in a Legal Limbo: The Precarious Legal Position of Standards-Development Organizations*, 65 WASH. & LEE L. REV. 807 (2008).
49. Werle, Raymund & Iversen, Eric J., *Promoting Legitimacy in Technical Standardization*, 2 SCI., TECH. & INNOVATION STUDIES 19 (2006).
50. Xia, Jun, *China's Telecommunications Industry in the Era of 3G and beyond: Market, Technology, and Institutions*, 36 TELECOMM. POL'Y 793 (2012).
51. Zhang, Guangliang, *Enforcement of F/RAND and Antitrust Intervention: Discussion from the Huawei Decisions in China*, 6(2) CHINA LEGAL SCI. 3 (2014).
52. Zhang, Liguo, *How IPR Policies of Telecommunication Standard-setting Organizations can Effectively Address the Patent Ambush Problem*, 41 INT'L REV. INTELL. PROP. & COMPETITION L., 380 (2010).
53. Zimmerman, Alan & Chaudhry, Peggy E., *Protecting Intellectual Property Rights: The Special Case of China*, 10 J. ASIA-PAC. BUS. 308 (2009).
54. Zhao, Chaoyi & Graham, John M., *The PRC's Evolving Standards System: Institutions and Strategy*, 2 ASIA POL'Y 63 (2006).

D. Reports

1. BREZNITZ, DAN & MURPHREE, MICHAEL, U.S.-CHINA ECON. & SEC. REVIEW COMM., THE RISE OF CHINA IN TECHNOLOGY STANDARDS: NEW NORMS IN OLD INSTITUTIONS (2013), *available at* http://origin.www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf (last visit date: Sep. 27, 2014).
2. BEKKERS, RUDI & UPDEGROVE, ANDREW, U.S. NAT'L ACAD. OF SCI., BD. OF SCI., TECH., & ECON. POLICY (STEP), A STUDY OF IPR POLICIES AND PRACTICES OF A REPRESENTATIVE GROUP OF STANDARDS SETTING ORGANIZATIONS WORLDWIDE (2012), *available at* http://home.tm.tue.nl/rbekkers/nas/Bekkers_Updegrove_NAS2012_main_report.pdf (last visit date: Sep. 28, 2014).
3. CONTRERAS, JORGE L., NAT'L INST. OF STANDARD & TECH., AN EMPIRICAL STUDY OF THE EFFECTS OF EX ANTE LICENSING DISCLOSURE POLICIES ON THE DEVELOPMENT OF VOLUNTARY TECHNICAL STANDARDS (2011), *available at* http://www.ftc.gov/opp/workshops/standards/exantereport.pdf (last visit date: May 29, 2013).
4. CHINA MINISTRY OF COMMERCE DEP'T OF WTO AFFAIRS, BACKGROUND PAPER FOR CHINESE SUBMISSION TO WTO ON INTELLECTUAL PROPERTY RIGHT ISSUES IN STANDARDIZATION (G/TBT/W/251) (2006), *available at* http://sms.mofcom.gov.cn/article/cbw/200606/20060602564485.shtml (last visit date: Sep. 28, 2014).
5. HUANG, CHIN-HAO, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S SOFT POWER IN EAST ASIA: A QUEST FOR STATUS AND INFLUENCE? (2013).
6. MASKUS, KEITH, MERRILL, STEPHEN A., COMM. ON INTELLECTUAL PROP. MGMT. IN STANDARD-SETTING PROCESSES, BD. ON SCI., TECH. & ECON. POLICY, POLICY & GLOBAL AFFAIRS, & NAT'L RESEARCH COUNCIL, PATENT CHALLENGES FOR STANDARD-SETTING IN THE GLOBAL ECONOMY: LESSONS FROM INFORMATION AND COMMUNICATION TECHNOLOGY (2013).

7. NAT'L BUREAU OF ASIAN RESEARCH, THE IP COMMISSION REPORT: THE REPORT OF THE COMMISSION ON THE THEFT OF AMERICAN INTELLECTUAL PROPERTY (2013), *available at* http://www.ipcommission.org/report/IP_Commission_Report_052213.pdf (last visit date: Sep. 28, 2014).
8. SUTTMEIER, RICHARD P., NAT'L BUREAU OF ASIAN RESEARCH, INTELLECTUAL PROPERTY AND TECHNOLOGY STANDARDS IN CHINA (2012).
9. SUTTMEIER, RICHARD P. & YAO, XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S IP TRANSITION: RETHINKING INTELLECTUAL PROPERTY RIGHTS IN RISING CHINA (2011).
10. SUTTMEIER, RICHARD P., YAO, XIANGKUI & TAN, ALEX ZIXIANG, NAT'L BUREAU OF ASIAN RESEARCH, STANDARDS OF POWER? TECHNOLOGY, INSTITUTIONS, AND POLITICS IN THE DEVELOPMENT OF CHINA'S NATIONAL STANDARDS STRATEGY (2006).
11. SUTTMEIER, RICHARD P. & YAO, XIANGKUI, NAT'L BUREAU OF ASIAN RESEARCH, CHINA'S POST-WTO TECHNOLOGY POLICY: STANDARDS, SOFTWARE, AND THE CHANGING NATURE OF TECHNO-NATIONALISM (2004).
12. U.S. TRADE REPRESENTATIVE, 2014 SPECIAL 301 REPORT (2014), *available at* http://www.ustr.gov/sites/default/files/USTR%202014%20Special%20301%20Report%20to%20Congress%20FINAL.pdf (last visit date: Sep. 28, 2014).
13. U.S. CHAMBER OF COMMERCE, CHINA'S WTO IMPLEMENTATION AND OTHER ISSUES OF IMPORTANCE TO AMERICAN BUSINESS IN THE U.S.-CHINA COMMERCIAL RELATIONSHIP (2005) *available at* https://www.uschamber.com/sites/default/files/legacy/reports/050914_wto.pdf (last visit date: Sep. 28, 2014).

E. Unpublished, Forthcoming Sources

1. An, Baisheng, *The Global Governance of Standardization: The Challenges of Convergence* (Indiana Univ. RCCPB Working Paper No. 32, 2012), *available at* https://www.indiana.edu/~rccpb/wordpress/wp-content/uploads/2015/11/An_RCCPB_32_Standards_Nov_2012.pdf (last visit date: May 24, 2016).
2. Am. Nat'l Standards Inst., *Overview of the US Standardization System* (2010), *available at* http://publicaa.ansi.org/sites/apdl/Documents/News%20and%20Publications/Brochures/U.S.StandardsSystemOverview_Third_Edition.pdf (last visit date: Sep. 28, 2014).
3. Am. Nat'l Standards Inst., *United States Standards Strategy* (2005), *available at* http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/NSSC/USSS_Third_edition/USSS%202010-sm.pdf (last visit date: Sep. 28, 2014).
4. Baron, Justus & Spulber, Daniel F., *Technology Standards and Standards Organizations: Introduction to the Searle Center Database* (2015), available at http://www.law.northwestern.edu/research-faculty/searlecenter/innovationeconomics/documents/Baron_Spulber_Searle%20Center_Database.pdf (last visit date: Apr. 22, 2016).
5. Brooks, Roger G. & Geradin, Damien, *Interpreting and Enforcing the Voluntary FRAND Commitment* (2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1645878 (last visit date: Sep. 28, 2014).
6. Contreras, Jorge L., *So That's What RAND Means? A Brief Report on the Findings of Fact and Conclusions of Law in Microsoft v. Motorola* (2013), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2259135 (last visit date: Sep. 28, 2014).
7. Chien, Colleen, Gilbert, Richard J., Shapiro, Carl, Cotter, Thomas F., Fusco, Stefania, Ghosh, Shubha, Goldman, Eric, Burk, Dan L., Cahoy, Daniel R., Carrier, Michael A., Contreras, Jorge L., Miller, Joseph Scott, Risch, Michael, Schultz, Jason, Sichelman, Ted M., Rai, Arti K., Strandburg,

Katherine J., Zimmerman, Esther Van & Sheppard, Christal, *Rand Patents and Exclusion Orders: Submission of 19 Economics and Law Professors to the International Trade Commission* (July 9, 2012), *available at* http://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1436&context=facpubs (last visit date: Sep. 28, 2014).
8. Chiao, Benjamin, Lerner, Josh & Tirole, Jean, *The Rules of Standard Setting Organizations: An Empirical Analysis* (Harvard NOM Research Paper No. 05-05, 2005), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=664643 (last visit date: Sep. 28, 2014).
9. Goodman, David J. & Myers, Robert A., *3G Cellular Standards and Patents* (2005), *available at* http://eeweb.poly.edu/dgoodman/wirelesscom2005.pdf (last visit date: Sep. 28, 2014).
10. Marti, Will & Manole, Vlad, *China's Emergence as the Workshop of the World* (Stanford Ctr. for Int'l Dev., Working Paper No. 216, 2004) *available at* http://web.stanford.edu/group/siepr/cgi-bin/siepr/?q=system/files/shared/pubs/papers/pdf/SCID216.pdf (last visit date: Sep. 28, 2014).
11. Russell, Andrew L., *The American System: A Schumpeterian History of Standardization* (Progress & Freedom Found. Progress on Point Paper No. 14.4, 2007), *available at* http://ssrn.com/abstract=975259 (last visit date: Feb. 2, 2016).
12. U.S. Dep't of Justice, *Statement of the Department of Justice's Antitrust Division on Its Decision to Close Its Investigations of Google Inc.'s Acquisition of Motorola Mobility Holdings Inc. and the Acquisitions of Certain Patents by Apple Inc., Microsoft Corp. and Research in Motion LTD.,* Feb. 13, 2012*, available at* http://www.justice.gov/atr/public/press_releases/2012/280190.htm (last visit date: Sep. 28, 2014).
13. Wang, Ping, *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* (E.-W. Ctr. Working Papers, Econ. Series, No. 117, 2011), *available at* http://www.eastwestcenter.org/publications/brief-history-standards-and-standardization-organizations-chinese-perspective (last visit date: Feb. 2, 2016).
14. Winn, Jane K., *US and EU Regulatory Competition and Authentication Standards in Electronic Commerce* (2006), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=901324 (last visit date: Sep. 28, 2014).

F. Judicial Decisions

1. Apple Inc. v. Motorola, Inc., 110 U.S.P.Q.2D 1695 (Fed. Cir. Apr. 25, 2014)
2. Apple, Inc. v. Motorola Mobility, Inc., 869 F.Supp.2d 901 (N.D. Ill., 2012)
3. Apple, Inc. v. Motorola Mobility, Inc., 886 F. Supp. 2d 1061 (W.D. Wis. 2012)
4. Apple, Inc. v. Motorola Mobility, Inc., Slip Copy, 2011 WL 7324582 (W.D. Wis. June 07, 2011)
5. Broadcom Corp. v. Qualcomm, Inc., 501 F.3d, 297 (3rd Cir. 2007)
6. Bonito Boats v. Thunder Craft Boats, 489 U.S. 141 (U.S. 1989)
7. Commonwealth Sci. & Indus. Research Organization v. Cisco Sys., 809 F.3d 1295 (Fed. Cir. 2015)
8. CSU, L.L.C. v. Xerox Corp. (In re Independent Serv. Orgs. Antitrust Litig.), 203 F.3d 1322 (Fed. Cir. 2000)
9. Ericsson, Inc. v. D-Link Sys., 2014 U.S. App. LEXIS 22778 (Fed. Cir. Dec. 4, 2014)
10. Ericsson Inc. v. D-Link Sys., 2013 U.S. Dist. LEXIS 110585 (E.D. Tex. Aug. 6, 2013)
11. eBay, Inc. v. MercExchange, L.L.C., 547 U.S. 388 (2006)
12. Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116 (1970)
13. Hynix Semiconductor, Inc. v. Rambus, Inc., 609 F. Supp. 2d 988 (N.D. Cal. 2009)
14. In re Innovatio IP Ventures, LLC, 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Sept. 27, 2013)
15. In re Fischer, 421 F.3d 1365 (Fed. Cir. 2005)
16. Image Tech. Serv. v. Eastman Kodak Co., 125 F.3d 1195 (9th Cir. Cal. 1997)

17. Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301 (Fed. Cir. 2009)
18. Microsoft Corp. v. Motorola, Inc., 795 F.3d 1024 (9th Cir. Wash. 2015)
19. Microsoft Corp. v. Motorola, Inc., 2013 U.S. Dist. LEXIS 60233, WL 2111217 (W.D. Wash. Apr. 25, 2013)
20. Microsoft Corp. v. Motorola, Inc., 2012 WL 5993202 (W.D. Wash. Nov. 30, 2012)
21. Microsoft Corp. v. Motorola, Inc., 2012 U.S. Dist. LEXIS 170587 (W.D. Wash. Nov. 29, 2012).
22. Microsoft Corp. v. Motorola, Inc., 2012 WL 2030098 (W.D. Wash. Jun. 6, 2012)
23. Microsoft Corp. v. Motorola, Inc., 2012 WL 627989 (W.D. Wash. 2012)
24. Microsoft Corp. v. Motorola, Inc., 871 F. Supp. 2d 1089 (W.D. Wash. 2012)
25. Microsoft Corp. v. Motorola, Inc., 696 F.3d 872 (9th Cir. Wash. 2012)
26. Monsanto Co. v. McFarling, 488 F.3d 973 (Fed. Cir. 2007)
27. MercExchange, L.L.C. v. eBay, Inc., 401 F.3d 1323 (Fed. Cir. 2005)
28. NYNEX Corp. v. Discon, Inc., 525 U.S. 128 (1998)
29. Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 575 F.2d 1152 (6th Cir. Mich. 1978)
30. Realtek Semiconductor Corp. v. LSI Corp., 946 F. Supp. 2d 998 (N.D. Cal. 2013)
31. Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008)
32. Research in Motion Ltd. v. Motorola, Inc., 644 F. Supp. 2d 788 (N.D. Tex. 2008)
33. Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538 (Fed. Cir. 1995)
34. Spansion, Inc. v. ITC, 629 F.3d 1331 (Fed. Cir. 2010)
35. Smith Int'l, Inc. v. Hughes Tool Co., 718 F.2d 1573 (Fed. Cir. 1983)
36. Tool Works Inc. v. Indep. Ink, Inc., 126 S. Ct. 1281 (U.S. 2006)
37. United States v. Socony-Vacuum Oil Co., 310 U.S. 150 (U.S. 1940)
38. Qualcomm Inc. v. Broadcom, Corp., 548 F.3d 1004 (Fed. Cir. 2008)

G. Legislations

1. National Technology Transfer and Advancement Act of 1995, Pub. L. No. 104–113, 110 Stat. 775 (1996).
2. Standards Development Organization Advancement Act of 2004, Pub. L. No. 108–237, 118 Stat. 661 (2004).

H. Administrative Decisions, Regulations, Guidelines

1. 2006 FTC LEXIS 60 (F.T.C. Aug. 2, 2006)
2. Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., to Michael A. Lindsay, Dorsey & Whitney LLP (2007), *available at* http://www.justice.gov/atr/public/busreview/222978.pdf (last visit date: Sep. 28, 2014).
3. Business Review Letter from Thomas O. Barnett, Assistant Att'y Gen., to Robert A. Skitol, Drinker, Biddle & Reath, LLP (2006), available at http://www.justice.gov/atr/public/busreview/219380.pdf (last visit date: Sep. 28, 2014).
4. Complaint, *In re Union Oil Co. of Cal.*, p.1, No. 9305 (F.T.C. Mar. 4, 2003), *available at* http://www.ftc.gov/sites/default/files/documents/cases/2003/03/030304unocaladmincmplt.pdf (last visit date: April 16, 2015).
5. Decision and order, In re Union Oil Co. of Cal., No. 9305 (F.T.C. July 27, 2005), *available at* http://www.ftc.gov/sites/default/files/documents/cases/2005/08/050802do.pdf (last visit date: April 16, 2015).
6. FED. TRADE COMM'N & U.S. DEP'T OF JUSTICE, ANTITRUST GUIDELINES FOR COLLABORATIONS AMONG COMPETITORS (2000).

7. In re Dell, 121 F.T.C. 616 (1996) (No. C-3658), *available at* http://www.ftc.gov/system/files/documents/cases/960617dellconsentorder.pdf (last visit date: April 16, 2015).
8. OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, OMB CIRCULAR NO. A-119, FEDERAL PARTICIPATION IN THE DEVELOPMENT AND USE OF VOLUNTARY CONSENSUS STANDARDS AND IN CONFORMITY ASSESSMENT ACTIVITIES (1998).
9. THE U.S. TRADE REPRESENTATIVE, EXEC. OFFICE OF THE PRESIDENT, DISAPPROVAL OF THE U.S. INTERNATIONAL TRADE COMMISSION'S DETERMINATION IN THE MATTER OF CERTAIN ELECTRONIC DEVICES, INCLUDING WIRELESS COMMUNICATION DEVICES, PORTABLE MUSIC AND DATA PROCESSING DEVICES, AND TABLET COMPUTERS, INVESTIGATION NO. 337-TA-7941 (2013), *available at* https://ustr.gov/sites/default/files/08032013%20Letter_1.PDF (last visit date: April 16, 2015).
10. U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS (2013).
11. U.S. FED. TRADE COMM'N, THIRD PARTY UNITED STATES FEDERAL TRADE COMMISSION'S STATEMENT ON THE PUBLIC INTEREST (2012), *available at* https://www.ftc.gov/sites/default/files/documents/advocacy_documents/ftc-comment-united-states-international-trade-commission-concerning-certain-wireless-communication/1206ftcwirelesscom.pdf (last visit date: April 16, 2015).
12. U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION (2007).
13. U.S. DEP'T OF COMMERCE, STANDARDS AND COMPETITIVENESS: COORDINATING FOR RESULTS (2004).
14. U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY (1995).

I. Official Websites

1. AM. NAT'L STANDARDS INST., PRC STANDARD SYSTEM: KEY ORGANIZATIONS, *available at* http://www.standardsportal.org/usa_en/prc_standards_system/key_organizations.aspx (last visit date: Feb. 28, 2016).
2. AM. NAT'L STANDARDS INST., 1918-2008 ANSI: A HISTORICAL OVERVIEW, *available at* *http://www.ansi.org/about_ansi/introduction/history.aspx?menuid=1* (last visit date: Apr. 22, 2016).
3. AM. NAT'L STANDARDS INST., OVERVIEW OF THE U.S. STANDARDIZATION SYSTEM, *available at* http://www.standardsportal.org/usa_en/standards_system.aspx (last visit date: Apr. 22, 2016).
4. SECONDED EUROPEAN STANDARDIZATION EXPERT IN CHINA, CHINESE STANDARDS, *available at* http://www.sesec.eu/chinese-standards/(last visit date: Feb. 28, 2016).
5. TELECOMM. DEV. INDUS. ALLIANCE, ABOUT US, *available at* http://www.tdia.cn/en/about.asp (last visit date: Apr. 4, 2016).

J. Blogs

1. Wang, Ping, *On Standardization in China*, TALKSTANDARDS (Aug. 16, 2010, 6:00 pm), http://www.talkstandards.com/on-standardization-in-china/.
2. Wang, Ping, *CNIS Role in Chinese Standardization*, TALKSTANDARDS (Aug. 16, 2010, 6:00 pm), http://www.talkstandards.com/cnis-role-in-chinese-standardization/.

K. Lectures

1. Ohlhausen, Maureen K., Commissioner, Fed. Trade Comm'n, Address at the 9th International Conference on Standardization and Innovation in Information Technology (Oct. 6, 2015).

II. Chinese Documents

A. Books

1. BEIJINGSHI ZHISHICHANQUAN JU (北京市知识产权局) [BEIJING INTELLECTUAL PROPERTY OFFICE], ZHUANLI JIUFEN ANJIAN PINGXI (专利纠纷案件评析)[ANALYZING PATENT DISPUTE CASES] (2005).
2. GAO, JUNGUANG (高俊光), MIANXIANG JISHU CHUANGXIN DE JISHU BIAOZHUN XINGCHENG JILI (面向技术创新的技术标准形成机理) [THE MECHANISM OF TECHNOLOGY STANDARDIZATION UNDER TECHNOLOGY INNOVATION] (2010).
3. KUANG, BING (邝兵), BIAOZHUNHUA ZHANLUE DE LILUN YU SHIJIAN YANJIU (标准化战略的理论与实践研究) [STUDY ON THE THEORY AND PRACTICE OF THE STANDARDIZATION STRATEGY) (2011).
4. LIU, KONGZHONG (LIU KUNG-CHUNG 劉孔中), JIEGO ZHICAI FA JI QI YU JINGZHENG FA DE CHONGTU YU TIAOHE (解構智財法及其與競爭法的衝突與調和) [DECIPHERING IP LAW AND ITS CONFLICT/RECONCILIATION WITH COMPETITION LAW] (2015).
5. LIANG, LITAO (梁丽涛), FAZHAN ZHONG DE BIAOZHUNHUA (发展中的标准化) [EVOLVING STANDARDIZATION] (2013).
6. LIU, CHUNQING ET AL. (刘春青等), MEIGUO YINGGUO DEGUO RIBEN HE ELUOSI BIAOZHUNHUA GAILUN (美国, 英国, 德国, 日本和俄罗斯标准化概论) [INTRODUCTION TO STANDARDIZATION IN THE U.S., ENGLAND, GERMAN, JAPAN, AND RUSSIA] (2012).
7. LI, CHUNTIAN (李春田), XIANDAI BIAOZHUNHUA FANGFA: ZONGHE BIAOZHUNHUA (现代标准化方法:综合标准化) [METHODS TO CURRENT STANDARDIZATION: INTEGRATION STANDARDIZATION] (2011).
8. LI, YUJIAN (李玉剑), ZHUANLI LIANMENG: ZHANLUE LIANMENG YANJIU DE XINLINGYU (专利联盟: 战略联盟研究的新领域) [PATENT ALLIANCE: NEW AREA OF STRATEGIC ALLIANCE RESEARCH] (2006).
9. MA, HAISHENG (马海生), ZHUANLI XUKE DE YUANZE: GONGPING, HELI, WUQISHI XUKE YANJIU (专利许可的原则: 公平, 合理, 无歧视许可研究) [PRINCIPLE OF PATENT LICENSE: RESEARCH ON FAIR, REASONABLE, AND NON-DISCRIMINATORY LICENSE] (2010).
10. NIU, RUI (牛睿), FANLONGDUANFA WENTI YANJIU (反垄断法问题研究) [RESEARCH ON ANTI-MONOPOLY ACT QUESTION] (2010).
11. QIU, HAN (裘涵), JISHU BIAOZHUNHUA YANJIU XINSLUN (技术标准化研究新论) [A NEW INTERPRETATION OF TECHNOLOGY STANDARDIZATION] (2011).
12. SUN, YAOWU (孙耀吾), GAOJISHU QIYE JISHU CHUANGXIN WANGLUO- JIYU JISHU BIAOZHUNHUA DE YANJIU (高技术企业技术创新网络-基于技术标准化的研究) [TECHNOLOGY INNOVATION NETWORK OF HIGH-TECH ENTERPRISE- RESEARCH BASED ON TECHNOLOGY STANDARDIZATION] (2008).
13. WANG, JIANG (万江), ZHONGGUO FANLONGDUAN FA (中国反垄断法) [CHINA COMPETITION LAW] (2015).
14. WANG, YIYI ET AL. (王益谊等), BIAOZHUN SHEJI ZHUANLI DE CHUZHI GUIZE (标准涉及专利的处置规则) [DISPOSAL RULES FOR THE INCLUSION OF PATENTS IN STANDARDS] (2014).
15. WANG, XIAOYE (王晓晔), FANLONGDUAN FA (反垄断法) (ANTI-MONOPOLY LAW) (2011).
16. WU, TAIXUAN (吴太轩), JISHU BIAOZHUNHUA DE FANLONGDUANFA GUIZHI (技术标准化的反垄断法规制) [ANTI-MONOPOLY REGULATION ON TECHNOLOGY STANDARDIZATION] (2011).
17. WANG, XINGYUN & ZHENG, YANXIN (王兴运 & 郑艳馨), JINGZHENGFAXUE(竞争法学) [COMPETITION LAW] (2010).
18. WANG, ZHONGMIN (王忠敏), BIAOZHUNHUA JICHU ZHISHI SHIYONG JIAOCHENG (标准化基础知识实用教程) [PRACTICAL MATERIAL OF THE FUNDAMENTAL KNOWLEDGE TO STANDARDIZATION] (2010).
19. XI, WEIMING (郗伟明), JINGJI QUANQIUHUA XIA ZHONGGUO FANLONGDUAN ZHIFA ZHUANTI YANJIU (经济全球化下中国反垄断执法专题研究) [RESEARCH OF CHINA'S ANTI-MONOPOLY ENFORCEMENT UNDER ECONOMIC GLOBALIZATION] (2010).

20. YIN, XINTIAN (尹新天), ZHONGGUO ZHUANLI FA XIANGJIE (中国专利法详解) [INTRODUCTION TO THE PATENT LAW OF CHINA] (2011).
21. YUE, GAOFENG (岳高峰), BIAOZHUN TIXI LILUN YU SHIWU (标准体系理论与实务) [THEORY AND PRACTICE OF STANDARD SYSTEM] (2011).
22. ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2013 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2013 中国标准化发展研究报告) [2013 CHINA STANDARDIZATION DEVELOPMENT REPORT] (2014).
23. ZHISHICHANQUAN CHUBANSHE (知识产权出版社) [INTELLECTUAL PROPERTY PUBLISHING HOUSE], ZHUANLI FA JI ZHUANLI FA SHISHI XIZE (专利法及专利法实施细则) [PATENT LAW AND IMPLEMENTATION RULES OF PATENT LAW] (2013).
24. ZHANG, JIHONG(张继宏), ZHUANLI BIAOZHUNHUA MUBIAO DE JICHENG CHUANGXIN- LILUN, ZENGJU YU DUICE (专利标准化目标的集成创新-理论,证据与对策) [INTEGRATED INNOVATION IN THE GOALS OF PATENT STANDARDIZATION- THEORY, EVIDENCE, AND STRATEGY] (2011).
25. ZHANG, PING (张平), CHONGTU YU GONGYING: JISHU BIAOZHUN ZHONG DE SIQUAN BAOHU, XINXI CHANYE JISHU BIAOZHUN DE ZHISHICHANQUAN ZHENGCE FENXI (冲突与共赢:技术标准中的私权保护,信息产业技术标准的知识产权政策分析) [CONFLICT AND MUTUAL BENEFIT: PRIVATE RIGHTS PROTECTION IN STANDARDIZATION, INTELLECTUAL PROPERTY POLICY ANALYSIS OF TECHNOLOGY STANDARD IN INFORMATION INDUSTRY] (2011).
26. ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], 2009 ZHONGGUO BIAOZHUNHUA FAZHAN YANJIU BAOGAO (2009 中国标准化发展研究报告) [2009 CHINA STANDARDIZATION DEVELOPMENT REPORT] (2010).
27. ZHU, GUOHUA (朱国华), GAOXIN JISHU CHANYEHUA DE ZHUANLI, BIAOZHUN YU RENCAI ZHANLUE (高新技术产业化的专利,标准与人才战略) [STRATEGY OF PATENT, STANDARD, AND COMPETENT PERSON IN HIGH-TECH INDUSTRIALIZATION] (2010).
28. ZHANG, YOUMING (张友明), BIAOZHUNHUA ZONGHE GONGXIAN DE KEXUE PINGGU FANGFA (标准化综合贡献的科学评估方法) [SCIENTIFIC EVALUATION METHOD TO SYNTHETIC CONTRIBUTION OF STANDARDIZATION] (2009).
29. ZHONGGUO BIAOZHUNHUA YANJIUYUAN (中国标准化研究院) [CHINA NAT'L INST. OF STANDARDIZATION], ZHONGGUO BIAOZHUNHUA ZHANLUE YANJIU (中国标准化战略研究) [RESEARCH ON CHINA'S STANDARDIZATION STRATEGY] (2007).

B. Collections

1. Li, Chuntian (李春田), Diyizhang Xulun (第一章绪论) [Chapter 1 Introduction], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 1 (Li, Chuntian (李春田) et al. eds., 6th ed. 2014).
2. Xuan, Xiang (宣湘), Diqizhang Jishu Biaozhun (第七章技术标准) [Chapter 7 Technology Standard], in BIAOZHUNHUA GAILUN (标准化概论) [INTRODUCTION TO STANDARDIZATION] 103 (Li, Chuntian (李春田) et al. eds., 6th ed. 2014).

C. Journals

1. Deng, Zhisong & Dai, Jianmin (邓志松&戴健民), *Jianxi Lanyong Biaozhun Biyao Zhuanli de Xingwei Leixing: Yi Gaotong An Wei Shijiao* (简析滥用标准必要专利的行为类型: 以高通案为视角) [*Analyzing the Conduct Categories of Abusing Standard-essential-patents: Case Study of Qualcomm*], ZHONGGUO JIAGE JIANGUAN YU FANLONGDUAN (中国价格监管与反垄断) [PRICE SUPERVISION & ANTI-MONOPOLY IN CHINA], no.8, 2014, at 38.

2. Deng, Zhuo(邓卓), *Lun Woguo Zhishichanquan Jinling Zhidu de Wanshan* (论我国知识产权禁令制度的完善) [*On Perfection of IP Injunction of China*], ZHISHICHANQUAN (知识产权) [INTELL. PROP.], no.9, 2013, at 47.
3. Fang, Qing & Yu, Xinli (房庆&于欣丽), *Zhongguo Biaozhunhua de Lishi Yange ji Fazhan Fangxiang* (中国标准化的历史沿革及发展方向) [*The History and the Development Trend of China's Standardization*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.3, 2003, at 4.
4. Gu, Ping & Zhang, Hongbin (顾萍&张宏斌), *Biaozhun Biyao Zhuanli xia de XiangGuan Shangpin Shichang Jieding Fangfa ji Shichang Zhipei Diwei Rending de Kaoliang Yinsu* (标准必要专利下的相关商品市场界定方法及市场支配地位认定的考量因素) [*Factors to Decide Relevant Market and Market Dominance of Standard-Essential-Patents*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.12, 2013, at 27.
5. Gu, Mengjie (顾孟洁), *Zhongguo Biaozhunhua Fazhanshi Xintan* (中国标准化发展史新探) [*Discussion on the Development History of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.3, 2001, at 7.
6. Hu, Hong (胡洪), *Sifa Shiye xia de FRAND Yuanze- JianPing Huawei Su IDC An* (司法视野下的 FRAND 原则- 兼评华为诉 IDC 案) [*Analysis of the Principle of FRAND from Judicial Perspective Review of Huawei v. IDC Case*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 884.
7. Han, Chuan & Yin, Fenglin (韩伟&尹锋林), *Biaozhun Biyao Zhuanli Chiyouren de* Shichang Diwei Rending (标准必要专利持有人的市场地位认定) [*Determining Market Dominance of Standard-Essential-Patent Holders*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.3, 2014, at 33.
8. Li, Jiang et al. (李江等), *Zhongguo Zhuanli Moshi Xuke Shijian Tanjiu* (中国专利默示许可实践探究) [*Probing into Practice Relevant to Implied Patent License in China*], ZHONGGUO ZHUANLI YU SHANGBIAO (中国专利与商标) [CHINA PATENTS & TRADEMARKS], no.4, 2014, at 67.
9. Li, Yang & Liu, Ying (李扬&刘影), *FRAND Biaozhun Biyao Zhuanli Xuke Shiyongfei de Jisuan- Yi Zhongmei Xiangguan Anjian Bijiao wei Shijiao* (FRAND 标准必要专利许可使用费的计算- 以中美相关案件比较为视角) [*The Calculation of FRAND SEPs Licensing Royalty: A Comparison of Related Cases in China and U.S.A*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.5, 2014, at 866.
10. Liu, Qiang, Shen, Lihua & Ma, Deshuai (刘强, 沈立华, 马德帅), *Woguo Zhuanli Qinquan Sunhai Peichang Shue Shizheng Yanjiu* (我国专利侵权损害赔偿数额实证研究) [*Empirical Study of the Patent Infringement Damage in China*], WULING XUEKAN (武陵学刊) [J. WULING], no.5, 2014, at 78.
11. Liu, Yunyun (刘筠筠), *Zhuanli Qinquan Sunhai Peichang Wenti de Tansuo yu Bijiao Yanjiu* (专利侵权损害赔偿问题的探索与比较研究) [*Exploration and Comparative Study of Patent Infringement Damage*], SHANGYE SHIDAI (商业时代) [COM. TIMES], no.14, 2014, at 124.
12. Liu, Yuanshan, Yu, Xiubao & Li, Chuanwen (刘远山, 余秀宝, 李伟文), *Woguo Zhuanli Qinquan Sunhai Peichange Jisuan Fangfa Shiyong Lunyao* (我国专利侵权损害赔偿额计算方法适用论要) [*Some Mainly Discusses about the Applicable of Calculation Methods of Patent Infringement Damages*], XINGZHENG YU FA (行政与法) [PUB. ADMIN. & LAW], no.1, 2011, at 115.
13. Qi, Li(齐力), 2014 *Nian Fanlongduan Diyian: Diaocha Gaotong* (2014 年反垄断第一案:调查高通) [*The First Antimonopoly Case in 2014: Investigating Qualcomm*], ZHONGGUO DUIWAI MAOYI (中国对外贸易) [CHINA'S FOREIGN TRADE], no.3, 2014, at 52.
14. Ren, Airong (任爱荣), *Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei Guizhi de Chubu Tansuo* (滥用知识产权排除、限制竞争行为规制的初步探索) [*Preliminary Discussion of*

the Provisions Prohibiting the Abuse of Intellectual Property Rights to Preclude or Restrict Competition], KEJI YU FALV (科技与法律) [J. SCI. TECH. & LAW], no.4, 2013, at 1.
15. Shi, Shaohua (史少华), *Biaozhun Biyao Zhuanli Susong Yinfa de Sikao- FRAND Yuanze yu Jinling* (标准必要专利诉讼引发的思考 FRAND 原则与禁令) [*Considerations Caused by Standard-essential-patent Litigations- FRAND Rule and Injunction*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.1, 2014, at 76.
16. Wang, Xianlin (王先林), *Sheji Zhuanli de Biaozhun Zhiding he Shishi zhong de Fanlongduan Wenti* (涉及专利的标准制定和实施中的反垄断问题) [*Anti-monopoly Issues in the Setting and Enforcement of Standard Related to Patent*], FAXUEJIA (法学家) [JURIST], no.4, 2015, at 62.
17. Wang, Lihui(王丽慧), *Gong Si Quan Boyi haishi Ronghe: Biaozhun Biyao Zhuanli yu Fanlongduanfa de Hudong* (公私权博弈还是融合: 标准必要专利与反垄断法的互动) [*Competing or Converging of Public and Private Rights: Interaction of Standard-essential-patents and Anti-monopoly Law*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.9, 2014, at 30.
18. Wang, Xiaoye (王晓晔), *Shichang Zhipei Diwei de Rending- Dui Huawei Su IDC Yian de Kanfa* (市场支配地位的认定 -对华为诉 IDC 一案的看法) [*Determining Market Dominance- Opinion on Huawei v. IDC*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 17.
19. Wang, Ping & Liang, Zheng (王平&梁正), *Woguo Xiehui he Lianmeng de Biaozhunhua Fazhan Yanjiu* (我国协会和联盟的标准化发展研究) [*Study on Evolution of Standardization in National Associations and Alliances*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.8, 2013, at 59.
20. Wang, Xianlin (王先林), *Woguo Fanlongduanfa Shiyong yu Zhishichanquan Lingyu de Zaisikao* (我国反垄断法适用于知识产权领域的再思考) [*Rethinking the Application of China's Antimonopoly Law in the Area of Intellectual Property Rights*], NANJING DAXUE XUEBAO (南京大学学报) [J. NANJING UNIV.], no.1, 2013, at 34.
21. Wang, Ping, Wang, Yiyi & Hill, John (王平, 王益谊, 约翰希尔), *Zhongguo de Biaozhunhua Zhanlue Chengjiu yu Tiaozhan* (中国的标准化战略－成就与挑战) [*Standardization Strategy of China – Achievements and Challenges*], BIAOZHUN KEXUE (标准科学) [STANDARD SCIENCE], no.5, 2010, at 4.
22. Wang, Ping (王平), *Zhongguo Biaozhunhua Liushi Nian Huigu* (中国标准化六十年回顾) [*Review the Sixty Years of Chinese Standardization*], BIAOZHUN SHENGHUO (标准生活) [STANDARD LIVING], no.10, 2009, at 22.
23. Wang, Zhongmin (王忠敏), *Lun Zhongguo Biaozhunhua Guanli San Jieduan* (论中国标准化管理三阶段) [*Discussing the Three Phases of Chinese Standardization Administration*], SHIJIE BIAOZHUNHUA YU ZHILIANG GUANLI (世界标准化与质量管理) [WORLD STANDARDIZATION & QUALITY MGMT.], no.4, 2004, at 9.
24. Wang, Zhongmin (王忠敏), *Zhongguo Biaozhunhua de Lishi Diwei ji Weilai* (中国标准化的历史地位及未来) [*Historical Position and Future of Chinese Standardization*], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.12, 2003, at 6.
25. Wu, Nengfu (吴能夫), *Zhongguo Biaozhunhua de Lishi Yuanyuan* (中国标准化的历史渊源) [History of Chinese Standardization], ZHONGGUO BIAOZHUNHUA (中国标准化) [CHINA STANDARDIZATION], no.5, 2002, at 52.
26. Xie, Guanbin & Jiao, Shan (谢冠斌&焦姗), *Jianxi Zhongguo Dui Zhishichanquan Lanyong de Fanlongduan Guizhi Qushi- Ping Gaotong Gongsi Shexian de Zhishichanquan Lanyong Xingwei* (简析中国对知识产权滥用的反垄断规制趋势-评高通公司涉嫌的知识产权滥用行为) [*Analyzing the Tendency of China's Anti-monopoly Regulation on Abusing Intellectual Property- Commenting*

Qualcomm's Involved Conduct of Abusing Intellectual Property], ZHONGGUO JIAGE JIANGUAN YU FANLONGDUAN (中国价格监管与反垄断) [PRICE SUPERVISION & ANTI-MONOPOLY IN CHINA], no.8, 2014, at 35.
27. Xue, Lin (薛林), *Lun Zhuanli Qinquan Jiuji zhong de Tingzhi Qinhai Zhidu* (论专利侵权救济中的停止侵害制度) [*Cessation of Infringement in Patent Law System*], ZHONGGONG YINCHUAN SHIWEI DANGXIAO XUEBAO (中共银川市委党校学报), [J. YINCHUAN MUN. PARTY C. C.P.C], no.4, 2011, at 71.
28. Xu, Jianchu (须建楚), *Zhishichanquan Shenpan zhong Jinling de Shiyong* (知识产权审判中禁令的适用) [*Applying Injunction in Intellectual Property Trials*], KEJI YU FALÜ (科技与法律) [J. SCI. TECH. & LAW], no.4, 2003, at 46.
29. Yang, Xiaoli (杨晓丽), *Zhongguo Guojia Biaozhun Sheji Zhuanli de ChuZhi Guize Pingjia shang* (中国国家标准涉及专利的处置规则评价(上)) [*Evaluating the Disposal Rules for the Inclusion of Patents in National Standards in China (First Half Part)*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.8, 2014, at 62.
30. Ye, Ruosi, Zhu, Jianjun & Chen, Wenquan (叶若思,祝建军,陈文全), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan de Rending- Ping Huawei Gongsi Su Meiguo IDC Gongsi Longduan Jiufen An* (标准必要专利权人滥用市场支配地位构成垄断的认定-评华为公司诉美国 IDC 公司垄断纠纷案) [*Determining Monopolization when Standard-essential-patent Holders Abuse their Market Dominance – Commenting the Huawei v. IDC Monopoly Dispute*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.3, 2013, at 46.
31. Yi, Jiming (易继明), *Jinzhi Quanli Lanyong Yuanze zai Zhishichanquan Lingyu zhong de Shiyong* (禁止权利滥用原则在知识产权领域中的适用) [*The Application of the Principle of the Prohibition of Abuse of Rights in the Field of Intellectual Property*], ZHONGGUO FAXUE (中国法学) [CHINA LEGAL SCI.], no.4, 2013, at 39.
32. Yin, Zongping (殷宗萍), *Zhuanli Qinquan Sunhai Peichang de Lifa ji Sifa Shijian Yanjiu- Cong Zhongguo yu Meiguo Bijiao de Shijiao* (专利侵权损害赔偿的立法及司法实践研究- 从中国与美国比较的视角) [*Legislative and Judicial Research of Patent Infringement Damage- China and United States Comparison*], ZHONGGUO GAOXIN JISHU QIYE (中国高新技术企业) [CHINA HIGH-TECH ENTERPRISES], no.27, 2012, at 145.
33. Zhong, Chun (仲春), *Biaozhun Biyao Zhuanli Jinling Lanyong de Guizhi- Anquangang Yuanze ji Qita* (标准必要专利禁令滥用的规制-安全港原则及其他) [*Regulation of Standard-essential-patent Injunction Abusing- Safe Harbor Rule et al*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.9, 2014, at 22.
34. Zhu, Jianjun (祝建军), *Biaozhun Biyao Zhuanliquanren Lanyong Shichang Zhipei Diwei Goucheng Longduan* (标准必要专利权人滥用市场支配地位构成垄断) [*Monopolization when Standard-essential-patent Holders Abuse their Market Dominance*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 10.
35. Zhu, Jianjun & Chen, Wenquan (祝建军&陈文全), *Biaozhun Biyao Zhuanli Shiyong Feilü Jiofen Juyou Kesuxing* (标准必要专利使用费率纠纷具有可诉性) [*Standard-essential-patent License Dispute Has Suability*], RENMIN SIFA (人民司法) [PEOPLE'S JUDICATURE], no.4, 2014, at 4.
36. Zhang, Ping (张平), *Lun Sheji Jishu Biaozhun Zhuanli Qinquan Jiuji de Xianzhi* (论涉及技术标准专利侵权救济的限制) [*Restraint of Remedy when Patents Incorporated into Standards*], KEJI YU FALÜ 科技与法律 [SCI. TECH. & LAW], no.5, 2013, at 69.
37. Zhang, Xuehong (张雪红), *Biaozhun Biyao Zhuanli Jinling Jiuji Zhengce zhi Gaige* (标准必要专利禁令救济政策之改革) [*Reforming the Policy of Standard-essential-patent Injunction*], DIANZI ZHISHI CHANQUAN (电子知识产权) [ELECTRONICS INTELL. PROP.], no.12, 2013, at 32.

38. Zheng, Wenyan(郑文艳), *Zhongguo Zhuanli Qinquan Sunhai Peichang Guiding de Lishi Huigu he Fazhan Jianyi* (中国专利侵权损害赔偿规定的历史回顾和发展建议) [*The History Review of and Development Suggestion on China's Patent Damage Provisions*], FAZHI YU SHEHUI (法制与社会) [LEGAL SYS. & SOC'Y], no.6, 2009, at 349, 349.

D. Judicial Decisions, Interpretations

1. Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 305 号) [No. 305 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 16, 2013).
2. Huawei Jishu Youxian Gongsi Su Jiaohu Shuzi Jishu Gonsi Deng (华为技术有限公司诉交互数字技术公司等) [Huawei Tech. Ltd. v. InterDigital Tech. Corp. et al] ((2013)粤高法民三终字第 306 号) [No. 306 (2013) of the Guangdong High People's Court] (Guangdong High People's Ct. Oct. 21, 2013).
3. Ji Qiang yu Liu Hui Su Chaoyang Xingnuo Jianzhu Gongcheng Youxian Gongsi (季强与刘辉诉朝阳兴诺建筑工程有限公司)[Ji Qiang, Liu Hui v. Chaoyang Xingnuo Constr. Ltd.] (最高人民法院(2008)民三他字第 4 号) [No. 4 (2008) of the Supreme People's Court) (Sup. People's Ct. Jul. 8, 2008).
4. Tianjin Gangwan Gongcheng Yanjiusuo Su Zonghe Kancha Yanjiu Shejiyuan (天津港湾工程研究所诉综合勘察研究设计院) [Tianjin Harbour Engineering Research Institute v. Comprehensive Institute of Geotechnical Investigation & Surveying] ((1996)二中知初字第 49 号)[No. 49 (1996) of the Beijing No.2 Intermediate People's Court](Beijing No.2 Interm. People's Ct. Feb. 18, 1997).
5. Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (最高人民法院(2012)民提字第 125 号) [No. 125 (2012) of the Supreme People's Court] (Sup. People's Ct. Jan. 2, 2014).
6. Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (河北省高级人民法院(2011)冀民三终字第 15 号) [No. 15 (2011) of the Hebei High People's Court] (Hebei High People's Ct. Mar. 21, 2011).
7. Zhang Jingting Su Hengshui Ziyahe Jianzhu Gongcheng Youxian Gongsi (张晶廷诉衡水子牙河建筑工程有限公司) [Zhang Jingting v. Hengshui Ziyahe Constr. Ltd.] (河北省石家庄市中级人民法院(2009)石民五初字第 00163 号) [No. 163 (2009) of the Hebei Shijiazhuang Intermediate People's Court] (Hebei Shijiazhuang Interm. People's Ct. Dec. 10, 2010).
8. Zuigao Renmin Fayuan Guanyu Shenli Qinfan Zhuanliquan Jiufen Anjian Yingyong Falv Ruogan Wenti de Jieshi Er Zhengqiu Yijian Gao (最高人民法院关于审理侵犯专利权纠纷案件应用法律若干问题的解释(二)(征求意见稿)) [Interpretation of the Supreme People's Court on Several Issues concerning the Application of Law in the Trial of Patent Infringement Dispute Cases (Part Two)(Draft for Asking Comments)], http://www.hfiplaw.cn/?p=2809 (China).

E. Legislations

1. Fanlongduan Fa (反垄断法) [Antimonopoly Law] (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 30, 2007, effective Aug. 1, 2008) 2007 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 517 (China).
2. Zhonghua Renmin Gongheguo Zhuanli Fa Xiuding Caoan Songshen Gao (中华人民共和国专利法修订草案(送审稿)) [Drafted Amendment of Patent Law of People's Republic of China (Draft for

Approval)], http://www.chinalaw.gov.cn/article/cazjgg/201512/20151200479591.shtml (China).

3. Zhuanli Fa (专利法) [Patent Law] (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008, effective Oct. 1, 2009) 2009 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 27 (China).
4. Zhonghua Renmin Gongheguo Biaozhunhua Fa (中华人民共和国标准化法) [Standardization Law of the People's Republic of China] (promulgated by the Standing Comm. Nat'l People's Cong., Dec.29, 1988, effective Apr. 1, 1989) 1988 STANDING COMM. NAT'L PEOPLE'S CONG. GAZ. 867 (China).

F. Administrative Decisions, Regulations, Guidelines

1. Guowuyuan Bangongting Guanyu Yinfa Guanche Shishi Shenhua Biaozhunhua Gongzuo Gaige Fangan Xingdong Jihua (2015-2016 Nian) de Tongzhi (国务院办公厅关于印发贯彻实施<深化标准化工作改革方案>行动计划(2015-2016 年)的通知) [Notice of the General Office of the State Council on Issuing the Action Plan to Implement <Deepen Standardization Reform> (Year 2015-2016)] (promulgated by the State Council Aug. 30 2015) ST. COUNCIL GAZ., Sep. 30, 2015, at 18 (China).
2. Guojia Gongshang Xingzheng Guanli Zongju Guanyu Jinzhi Lanyong Zhishichanquan Paichu Xianzhi Jingzheng Xingwei de Guiding (国家工商行政管理总局关于禁止滥用知识产权排除、限制竞争行为的规定) [Provisions of the State Administration for Industry and Commerce on Prohibiting the Abuse of Intellectual Property Rights to Preclude or Restrict Competition] (promulgated by the St. Admin. Indus. & Com., Apr. 7, 2015, effective Aug. 1, 2015) ST. COUNCIL GAZ., Jun. 20, 2015, at 11 (China).
3. Guowuyuan Guanyu Yinfa Shenhua Biaozhunhua Gongzuo Gaige de Tongzhi (国务院关于印发深化标准化工作改革的通知) [Notice of the State Council on Issuing Deepen Standardization Reform] (promulgated by the State Council Mar. 11 2015) ST. COUNCIL GAZ., Apr. 10, 2015, at 17 (China).
4. Gaotong Gongsi Feifa Longduan An (高通公司非法垄断案) [In re Qualcomm Inc. Unlawful Antimonopoly] (发改办价监处罚[2015] 1 号) [No. 1 [2015] of the National Development and Reform Commission] (Nat'l Dev. & Reform Comm'n Feb. 9, 2015).
5. Guojia Biaozhun Sheji Zhuanli de Guanli Guiding (国家标准涉及专利的管理规定 (暂行))[Regulatory Measures on National Standards Involving Patents (Interim)] (promulgated by the Standardization Admin. China & St. Intell. Prop. Off., Dec. 19, 2013, effective Jan. 1, 2014), http://www.sipo.gov.cn/zcfg/flfg/zl/bmgfxwj/201401/t20140103_894910.html (China).
6. Guanyu Lanyong Zhishichanquan de Fanlongduan Zhinan Zhengqiu Yijian Gao (关于滥用知识产权的反垄断指南(征求意见稿)) [Antimonopoly Guidelines for the Abuse of Intellectual Property Rights (Draft for Asking Comments)], http://www.sdpc.gov.cn/gzdt/201512/t20151231_770313.html (China).

G. Official Websites

1. CHINA ASS'N FOR STANDARDIZATION, ABOUT CAS, *available at* http://www.china-cas.org/xhjj.jhtml (last visit date: Feb. 28, 2016).
2. CHINA NAT'L INST. OF STANDARDIZATION, ABOUT CNIS, *available at* http://en.cnis.gov.cn/bzygk/kyly/ (last visit date: Feb. 28, 2016).
3. CHINA ACAD. OF INFO. COMMC'N & TECH., INTRODUCTION, *available at* http://www.catr.cn/yw/intro/201305/t20130522_923241.htm (last visit date: Apr. 4, 2016).

H. Lectures

1. Liu, Jian, Deputy Director, Nat'l Dev. & Reform Comm'n, Address at the International Symposium on Legal Reforms in Standard Essential Patents Context (Nov. 18, 2015).
2. Wang, Bin, Director, Huawei Tech., Address at the International Symposium on Legal Reforms in Standard Essential Patents Context (Nov. 18, 2015).